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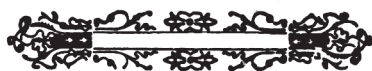
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por el

DR. LUIS RAZETTI

Organo de la Academia Nacional de Medicina
y del Congreso Venezolano de Ciencias Médicas



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Álvaro Barrios-Núñez

Investigación Innovadora en Psicología Clínica y Salud III

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Álvaro Barrios-Núñez

Innovative Research in Clinical and Health Psychology III

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La GMC considerará contribuciones para las siguientes secciones:

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Los trabajos enviados deberán cumplir con los requisitos que se describen a continuación.

EDITORIALES

Esta sección estará dedicada al análisis y la reflexión sobre los problemas de salud de la población, los distintos enfoques preventivos y terapéuticos, así como los avances logrados en el campo de la investigación biomédica y otros que considere la Dirección-Redacción.

ARTÍCULOS ORIGINALES

Deberán contener en la página frontal, el título conciso e informativo del trabajo; nombre(s) y apellido(s) de cada autor; grados académicos de los autores e institución en la cual se realizó el trabajo; nombre y dirección actual del autor responsable de la correspondencia; un título corto de no más de 40 caracteres (contando espacios y letras) y las palabras clave.

Los trabajos originales, revisiones sistemáticas y metanálisis deben tener un resumen estructurado, como se indica a continuación:

Debe contener un máximo de 250 palabras, y los siguientes segmentos:

- Introducción: ¿Cuál es el problema principal que motivó el estudio?
- Objetivo: ¿Cuál es el propósito del estudio?
- Métodos: ¿Cómo se realizó el estudio? (selección de la muestra, métodos analíticos y observacionales).
- Resultados: ¿Cuáles son los aspectos más importantes? (datos concretos y en lo posible su significancia estadística)
- Conclusión: ¿Cuál es la más importante que responde al objetivo?

Al final se anotarán 3 a 6 palabras clave.

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Resumen en inglés

Debe corresponderse con el resumen en español. Se sugiere que este sea revisado por un traductor experimentado, a fin de garantizar la calidad del mismo.

Introducción

Incluir los antecedentes, el planteamiento del problema y el objetivo del estudio en una redacción libre y continua debidamente sustentada por la bibliografía.

Método

Señalar claramente las características de la muestra, el o los métodos empleados con las referencias pertinentes, de forma que se permita a otros investigadores, realizar estudios similares.

Resultados

Incluir los hallazgos importantes del estudio, comparándolos con las figuras estrictamente necesarias y que amplíen la información vertida en el texto.

Discusión

Relacionar los resultados con lo reportado en la literatura y con los objetivos e hipótesis planteados en el trabajo.

Conclusión

Describir lo más relevante que responda al objetivo del estudio.

Agradecimientos

En esta sección se describirán los agradecimientos a personas e instituciones así como los financiamientos.

Referencias

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Indicarlas con números arábigos entre paréntesis en forma correlativa y en el orden en que aparecen por primera vez en el texto, cuadros y pie de las figuras. En las citas de revistas con múltiples autores (más de seis autores), se deberá incluir únicamente los 6 primeros autores del trabajo, seguido de et al.,

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En las microfotografías deberá aparecer la ampliación microscópica o una barra de micras de referencia.

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Son aquellas contribuciones que por su importancia el Comité Redactor considere su inclusión en esta categoría.

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Deberán constar de resumen en español e inglés (máximo 100 palabras) en formato libre. Constará de introducción, presentación del caso, discusión, ilustraciones y referencias, con una extensión máxima de 10 cuartillas y apegadas a las instrucciones a los autores.

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En esta sección se incluirán los artículos relacionados con aspectos históricos, filosóficos, bases conceptuales y éticas de la medicina. Aunque su estructura se dejará a criterio del autor, deberá incluir resúmenes en español e inglés (máximo 100 palabras) en formato libre, referencias bibliográficas citadas en el texto y en listadas al final del

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Se informará sobre los avances y descubrimientos terapéuticos más recientes aparecidos en la literatura nacional e internacional y su aplicación en nuestro ámbito médico. La extensión máxima será de cuatro cuartillas y con un máximo de cinco referencias bibliográficas. Deberá incluir resúmenes en español en inglés, en formato libre (máximo 100 palabras).

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Se plantearán los aspectos éticos del ejercicio profesional y aquellos relacionados con los avances de la investigación biomédica y sus aplicaciones preventivas y terapéuticas. Su extensión máxima será de cuatro cuartillas y cuatro referencias bibliográficas, deberá incluir resúmenes en español e inglés (máximo 100 palabras) en formato libre.

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Esta sección estará dedicada a contribuciones tendientes a informar al médico acerca de las disposiciones legales, riesgos y omisiones de la práctica profesional que puedan conducir a enfrentar problemas legales. Su máxima extensión será de cuatro cuartillas y no más de cinco referencias bibliográficas. Deberá incluir resúmenes en español e inglés (máximo 100 palabras).

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Innovative Research in Clinical and Health Psychology III

Introduction to the supplement

Alvaro Barrios-Núñez¹

Clinical and Health Psychology generate considerable pragmatic and methodological benefits that improve the mental health of the population.

Clinical Psychology emphasizes the evaluation, prediction, and alleviation of cognitive, emotional, and behavioral psychological affectations, while Health Psychology focuses its actions on health promotion, providing health education, developing studies and interventions on variables attitudinal, motivational, and emotional factors associated with health and quality of life, the promotion of healthy habits and lifestyles, as well as the learning of habits that favor health.

The National Academy of Medicine of Venezuela, interested in studying in-depth phenomena that affect human mental health from a biopsychosocial model, took the initiative to publish this third supplement of the *Gaceta Medica de Caracas* dedicated to innovative research in Clinical Psychology and Health. We are especially grateful for the invitation of the

Board of Directors of the Academy and the Editor-in-Chief, Dr. Enrique Lopez-Loyo, to prepare this supplement, as well as the great support received from the Senior Editor, Dr. Anita Stern Israel.

The supplement has 22 articles, of which 16 are original and 6 are reviews, 86 % written in English, prepared by researchers from Latin America, Asia, and Europe, specialists in multiple areas of knowledge, mostly Social Sciences and medicine. The National Academy of Medicine of Venezuela and the *Gaceta Medica de Caracas* deeply thank the authors who participated in this call, highlighting the dedication and quality in the generation of new knowledge that allows the dissemination of scientific contributions in the international academic community.

Among the works related to Health Psychology, the following stand out: Consumption of psychoactive substances, mental health and sexual behaviors as risk factors in the health of Colombian children and adolescents by Barrera-Mesa et al.; Caregiving and parenting practices during mandatory confinement by COVID-19 of early childhood caregivers by Arguello-Muñoz et al.; Perception of the benefits of pet companionship during the COVID-19 quarantine in a population sample from the city of Medellin, Colombia by Klimenko et al.; Internalized and externalized problems in preschool and emotional state of caregivers during the COVID-19 pandemic: a longitudinal study by Herazo Chamorro et al.; Perceived self-efficacy

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EDITORIAL

and its relationship with the perception of the characteristics of remote work in a pandemic situation in a sample of Colombian primary, secondary and university basic education teachers from Armendariz-Nuñez et al.; Lifestyle and mental health in conditions of the COVID-19 pandemic in a sample of people from the city of Medellin, Colombia by Hernandez-Florez et al.; Family functioning and self-harm behaviors in adolescents and young people in the municipality of Valledupar Colombia by Cudris-Torres et al.; Attitudes about infectious and contagious diseases in the Colombian population of Vinaccia; Effect of workload, work shift, and job stress on burnout of general practitioners at Makassar Regional General Hospital during the COVID-19 pandemic by Suharni et al.; Video game use disorder and aggressive behavior in secondary school adolescents by Estrada-Araoz et al.; Effect of workload and work environment on the anxiety of health workers in dealing with patients with tuberculosis by Rezki et al.; Paradox of obesity and cardiovascular risk by Torres Quezada et al.; Emotions, anxiety, depression and the immune system: an integrative view of psychoneuroimmunology from a meta-analytic

review of the narrative by Hernandez-Florez et al., and Conceptualizations of informal care and its contribution to the visibility of the caregiver by Garcia-Cantillo et al.

The manuscripts related to Clinical Psychology focus on topics such as Autism spectrum problems, attention deficit, anxious symptoms, and IQ in children from 2 to 5 years of age by Vergara Alvarez et al.; Psychotherapeutic treatments in patients with bipolar and schizoaffective disorders by Hernandez-Florez et al.; Effect of Cognitive Behavioral Therapy on the behavior of patients with cardiovascular disease by Israfil et al.

The Gaceta Medica de Caracas and the National Academy of Medicine hope that the understanding and dissemination of these manuscripts, which are the generation of new knowledge, will emphasize the innovations that have emerged in recent years related to the fields of Clinical and Health Psychology, in such a way so that more interventions can be developed that minimize the impact on mental health that multiple phenomena and social scourges cause to human beings.

Investigaciones Innovadoras en Psicología Clínica y de la Salud III

Introducción al suplemento

Álvaro Barrios-Núñez

La Psicología Clínica y de la Salud generan beneficios pragmáticos y metodológicos considerables que mejoran la salud mental de la población.

La Psicología Clínica hace énfasis en la evaluación, predicción y alivio de afectaciones psicológicas de tipo cognitivas, emocionales y comportamentales, mientras que la Psicología de la Salud enfoca sus acciones a la promoción de la salud, haciendo educación sanitaria, desarrollando estudios e intervenciones sobre variables actitudinales, motivacionales y emocionales asociadas con la salud y la calidad de vida, el fomento de hábitos y estilos de vida saludables, así como el aprendizaje de hábitos favorecedores de la salud.

La Academia Nacional de Medicina de Venezuela, interesada en estudiar a profundidad fenómenos que afectan la salud mental del ser humano desde un modelo biopsicosocial, asumió la iniciativa de publicar este tercer suplemento de la Gaceta Médica de Caracas dedicado a investigaciones innovadoras en Psicología

Clínica y de la Salud. Agradecemos de manera especial la invitación de la Junta Directiva de la Academia y del Editor en Jefe, Dr. Enrique López-Loyo, para preparar este suplemento, así como el gran apoyo recibido de parte de la Editora Senior, Dra. Anita Stern Israel.

El suplemento cuenta con 22 artículos, de los cuales 16 son originales y 6 son de revisión, escritos en inglés en un 86 %, elaborados por investigadores de América Latina, Asia y Europa, especialistas en múltiples áreas de conocimientos mayoritariamente de las Ciencias Sociales y Médicas. La Academia Nacional de Medicina de Venezuela y la Gaceta Médica de Caracas, agradecen profundamente a los autores que participaron de esta convocatoria, destacando la dedicación y calidad en la generación de nuevo conocimiento que permite difundir aportes científicos en la comunidad académica internacional.

Dentro de los trabajos relacionados con Psicología de la Salud se destacan los siguientes: Consumo de sustancias psicoactivas, salud mental y comportamientos sexuales como factores de riesgo en la salud de colombianos de Barrera-Mesa y col.; Prácticas de crianza y cuidado durante confinamiento obligatorio por COVID-19 de cuidadores de primera infancia de Arguello-Muñoz y col.; Percepción sobre los beneficios de la compañía de mascotas durante

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la cuarentena por COVID-19 en una muestra de población de la ciudad de Medellín, Colombia de Klimenko y col.; Problemas internalizados y externalizados en preescolar y estado emocional de cuidadores durante la pandemia del COVID-19: un estudio longitudinal de Herazo Chamorro y col.; Autoeficacia percibida y su relación con la percepción de las características del trabajo remoto en situación de pandemia en una muestra de docentes colombianos de educación básica primaria, secundaria y universitaria de Armendariz-Nuñez y col.; Estilo de vida y la salud mental en condiciones de pandemia de COVID-19 en una muestra de personas de la ciudad de Medellín, Colombia de Hernández-Flórez y col.; Funcionamiento familiar y conductas de autolesión en adolescentes y jóvenes del municipio de Valledupar Colombia de Cudris-Torres y col.; Actitudes sobre las enfermedades infecciosas y contagiosas en población colombiana de Vinaccia; Efecto de la carga de trabajo, el turno de trabajo y el estrés laboral en el agotamiento de los médicos generales en el Hospital General Regional de Makassar durante la pandemia de COVID-19 de Suharni y col.; Trastorno por uso de videojuegos y comportamiento agresivo en adolescentes de educación secundaria de Estrada-Araoz y col.; Efecto de la carga de trabajo y el ambiente de trabajo en la ansiedad de los trabajadores de la salud en el trato con pacientes con tuberculosis de Rezki y col.; Paradoja de la obesidad y

riesgo cardiovascular de Torres Quezada y col.; Emociones, ansiedad, depresión y sistema inmunológico: una visión integradora de la psiconeuroinmunología desde una revisión meta-analítica de la narrativa de Hernández-Flórez y col., y Conceptualizaciones del cuidado informal y su contribución a la visibilidad del cuidador de García-Cantillo y col.

Los manuscritos relacionados con Psicología Clínica se orientan en temas como: Problemas del espectro autista, déficit de atención, sintomatología ansiosa y coeficiente intelectual en niños de 2 a 5 años de Vergara Álvarez y col.; Tratamientos psicoterapéuticos en pacientes con trastornos bipolar y esquizoafectivo de Hernández-Flórez y col.; Efecto de la Terapia Cognitivo Conductual en el comportamiento de pacientes con enfermedad cardiovascular de Israfil y col.

La Gaceta Médica de Caracas y la Academia Nacional de Medicina esperan que la comprensión y difusión de estos manuscritos que son generación de nuevo conocimiento enfatizen las innovaciones que han surgido en los últimos años relacionados con los campos de Psicología Clínica y de la Salud, de tal forma que se puedan desarrollar más intervenciones que minimicen el impacto en la salud mental que múltiples fenómenos y flagelos sociales ocasionan al ser humano.

Consumption of psychoactive substances, mental health and sexual behaviors as risk factors in the health of Colombian children and adolescents

Consumo de sustancias psicoactivas, salud mental y comportamientos sexuales como factores de riesgo en la salud de niños y adolescentes colombianos

Carmen Emilce Barrera-Mesa¹, Mauricio Barrera-Mesa², Flavio Humberto Fernández-Morales^{3*}

SUMMARY

This research aims to provide precise data on risk behaviors and protective factors for the health of secondary and high school students at a Colombian educational institution. The study has a quantitative approach with a descriptive scope, a convenience sampling was carried out that took as a sample of 656 students who received authorization from their parents and agreed to answer the voluntary, anonymous, and confidential survey. The 10 modules of the Global School Health Survey (GSHS) were applied, and this article presents the results regarding the modules of tobacco use, drug use, sexual behaviors, and mental health. The results show that the consumption of psychoactive substances occurs to a greater extent in

men, that adolescents start a sexual life at an early age, and that the percentage of women who have seriously considered the possibility of suicide is higher than in men. It concludes with the need to implement support plans that reduce psychosocial risk factors in students. These plans should link various government institutions, educational institutions, and students' families to promote safe behaviors in adolescents.

Keywords: World survey of school health, consumption of psychoactive substances, mental health, sexual behavior, adolescents.

RESUMEN

El propósito de esta investigación es aportar datos precisos sobre conductas de riesgo y factores protectores para la salud de los estudiantes de educación básica secundaria y media, de una institución educativa colombiana. El estudio tiene un enfoque cuantitativo con alcance descriptivo, se realizó

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un muestreo por conveniencia que tomó como muestra 656 estudiantes quienes recibieron autorización de sus padres y accedieron a responder la encuesta de carácter voluntario, anónimo y confidencial. Se aplicaron los 10 módulos de la encuesta mundial de salud escolar (GSHS), y en este artículo se presentan los resultados referentes a los módulos de consumo de tabaco, consumo de droga, comportamientos sexuales y salud mental. Los resultados muestran que el consumo de sustancias psicoactivas se presenta en mayor medida en los hombres, que los adolescentes inician una vida sexual a temprana edad y que el porcentaje de mujeres que han considerado seriamente la posibilidad de suicidarse es mayor que el de los hombres. Se concluye con la necesidad de implementar planes de apoyo que reduzcan los factores de riesgos psicosociales en los estudiantes. Estos planes deben vincular a diversas instituciones gubernamentales, así como a las instituciones educativas y a las familias de los estudiantes, para promover comportamientos seguros en los adolescentes.

Palabras clave: Encuesta mundial de salud escolar, consumo de sustancias psicoactivas, salud mental, comportamientos sexuales, adolescentes.

INTRODUCTION

Risk behaviors are those repeated actions outside certain limits, which can divert or compromise the normal psychosocial development of a person during childhood or adolescence, with harmful repercussions for current or future life (1). Among these behaviors are addictions to substances such as alcohol, tobacco, or drugs, bad eating habits, sexual behaviors, and suicidal ideation, to mention a few (2,3).

In many countries around the world, research is being carried out to characterize the behavior of adolescents concerning these behaviors so that the state and society, in general, have accurate information to propose policies and carry out actions that allow mitigating the risks that arise from them derive (4). An example of this is the work of Guerrero-Alcedo et al. (5), which characterizes the protected sexual behaviors of Venezuelan students and the result of Arasi and Ajuwon (6), who study the same subject but in Nigerian adolescents. The risk factors and protective factors associated with a healthy lifestyle, alcohol, and tobacco consumption have

been studied in countries such as Chile, Mexico, Brazil, Lebanon, and Vietnam, to mention a few (7-11).

Although several standardized instruments measure these risk factors, one of the most popular is the global school health survey due to its wide dissemination (12). One advantage of this instrument is that it allows for comparing the behavior of populations with very different cultural, social, economic, and political characteristics, in this case of the study on passive smoking in adolescents from 63 countries (13) or the survey of physical violence and sleep disorders in adolescents from 89 countries (14).

The Global School Health Survey (GSHS) was developed by the “World Health Organization (WHO)” and the “Centers for Disease Control and Prevention (CDC)” in collaboration with UNICEF, UNESCO, and UNAIDS to provide accurate data on risk behaviors and protective factors for student health (15). The GSHS consists of ten core modules that address the leading causes of morbidity and mortality among children and adults worldwide. The modules are alcohol consumption, dietary behaviors, drug use, hygiene, mental health, physical activity, protective factors, sexual behaviors, tobacco use, violence, and unintentional injuries (16).

The WHO recommends that countries apply at least six of the 10 core modules of the questionnaire and allows country-specific questions to be added on topics of importance or unique interest. The data obtained through the GSHS survey make it possible to describe the variation in health risk behaviors and protective factors according to demographic characteristics (16). These results help guide the planning and implementation of prevention and mitigation policies and programs focused on adolescents between the ages of 13 and 17 in educational institutions. This research addresses the modules on the consumption of psychoactive substances, sexual behaviors, and mental health.

The consumption of psychoactive substances is measured through three modules in the GSHS: alcoholism, drugs, and smoking. The Alcoholism Module measures age at first alcohol consumption, current alcohol consumption, amount of alcohol consumption, how students obtain the alcohol they drink, binge drinking

episodes, and problems associated with alcohol use. The second module analyzes drug use throughout life, the age of first drug use, current drug use, and the origin of the drugs used. The smoking module measures current cigarette smoking, age of smoking initiation, everyday use of other tobacco products, attempted cigarette cessation, exposure to secondhand smoke, tobacco use by their models at continued,

The module on sexual behaviors that contribute to HIV infection, other Sexually Transmitted Infections (STIs), and unwanted pregnancies of the GSHS survey seeks to measure: the prevalence of lifetime sexual relations, age of first sexual intercourse, number of sexual partners, use of condoms, and contraceptive use. According to World Health Organization (WHO) (17), studies show that adolescents who start sexual activity at an early age are likely to have sexual relations with partners who have been at risk of exposure to HIV, and they probably do not use condoms. Likewise, young people between 15 and 24 are the most threatened group since they represent between 40 % and 50 % of those newly infected with HIV (18).

The adolescent mental health module seeks to measure feelings of loneliness, loss of sleep due to worry, suicidal ideation and attempts, and the existence of close friends. These are some factors of significant incidence worldwide for the deterioration of youth mental health. The OMS in 2009 already pointed out that approximately 20 % of children and adolescents had a disabling mental illness. Recently, various authors have affirmed that anxiety disorders, depression, other mood disorders, and cognitive and behavioral disorders are among the most common mental health problems among adolescents (19-21).

The consumption of psychoactive substances (cigarettes, drugs, and alcohol) in adolescents is a matter of great concern for today's society. The WHO (17) points out that, worldwide, alcohol consumption causes 3 % of deaths and stresses that the leading cause of death among young people between the ages of 15 and 25 is unintentional injuries, the vast majority related to alcohol consumption. Likewise, young people who drink, use tobacco and other drugs, and participate in risky sexual behaviors. These phenomena are associated with diseases such as depression,

anxiety, HIV, and STIs, which affect the youth population worldwide and, in some cases, drive adolescents to suicide.

Regarding alcohol consumption in young people, the "Pan American Health Organization (PAHO)" (22) points out that worldwide, more than a quarter of all young people between the ages of 15 and 19 are drinkers, which represents 155 million teenagers. In many countries in the Americas, Europe, and the Western Pacific, alcohol consumption begins before age 15, a situation that worsens from 20 to 24, when young people reach episodes of excessive alcohol consumption (4,6). Likewise, multilateral organizations, such as WHO, UNICEF, and PAHO, among others, show their concern that excessive alcohol consumption can harm the psychological development of adolescents and negatively influence the school environment.

Colombian adolescents are not alien to the phenomena described above. In Colombia, some research indicates that from the ages of 12 and 13, young people start using psychoactive substances (23). Likewise, an association is observed between the consumption of psychoactive substances and the presence of mental disorders in adolescence (24). Given the evidence, this research aims to provide accurate data on risk behaviors and protective factors for the health of secondary and high school students from a Colombian educational institution. In this case, the GSHS was used, and the following sections report the findings corresponding to the modules on the consumption of psychoactive substances, sexual behaviors, and mental health.

METHODS

This cross-sectional research of a quantitative type (25) presents the descriptive analysis of the data collected from a convenience sample of 656 students from a public school in Duitama - Colombia, who agreed to answer the GSHS survey voluntarily. Anonymous and confidential. Regarding the ethical considerations in the application of the GSHS survey, it is essential to mention that the process of signing the informed consent by the parents and permission by the secondary and high school students was carried

out. The sample consists of 320 students (48.8 %) female and 336 (51.2 %) males, from sixth to eleventh grade. The respondents are between 10 and 19 years old, belonging to socioeconomic stratum 1 to 3.

The survey was applied in May 2022, and the analysis was carried out using the free SPSS software version. Some variables were dichotomized to determine the prevalence of the analyzed behavior (26). Likewise, the tables discriminate the total percentage by gender and by a degree of the conditions explored in the modules studied. In addition, the analysis of bivariate relationships with the Pearson coefficient was performed to determine the association between the variables of alcohol consumption, tobacco consumption, drug consumption, sexual relations, suicidal ideation, a suicide plan, and suicide attempt.

RESULTS

The results of the modules on alcohol consumption, tobacco consumption, drug consumption, sexual behaviors, and mental health of the GSHS survey applied to adolescents from the sixth to the eleventh grade of the educational institution are detailed below. Table 1 describes the percentages corresponding to the alcohol consumption module.

Table 1 shows that 55.9 % of the students' state that they have consumed alcohol at least once in their lives; of this percentage, 24.1 % correspond to the female gender and 31.9 % to the male gender, among the adolescents who have consumed at least one alcoholic beverage, 15.5 % state that they destroyed it after their 14th birthday. In comparison, 40.4 % have ingested it before that age. The highest percentage of adolescents who consume alcohol is in ninth grade, followed by tenth and eleventh-grade students. In the alcohol consumption module, the percentage of men is higher than women, the contrary of whether they have had problems with their family due to alcohol consumption, where the female gender presents a higher percentage in the sixth and seventh grades.

40.2 % of adolescents state that they have consumed alcohol in the last thirty days, of which 14.8 % correspond to sixth-grade students between the ages of 10 and 14. Among the students surveyed, 20.1 % stated that they had consumed alcohol until they got drunk (unsteady when walking, unable to speak correctly, and sometimes vomiting). In the latter case, the highest percentage is found in ninth-grade (29.5 %) and eleventh-grade (29.5 %) students, followed by sixth-grade (15.9 %) and tenth-grade students (14.4 %).

Regarding how adolescents acquire alcohol for their consumption, there is: firstly, they purchase it in a store or on the street (10.2 %); secondly, they obtain it at home (9.9 %), and 5.6 % say they get it with their friends. Regarding alcohol consumption in the last thirty days, 3.5 % of those surveyed state that they have drunk more than 10 days a month, and 14.6 % report having had three or more drinks of alcohol per day.

Table 2 shows the percentages of the different behaviors for the tobacco consumption module. 22.9 % of students have smoked a cigarette at least once, with consumption being higher in men than in women (14 % vs. 8.8 %). Of this percentage, 16.2 % tried smoking for the first time before the age of fourteen, while 6.7 % stated that they had smoked after reaching that age. 10.7 % of students report having tried to quit smoking in the last 12 months. 14.2 % of total respondents stated that they had smoked cigarettes during the previous 30 days, the percentage of men being higher than that of women, except for the seventh grade, where the percentage of women exceeds that of men (7.5 % vs. 6.5 %).

Regarding the consumption of another form of cigarette, such as the vape or electronic cigarette, it is evident that 13.9 % of the adolescents surveyed state that they have used it in the last 30 days, presenting the highest percentages in the ninth (31.9 %), eighth grades (16.5 %) and seventh (15.4 %). Likewise, 10.7 % of those surveyed stated that they had tried to quit smoking in the last 12 months. 41.2 % of students report that other people, such as their father, mother, or legal representative, smoked in their presence in the last 7 days, as follows: 10 % of students state that their father, 1.8 % have exposed them by the

Table 1. Percentage of alcohol consumption: total, by gender, and degree.

Explored condition	T		6th		7th		8th		9th		10th		11h	
	F	M	F	M	F	M	F	M	F	M	F	M	F	M
Have you consumed alcohol at least once in your life?	55.9	24.1	5.7	8.2	5.4	7.6	6.5	8.2	10.6	13.9	6.5	10.6	8.2	8.4
Did you consume at least one alcoholic drink in the last 30 days?	40.2	17.4	4.9	9.8	6.1	6.4	5.7	8.3	12.5	13.3	7.2	10.2	6.8	8.7
Consumption of at least one alcoholic drink for the first time before age 14.	40.4	16.8	7.9	11.3	6.4	10.6	8.7	9.8	7.9	10.6	5.3	7.9	5.3	8.3
He has been drunk 1 or more times in his life.	20.1	7.5	5.3	10.6	2.3	3.8	0.8	3.8	11.4	18.2	5.3	9.1	12.1	17.4
You have had problems with family or friends, skipped school, or gotten into a fight at least once due to drinking alcohol.	10.2	4.9	6.0	3.0	9.0	6.0	6.0	6.0	14.9	23.9	7.5	7.5	4.5	6.0

Source: The authors

Table 2. Percentage of tobacco consumption: total, by gender, and by grade

Explored condition	T	6th.		7th.		8th.		9th.		10th.		11th.		
		F	M	F	M	F	M	F	M	F	M	F	M	
Students who have smoked at least one cigarette in their life	22.9	8.8	14.0	4.0	8.7	5.3	6.0	6.7	14.0	16.7	6.0	11.3	3.3	12.0
Students who tried a cigarette for the first time at 14 years.	16.2	6.3	9.9	4.7	12.3	7.5	7.5	8.5	12.3	15.1	5.7	11.3	0.9	5.7
Did you have smoked cigarettes in the last 14.2 30 days?	4.6	9.6	5.4	10.8	7.5	6.5	6.5	11.8	19.4	2.2	11.8	3.2	12.9	
Students who used other types of tobacco, such as vaping or electronic cigarettes, in the past 30 days.	13.9	5.3	8.5	4.4	7.7	8.8	7.7	8.8	15.4	16.5	1.1	11.0	1.1	11.0
Attempted to quit smoking in the last 12 months (smokers)	10.7	3.5	7.2	2.9	8.6	4.3	5.7	8.6	12.9	14.3	1.4	17.1	2.9	12.9
Other people have smoked in their presence in the last 7 days.	41.2	19.8	21.3	8.9	10.7	8.9	6.3	8.1	7.4	11.1	13.0	5.6	7.8	6.7

Source: The authors

mother and 2 % state both parents have smoked in their presence.

Table 3 presents the results of the drug use module in the adolescents surveyed. 9.5 % of them have consumed some drug (marihuana, bazuco, cocaine, LSD, or synthetic drugs) one or more times in their lives. Among those who have used drugs, the highest percentage of students is in ninth grade (37.1 %), followed by eleventh grade (16.1 %) and tenth grade (14.5 %), and the highest consumption is found in adolescents aged 13 to 18 years (67.7 %). Regarding the sixth, seventh, and eighth grades, the highest consumption is located in the seventh grade (13 %), adolescents from 11 to 14 years of age: in this grade, consumption occurs in the same proportion in both genders.

It observed that 5 % of the adolescents surveyed stated that they used some drug in the last 30 days, evidencing the highest consumption in ninth grade (42.5 %), followed by seventh grade (18.2 %) and sixth grade (15.1 %). Students who used drugs at least once stated that drug use occurred for the first time when their ages ranged from 7 to 9 years (1.2 %) and 10 to 13 years (4.4 %). And from 14 years onwards (3.8 %).

Table 4 presents the module's results on sexual behaviors that contribute to HIV infection, other STIs, and unwanted pregnancies. 20.9 % of the students who responded to the GSHS survey have had sexual intercourse at least once in their lives, the percentage being higher in men than in women (13 % vs. 7.9 %). 6.9 % of the students had sexual relations before the age of fourteen, a situation more frequent in men than in women (4.7 % vs. 2.2 %).

Among those who say they have had sexual relations, 23.9 % report not having used a condom the last time they had sexual relations. In addition, 62.3 % state that they have used some method of birth control (withdrawal, interrupted intercourse, the rhythm method or safe period, birth control pills). 11.7 % of the students surveyed stated that they had had sexual relations with two or more people throughout their lives, the percentage being higher in men than in women (7.9 % vs. 3.8 %).

Table 5 presents the results of the adolescent mental health module. 80.3 % of the students

Table 3. Drug use: total, by gender, and by degree

Explored condition	T		F		M		6th.		7th.		8th.		9th.		10th.		11th.	
	T	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	
Consumption of drugs such as Marijuana, bazuco, cocaine, LSD, or synthetic drugs one or more times in their life.	9.5	4.3	5.2	1.6	9.7	6.5	6.5	4.8	3.2	17.7	19.4	8.1	6.5	6.5	8.1	6.5	6.5	9.7
Drug use in the last 30 days.	5.0	2.6	2.4	3.0	12.1	9.1	9.1	6.1	3.0	27.3	15.2	3.0	3.0	15.2	3.0	3.0	3.0	6.1

Source: The authors

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Table 4. Sexual behaviors: total, by gender, and by grade.

Explored condition	T	6th.		7th.		8th.		9th.		10th.		11th.			
		F	M	F	M	F	M	F	M	F	M	F	M		
Have you ever had sexual intercourse?	20.9	7.9	13.0	0.7	7.3	3.6	5.1	1.5	5.8	14.6	17.5	5.1	11.7	12.4	14.6
They had their first sexual relationship before they were 14 years old.	6.9	2.1	4.7	2.2	20.0	8.9	13.3	2.2	13.3	8.9	15.6	4.4	6.7	4.0	0
You have had sexual relations with two or more people in their lifetime.	11.7	3.8	7.9	1.3	9.1	3.9	5.2	1.3	6.5	13.0	22.1	3.9	11.7	9.1	13.0
Students who used a condom the last time that they had sexual relations.	16.5	6.4	10.1	0.9	3.7	3.7	4.6	1.9	5.6	15.7	19.4	4.6	13.0	12.0	14.8
Students who used other contraceptive methods.	11.6	5.3	6.3	2.6	3.9	3.9	3.9	2.6	5.3	15.8	14.5	6.6	13.2	14.5	13.2

Source: The authors.

Table 5. Mental health in adolescents: total, by gender and grade.

Explored condition	T		6th.		7th.		8th.		9th.		10th.		11th.		
	F	M	F	M	F	M	F	M	F	M	F	M	F	M	
Students who have felt lonely in the last 12 months.	80.3	43.8	36.6	8.0	7.4	9.3	8.3	9.7	7.4	11.8	9.9	7.8	7.2	8.0	5.3
You have been so worried about something that you have been unable to sleep at night for the past 12 months.	76.7	39.9	36.7	6.6	7.4	8.5	8.3	9.9	8.2	12.1	11.1	7.2	7.4	7.8	5.6
Have you ever seriously considered the possibility of committed suicide in the past 12 months.	27.9	19.4	8.5	8.7	5.5	12.6	4.4	12.6	6.0	18.0	7.7	9.3	4.4	8.2	2.7
Have made any suicide plans in the last 12 months.	23.9	17.2	6.7	10.2	4.5	12.7	4.5	12.7	6.4	17.2	7.6	10.2	2.5	8.9	2.5
Attempted suicide one or more times in the last 12 Months.	19.1	13.7	5.3	12.8	5.6	13.6	3.2	13.6	4.8	15.2	8.8	10.4	3.2	6.4	2.4
He has no close friends.	7.2	3.8	3.4	2.1	4.3	8.5	4.3	10.6	12.8	14.9	14.9	4.3	8.5	12.8	2.1

Source: The authors.

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stated that they felt alone in the last 12 months, which is higher in women than in men (43.8 % vs. 36.6 %). Likewise, 76.7 % of the students report that in the last 12 months, they have been so worried about something that they cannot sleep at night, mainly affecting the female gender. 27.9 % of those surveyed have seriously considered the possibility of committing suicide, with a higher percentage of women compared to men (19.4 % vs. 8.5 %), a situation that occurs in all grades. Likewise, 23.9 % of adolescents state that they have made some plan to commit suicide in the last 12 months and 19.1 % report having attempted suicide at least once in the past 12 months: across all grades and behaviors in this module, the percentage of women is approximately twice that of men. 7.2 % of students feel lonely by not having any close friends.

Table 6 shows the results of the analysis of bivariate relationships using Pearson correlations, where those tests with statistical significance $p < 0.05$ were considered as relationships. It observed that the alcohol consumption variable shows a statistically significant relationship ($p = 0.0001$) with the variables: having consumed tobacco, drug consumption, and sexual relations. In the case of the relationship between the variable's suicidal ideation with a suicide plan and suicide attempt, a significantly high relationship is evident. Likewise, the variables are directly related. As alcohol consumption increases, tobacco, drug, and sexual relations increase. Likewise, as the suicidal ideation variable increases.

Table 6. Correlation between variables

		Alcohol consumption	Tobacco use	Consumption of drugs	Sexual intercourse	Suicidal ideation	Plan to commit suicide	Suicide attempt
Alcohol consumption	c.pearson	1	0.366**	0.213**	0.365**	0.155**	0.124**	0.141**
tobacco use	p. worth		0.0001	0.000	0.0001	0.0001	0.002	0.0001
	c.pearson		1	0.531**	0.479**	0.220**	0.197**	0.216**
	p. worth			0.0001	0.0001	0.0001	0.0001	0.0001
Consumption of drugs	c.pearson			1	0.424**	0.159**	0.185**	0.228**
	p. worth				0.0001	0.0001	0.0001	0.0001
Sexual intercourse	c.pearson				1	0.124**	0.116**	0.152**
	p. worth				0	0.002	0.003	0.0001
Suicidal ideation	c.pearson					1	0.734**	0.693**
	p. worth						0.0001	0.0001
Plan to commit suicide	c.pearson						1	0.729**
	p. worth							0.0001
Suicide attempt	c.pearson							1
	No.	656						

** . The correlation is significant at the 0.01 level (bilateral).

Source: Statistical analysis of SPSS package

DISCUSSION

This research provides relevant statistical data on behaviors related to the consumption of psychoactive substances, sexual behaviors,

and mental health of Colombian secondary and high school students. Likewise, it allows the generation of possible prevention strategies and attention to risk factors that affect the health of adolescents.

Regarding the alcoholism module, the results show that a high percentage (55.9 %) of those surveyed state that they have consumed alcohol at least once in their lives, a condition that occurs mainly in the male gender, with a lower percentage of students who report not have consumed alcoholic beverages. Similar findings were reported by Linetzky et al. (27), who, when applying the global school health survey to Argentine students, found that 56.8 % of those surveyed indicated having had at least one alcoholic drink in their life, results that were significantly more frequent in males than in females. These authors state that as age increases, alcohol consumption progressively increases, contrary to the present investigation, where it was found that the highest consumption occurs in ninth grade. In contrast, it tends to decrease in the tenth and eleventh grades. Although in Argentina and Colombia, the sale of alcohol to minors under 18 years of age is prohibited, in the two investigations, the students state that they quickly acquire alcoholic beverages, either in stores, on the street, at home, or through family members and friends.

The results of the tobacco consumption module show that 22.9 % of adolescents have used tobacco at least once in their lives, and 14.2 % have consumed it in the last month, which shows that tobacco consumption began at an early age. Tobacco, Similar results show the application of the GSHS survey in countries like Argentina and Chile. The “Ministerio de Salud de Chile” (28) indicates that the percentage of students who report having consumed cigarettes at some time is 50.9 %. At the same time, the “Ministerio de Salud y Desarrollo de Argentina” (29) affirms that 20.4 % of students from 13 to 17 years old consumed some tobacco product in the last 30 days. Both studies show that the percentage in women is higher than in men: Chile 38.9 % and Argentina 21.8 %; contrary to this investigation, the highest percentage of tobacco consumption occurs in men (14 %).

In the same way, the results obtained in the sexual behaviors module are relevant, in which an onset at an early age is evident. 2.7 % of the students claim to have had sexual relations before the age of 11, 1.5 % at 12, and 2.6 % at 13. In this sense, the onset of sexuality occurs in some cases before the age of fourteen, the minimum

age established by the Colombian penal code for sexual consent, which constitutes a crime. The “Instituto Colombiano de Bienestar Familiar (ICBF)” (30) points out: “Any sexual act with children and adolescents under 14 years of age is considered sexual violence and is a crime.”

The results of the mental health module showed significantly higher numbers of suicidal ideation. 27.9 % of the students surveyed state that they have seriously considered the possibility of suicide, 23.9 % have made plans to attempt suicide, and 19.1 % report having attempted suicide at least once. In addition, this situation affects women more frequently. The third world survey of school health applied in Argentina (29) yielded similar results since 21.55 % of students between the ages of 13 and 17 seriously considered the possibility of committing suicide in the last year, with more than double the percentage in women who in males. Indicates the need to establish suicide prevention plans with gender, which take into account protective factors to prevent suicidal ideation, like the psychological well-being of adolescents and their relational contexts (31,32), and which involves the development of institutional and family actors related to the well-being of adolescents (33,34).

CONCLUSIONS

The results of this study present relevant information that allows institutions to make decisions regarding the promotion and prevention plans for adolescent health. The need to implement experiential workshops for students in which thematic axes around emotional education are discussed, such as anger and depression control, treatment of suicidal behaviors, stress management, and substance use prevention, is evident. Psychoactive, responsible sexuality and other strategies contribute to improving the physical and mental health of children and adolescents.

The Global School Health Survey (GSHS) allows for collecting information of interest for the health of adolescents and identifying the main risk factors to which they are exposed. This research showed that the behaviors studied are more prevalent in ninth-grade students, so it is

essential to prioritize intervention and mitigation strategies in adolescents in this educational level and age range.

The study demonstrates the importance of establishing alternatives for sexual education in adolescents since initiating sexual relations can generate other risk factors, such as pregnancy or sexually transmitted diseases and even the commission of crimes. Likewise, it is necessary to establish prevention strategies for the consumption of psychoactive substances in adolescents that involve the family and educational institutions, to train critical and empowered adolescents against the consumption of substances that affect health.

In short, it is necessary to implement support plans in educational institutions that reduce psychosocial risk factors in students. These plans must link various institutions, such as the Mayor's Office, family police station, health centers, ICBF, and childhood and adolescent police, among other entities that prioritize the well-being of students.

REFERENCES

- Mesquita-Romero WA, López-Rosero AM. Conductas de riesgo en adolescentes escolarizados. *Rev Huellas*. 2015;1(2).
- Bonilla-Cruz NJ, Moncada HO, Latorre-Yáñez JD, Gómez-Torres HD, Niño-Vega JA. Psychological well-being and suicide orientation in teachers in Norte de Santander during COVID-19 confinement. *Gac Méd Caracas*. 2022;130(Supl 3):S727-S733.
- Barrera-Mesa CE, Caro-Caro EO, Del Rey-Alamillo R. Víctimas de ciberviolencia: formas, prevalencia y diferencias de género. *Rev Investigación, Desarrollo e Innovación*. 2022;12(2):239-250.
- Maalouf FT, Haidar R, Mansour F. Chapter 12 - Child and adolescent mental health research in the Eastern Mediterranean Region—now and in the future. Editor(s): Matthew Hodes, Petrus J. De Vries. *Shaping the Future of Child and Adolescent Mental Health*, Academic Press. 2023:309-337.
- Guerrero-Alcedo JM, Lucena-Torrellas AI, Espina-Romero L. Factores protectores y conductas sexuales protegidas en estudiantes de secundaria venezolanos. *Health and Addictions/Salud Y Drogas*. 2022;22(2):46-62.
- Arasi O, Ajuwon A. Use of sachet alcohol and sexual behavior among adolescents in Ibadan, Nigeria. *African Health Sciences*. 2020;20(1):14-27.
- Zapata-Lamana R, Cigarroa-Cuevas I, Reyes-Molina D, Cornejo-Amestica M, Capdevilla-Ortiz L, Poblete-Valderrama F. Factores protectores de salud en estudiantes universitarios de carreras de educación. *Rev Espacios*. 2020;41(23):121-129.
- Aguiar-Andrade E, Acle-Tomasini G. Resiliencia, factores de riesgo y protección en adolescentes mayas de Yucatán: elementos para favorecer la adaptación escolar. *Acta Colomb Psicol*. 2012;15(2):53-64.
- Cunha IF de F, Silva RJ dos S, Ribeiro DSS, Lima EO, Santos JB do N, Santos LS, et al. Association between exposure to sedentary behavior, sleep indicators, and adolescent behavioral factors. *RSD*. 2022;11(1):e46311125213.
- Nader PA, Hadla R, Majed L, Mattar L, Sayegh S. Results from the Lebanese 2022 report card on physical activity for children and youth. *J Exercise Science & Fitness*. 2023;21(1):14-19.
- Nguyen P, Nguyen DX, Khanh-Dao L, Ananthapavan J, Na PD, Tang K. Results from Viet Nam's 2022 report card on physical activity for children and youth. *J Exercise Science & Fitness*. 2023;21(1):52-57.
- Paredes-Iragorri MC, Patiño-Guerrero LA. Comportamientos de riesgo para la salud en los adolescentes. *Universidad y Salud*. 2020;22(1):58-69.
- Li L, Xu G, Li G, Wang Y, Bian G. Association between second-hand smoke exposure and negative emotions among 12–15-year-old non-smoking adolescents from 63 low- and middle-income countries. *J Affective Disorders*. 2023;325:297-305.
- Mehedi H, Tariqujjaman Y, Yaqoot F, Rabiul H. Geographical variation in the association between physical violence and sleep disturbance among adolescents: A population-based, sex-stratified data analysis from 89 countries. *Sleep Health*. 2023;17:32.
- Rodríguez AC. Detección temprana de factores de riesgo y protectores asociados con el sobrepeso y la obesidad en escolares colombianos (Doctoral dissertation). España: Universidad Pública de Navarra; 2020.
- OMS. Global School-based Student Health Survey. GSHS methodology. 2021. Available at: <https://www.who.int/teams/noncommunicable-diseases/surveillance/systems-tools/global-school-based-student-health-survey/methodology>
- OMS. GSHS core module rationale (2009–2012) Part 12: Manual for Conducting the Global School-based Student Health Survey. 2009. Available at <https://www.who.int/publications/m/item/gshs-core-module-rationale-2009-2012>

18. Tabelak TVI, Kiah FK, Boimau AM, Boimau SV, Tat F, Al-Tadom N. Human Immunodeficiency Virus management in pregnant women at Kupang City Hospital East Nusa Tenggara. *Gac Méd Caracas*. 2023;131(Supl 1):S67-S72.
19. Val A, Míguez MC. La prevención de la conducta suicida en adolescentes en el ámbito escolar: una revisión sistemática. *Terapia Psicológica*. 2021;39(1):145-162.
20. Pulido-Guerrero EG, Lora-Carrillo LJ, Coronel-Arias LV. Evaluación de un modelo explicativo del riesgo suicida con base en factores familiares. *Interdisciplinaria*. 2022;39(2):297-312.
21. Klimenko O, Hernández-Flórez NE, Tamayo-Lopera DA, Cudris-Torres L, Niño-Vega JA, Vizcaino-Escobar AE. Teaching performance assessment favors creativity in a sample of Colombian public and private educational institutions. *Rev Investigación, Desarrollo e Innovación*. 2023;13(1).
22. OPS. Informe sobre la situación mundial del alcohol y la salud 2018. Resumen. Washington, D.C.; 2019.
23. Quiñonez JJ, Peña DL, Salas C, Torres Y. Factores personales y familiares para el abuso del alcohol en adolescentes colombianos de 13 a 17 años. *Universitas Médica*. 2016;57(3):307-322.
24. Cruz-Ramírez V, Gómez-Restrepo C, Rincón CJ. Salud mental y consumo de sustancias psicoactivas en adolescentes colombianos. *Health & Addictions/ Salud y Drogas*. 2018;18(1):97-106.
25. Martínez-Ariza L, Cudris-Torres L, Echeverría-King LF, Niño-Vega JA. Influence of motivation on academic performance: an analysis of motivational assessment in mathematics learning. *Rev Investigación, Desarrollo e Innovación*. 2022;12(1):57-66.
26. Barrera-Mesa M, Fernández-Morales FH. Actitudes hacia la estadística y su enseñanza en estudiantes y docentes de educación básica secundaria y media. *Saber, Ciencia y Libertad*. 2022;17(2):494-522.
27. Linetzky B, Morello P, Virgolini M, Ferrante D. Resultados de la primera encuesta nacional de salud escolar: Argentina, 2007. *Archivos Argentinos de Pediatría*. 2011;109(2):111-116.
28. Ministerio de Salud de Chile. Informe de la encuesta mundial de salud escolar Chile 2013. Organización Mundial de la Salud, Organización Panamericana de la Salud, Centros para el Control y la Prevención de Enfermedades; 2013.
29. Ministerio de Salud y Desarrollo. Tercera Encuesta Mundial de Salud Escolar EMSE In: Ciudad. Argentina; 2018.
30. Instituto colombiano de bienestar familiar. ¿Sexualidad? pilas con el consentimiento. república de Colombia; 2022. Available at <https://www.icbf.gov.co/mis-manos-te-ensenan/sexualidad-pilas-con-el-consentimiento#:~:text=Por%20eso%2C%20cualquier%20acto%20sexual,sexual%20y%20es%20un%20delito>
31. Ebratt-Castro L, Cudris-Torres L, Bahamón MJ, Bonilla-Cruz NJ, Pinzón-Atencio E, Navarro-Rodríguez F. Bienestar psicológico y contextos relacionales en adolescentes con ideación suicida en el caribe colombiano. *Arch Venez Farmacol Terap*. 2020;39(3):268-273.
32. Bahamón MJ, Vásquez-Alarcón Y, Cudris Torres L, Trejos-Herrera AM, Campo Aráuz L. Bienestar psicológico en adolescentes colombianos. *Arch Vene Farmacol Terap*. 2019;38(5):519-523.
33. Guevara-Ortiz JM. Calidad de vida, protección de derechos e inclusión social de portadores del (VIH) en Cúcuta. *Infometric@ - Serie Sociales y Humanas*. 2018;1(2):1-17.
34. Pedreira JL. Conductas suicidas en la adolescencia: Una guía práctica para la intervención y la prevención. *Rev Psicopatol Psicol Clín*. 2019;24(3):217-237.

Mememes and its impact on strengthening students' critical reading skills

Los memes y su impacto en el fortalecimiento de las competencias en lectura crítica de los estudiantes

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SUMMARY

This article reports a study that aimed to determine the level of impact of a didactic strategy mediated by memes to strengthen critical reading skills in elementary school students. We worked with 38 sixth-grade students belonging to a Colombian educational institution. The research was carried out under a mixed approach, where the quantitative approach allowed to establish the variation of the student's performance through a pre and post-test. The qualitative approach was used to characterize the students' reading habits, to identify the type of memes they use on social networks, and to know their perception of the didactic strategy. The results show that the didactic strategy mediated by memes strengthened the students' critical reading skills since there was a high learning gain of 0.859. In addition, the students liked the way and the material with which the teacher oriented them. In conclusion, it

can be said that the impact that the strategy mediated by memes had in the pedagogical planning, as well as in the structuring of the contents, the design of the didactic material, and the learning activities that were considered based on the needs and students' cognitive conditions.

Keywords: Didactic strategy, critical reading skills, memes, teaching methods, learning methods, didactic material.

RESUMEN

Este artículo reporta un estudio que tuvo por objetivo determinar el nivel de impacto de una estrategia didáctica mediada por memes para fortalecer las competencias en lectura crítica, en estudiantes de secundaria básica. Se trabajó con 38 estudiantes de sexto grado pertenecientes a una institución educativa colombiana. La investigación se ejecutó bajo un enfoque mixto, donde el enfoque cuantitativo permitió establecer la variación de los desempeños de los estudiantes a través de una pre y posprueba. El enfoque cualitativo se utilizó para caracterizar los hábitos de lectura de los estudiantes, identificar

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el tipo de memes que emplean en las redes sociales y conocer su percepción frente a la estrategia didáctica. Los resultados muestran que la estrategia didáctica mediada por memes fortaleció las competencias en lectura crítica de los estudiantes, ya que hubo una ganancia de aprendizaje alta de 0,859. Además, a los estudiantes les agradó la manera y el material con el que fueron orientados por parte del docente. En conclusión, se puede decir que el impacto que tuvo la estrategia mediada por memes radicó en la planeación pedagógica, así como en la estructuración de los contenidos, el diseño del material didáctico y las actividades de aprendizaje que se consideraron con base en las necesidades y condiciones cognitivas de los estudiantes.

Palabras clave: *Estrategia didáctica, competencias en lectura crítica, memes, métodos de enseñanza, métodos de aprendizaje, material didáctico.*

INTRODUCTION

Critical reading is one of the skills that require a high degree of attention since, with them, the ability to enrich the knowledge that is detailed through writing is acquired. In addition, it allows the people who acquire them to be reflective, critical, and autonomous of thought (1). Likewise, critical reading improves comprehension since one learns to identify the main and secondary ideas and their relationships in the general structure of a text (2). Some authors point out that through critical reading, it is possible to promote critical thinking since it allows evaluation of the information received and based on it, forming opinions and own ideas (3).

Critical reading skills are fundamental since they allow the development of skills to analyze, evaluate and understand information in an objective and well-founded manner (4). In Colombia, the SABER 11 tests measure whether students have acquired critical reading skills through the following 3 criteria: identify and understand the contents that make up a text, understand how the parts of a text are articulated to give it a global meaning and reflect on a text to evaluate its content (5).

Currently, memes have gained great importance since they have become a trend among users through social networks. Memes emerge as a means of expression that allows the transmission

of an idea, a concept, or a situation through graphic or textual representations. The content of memes is very diverse, and they usually resort to humor or irony to capture the public's attention to a particular theme or opinion (6). An interesting example of using memes occurred in Poland during the COVID-19 crisis, where they were promoted to disseminate news about care, precautions, and the state of the pandemic (7). Some authors have classified memes according to their format and typology: image memes, Internet faces, text memes, video memes, social memes, reflective memes, humorous memes, and situation memes (8).

Didactic strategies are defined as a set of actions by a teacher to carry out the teaching process more pleasantly and optimally for the student (9,10). Strategies designed according to the student's needs enrich the learning process, which is evidenced when the student: acquires a taste for learning, seeks to corroborate what has been learned, and shows good performance in the performance of the evaluations (11). In this sense, the teacher must design an innovative didactic strategy that captures the student's attention so that he is interested in learning (12).

This research aimed to design and validate a didactic strategy mediated by memes to determine its impact on strengthening critical reading skills in basic education students of a Colombian educational institution.

METHODS

The research is empirical-analytical, of an inductive type, and supported under the mixed approach to achieve the proposed objectives (13). The quantitative approach allowed us to statistically corroborate whether or not there was a learning gain and whether or not the meme-based didactic strategy contributed to strengthening students' critical reading skills. The qualitative approach served to know the students' perception regarding the implemented strategy, identify their use of memes, and characterize their reading habits.

The study population was 191 sixth-grade students from a public educational institution in Duitama-Colombia. The selected sample was

for convenience, considering 38 students of that educational level. Figure 1 shows the research methodology that consists of 5 stages, beginning with identifying the technical and pedagogical requirements of the didactic strategy and ending with its validation.

Regarding the measurement instruments, a pre-test and a post-test were used, considering that the dependent variable is the student's critical reading skills. The independent variable is the didactic strategy mediated by memes used in the classroom.

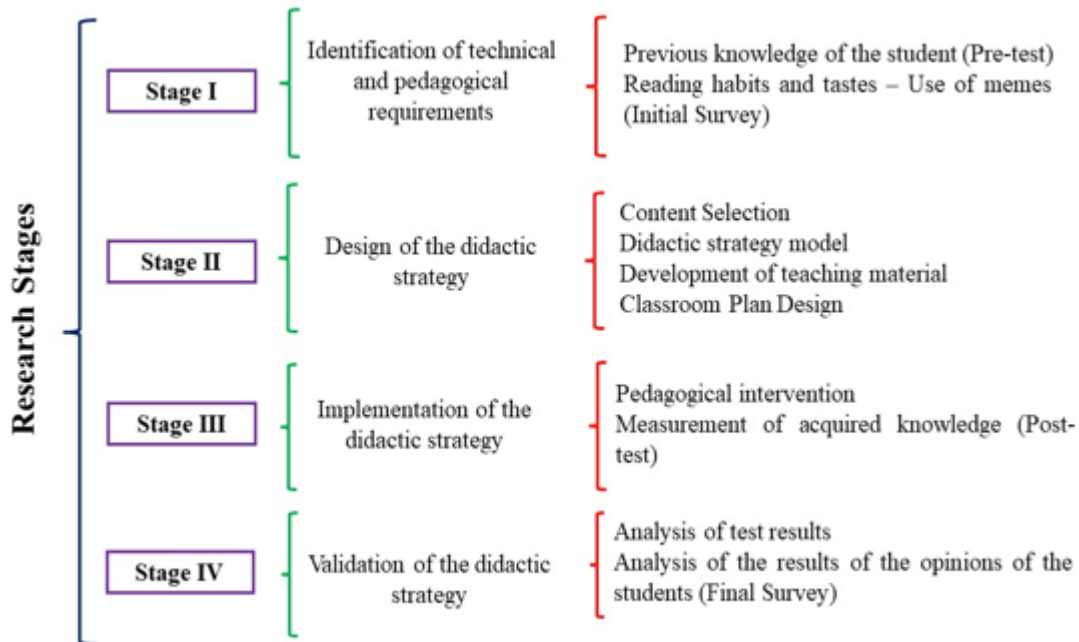


Figure 1. Research stages.

The collected data was analyzed using inferential statistics with the RStudio software (14). The normality of the data was determined using the Shapiro-Wilk test. The learning gain was calculated using the Hake factor (g), while the impact of the didactic strategy was determined using the Chi-Square statistical test.

RESULTS

Didactic strategy

The requirements of the didactic strategy were identified from a pre-test raised from the database

of the Saber tests (5). The test consisted of 20 multiple-choice questions with a single answer, where 10 questions evaluated continuous texts and the other 10 discontinuous texts. Regarding the competencies, 6 questions measured the identification competency, 8 comprehension questions, and 6 reflection questions. The assessment of the test was made with the following scale: Superior (4.6 - 5.0), High (4.0 - 4.5), Basic (3.0 - 3.9), and Low (0 - 2.9).

In the pre-test, it was found that 26 of the 38 students failed it with a low level, 6 students passed with a basic level, 5 students with a high level, and only one student reached a higher performance level. Regarding the type of text,

it was evidenced that the discontinuous texts had the best performance (15 students passed), unlike the continuous texts, where only 11 students passed the test. The results of the pre-test by competencies indicate that the best performance was in identifying ideas in a text since 15 students passed it. In contrast, the competence with the worst performance was comprehension of the information presented in texts, since 33 students failed it with a low level.

Students' reading habits and use of memes were identified through a semi-structured survey. It was found that 29 students like history books, 5 fiction books, and 2 comics, and one student likes romance books. Regarding the frequency of reading per day, 16 students indicated that they read more than 2 hours, 12 read around 2 hours, 6 students read only one hour, and 4 students did not read. The book format students prefer digital (21), while the remaining 17 prefer the book on paper. Regarding memes, all students indicated that they know them and use them on social networks, like this: WhatsApp (30), Facebook (4), Telegram (3), and Instagram (1).

The previous results allowed us to propose the didactic strategy mediated by memes to enhance the comprehension in critical reading of the students, whose model is illustrated in Figure 2.

In the didactic strategy (Figure 2), there is the methodology, the pedagogical models, the units, the role of the teacher, the student, and the type of learning measurement that should be considered to strengthen critical reading skills. The strategy begins with the teacher explaining the topics discussed in class through the traditional model. Then the 4 proposed units are developed under the constructivist approach, where the teacher guides and motivates students to carry out the activities (15). The first two units deal with continuous and discontinuous texts. In the third unit, students learn to create memes using various computer tools so that, after reading a book, they summarize the story using memes. The fourth unit corresponds to training activities to practice what has been learned. The strategy ends with the evaluation of learning so that the teacher makes the respective feedback, based on the shortcomings found.

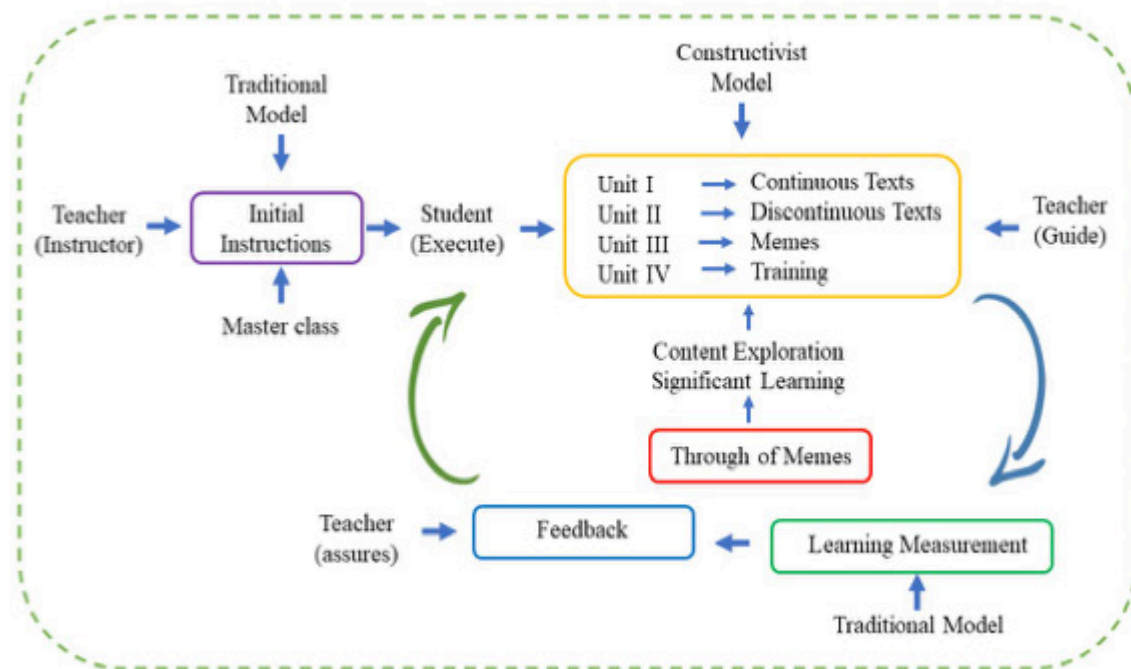


Figure 2. Model of the didactic strategy mediated by memes.

A didactic material was developed according to the cognitive needs of the students and their interests in using memes. A Digital Educational Resource (RED) programmed in the PowerPoint tool and the iSpring Suite complement. The RED allows the student to present the information in different formats and carry out activities such as questionnaires with multiple choice questions, true and false, relationship, drag and drop, timelines, and infographics.

The contents of the RED were structured in 2 sections, one for students and another for teachers. In the section for teachers, the classroom plans are presented to organize each unit's teaching-learning process. In the student section, different activities were programmed to teach about continuous and discontinuous texts, the creation of memes, and training activities.

Classroom experience

The pedagogical intervention was carried out during 10 sessions of 45 minutes, in the subjects of Spanish language and technology and computer science, under the B-learning modality through Google Meet. Initially, the RED was shared with the students, and its functionality was explained. In addition, the general objective of the course was explained, which consisted of reading a literary work to synthesize the most important aspects through memes later. Before this activity, the students had to understand the techniques and strategies used to interpret the information presented in a book, extract the main and secondary ideas, and design and create memes using digital tools.

A web page was created so that students could share the results of the activities through a forum. In this sense, they talked about netiquette, respect for free opinion, censorship of inappropriate language, and copyright protection, essential aspects for a healthy coexistence on the Internet (16,17). Initially, the students showed little interest in the activities because, for the majority, reading was not a matter of their liking. However, exploring the RED and solving the different activities improved students' motivation for critical reading. From the sixth session, the students increased their interest in the subject. At this time, work began on creating memes,

starting with drawing them in the notebook. Then some tools for creating memes were taught, such as quick memes, *Keep Calm Creator*, *Scrapee Imgflip*, *Meme Generator*, and *Rage Maker* (6). Next, the students digitized their memes and shared them with their classmates through the proposed forum.

In the final exercise, each student had to read one of the three proposed books: "Blue Moon: el espíritu del agua", "Rojo Blanco Sangre Azul", and "El chico de las estrellas" (18-20). Then they had to create a meme that synthesized the most relevant aspects of the book and later share them in the forum. If the meme was from the same book corresponding to it, the student could make the respective criticism. Otherwise, the student could be motivated by reading classmates' books to understand the memes' meaning better.

The classroom activity ended with the application of a survey to find out the students' perceptions of the implemented strategy. Likewise, a post-test with the same structure as the pre-test was applied to identify the improvement in critical reading skills of the 38 students. In the latter, it was established that only 1 student failed it, while 3 obtained a basic level, 13 a high level, and 21 a higher level.

Validation of the didactic strategy

The contingency table with the general results of the pre-test and the post-test is shown in Table 1. It is observed that the number of students who are located in the low-performance level decreased from 26 in the pre-test to only one student in the post-test. In addition, the upper level in the pre-test was only reached by one student, while in the post-test, 21 students obtained this level of performance. In other words, there was a considerable improvement in the performance obtained by the students in the post-test.

Table 2 shows an improvement in the performance for the 2 types of texts, since for the continuous texts, only 2 students failed the post-test, while the pre-test failed 24. In the discontinuous texts, there was also a significant improvement since in the post-test, no student obtained a low level, unlike the pre-test, where 27 students failed it.

Table 1. Comparison between pre-test and post-test results

Proof	Performance level			
	Low	Essential	High	Superior
Pre-test	26	6	5	1
Post-test	1	3	13	21

Source: the authors

Regarding the competencies, Table 3 shows that identifying ideas from a text improved in the post-test since only 4 students failed it, unlike the 23 in the pre-test. The competence: understands the information presented in a text; it also denotes a significant improvement in the post-test since 29 students reached a higher performance level. In the pre-test, students still need to reach this performance. The competition reflects on the situations presented in the different texts; it also improved in the post-test because 11 students reached a high-performance level, while in the pre-test this same level was reached by only one student.

The normality of the data was established through the Shapiro-Wilk test under a confidence level of 95 % (21). The null hypothesis was $H_0 =$ the test score variable distributed, while the alternate hypothesis was $H_a =$ the test score variable is not normally distributed. The Shapiro-Wilk normality test yielded a P-value of 0.3995 (P-value > 0.05), so the null hypothesis was accepted: the test score variable has a normal distribution.

Table 3. Results by competitions

Competence	Type of test	Performance level			
		Low	Essential	High	Superior
Identifies	Pre-test	23	9	5	1
	Post-test	4	8	11	15
Understands	Pre-test	33	4	1	0
	Post-test	2	2	5	29
Reflect	Pre-test	28	6	1	3
	Post-test	3	4	11	20

Source: the authors.

Table 2. Results by text types

Types of text	Performance level			
	Low	Essential	High	Superior
Pre-test - Continuous	24	11	1	2
Post-test - Continuous	2	3	14	19
Pre-test - Discontinuous	27	7	3	1
Post-test - Discontinuous	0	1	11	26

Source: the authors

In addition, the learning gain in the students was determined using the Hake factor (g) (equation 1), which establishes the ranges of learning gain based on the results between the percentage of correct answers in both the pre-test and post-test, as follows: Low ($g \leq 0.3$), Medium ($0.3 < g \leq 0.7$), and High ($g > 0.7$) (22).

$$g = \frac{\text{Posttest (\%)} - \text{Pretest (\%)}}{100\% - \text{Pretest (\%)}} \quad (1)$$

When calculating the Hake factor, it was considered that the maximum number of correct answers for each test was 760. In the pre-test, 242 (31.84 %) correct answers were obtained, while in the post-test, 687 (90.39 %)—correct answers. The Hake factor was 0.859, indicating a high gain in student learning in terms of critical reading skills.

Additionally, it was validated if the didactic strategy mediated by memes influenced the population under study in terms of strengthening critical reading skills. This was done through the statistical contrast with Chi-Square, where the null hypothesis was $H_0 =$ The didactic strategy does not influence the strengthening of students' critical reading skills. The alternative hypothesis was that $H_a =$ the didactic strategy does influence the strengthening of students' critical reading skills. The Chi-Square gave a value of 0.000789, so the null hypothesis was rejected, and the alternative hypothesis was accepted. That is, the didactic strategy mediated by memes did influence the strengthening of critical reading skills of the 38 sixth-grade students.

Regarding the opinion of the students on the didactic strategy mediated by memes, the results of the final survey were analyzed, which contained six questions on a Likert scale: Excellent, Good, Regular, and Bad. Table 4 shows that the students found the multimedia resources of the didactic material excellent, as well as the activities and design. The methodology used by the teacher to strengthen critical reading was liked by most of the students, except for one. Likewise, everyone liked the didactic strategy mediated by memes and indicated that it should remain the same since they consider it adequate to improve their critical reading skills.

Table 4. Final Survey Answers

Ask	Rating scale			
	Excellent	Well	Regular	Bad
The topics that were presented in the course were?	3.4	3	1	0
The methodology used by the teacher to strengthen critical reading was	30	5	2	1
For the design of the Lectomeme resource, you consider the following:	35	2	1	0
The multimedia resources (images, videos, gifs, and memes) used in the didactic material seemed	38	0	0	0
The activities that appeared in the resource were	36	2	0	0
The appreciation you have regarding the games that appear in Lectomeme is:	3.4	3	1	0

Source: the authors.

DISCUSSION

Developing the didactic strategy mediated by memes made it possible to strengthen the critical reading skills of the sixth-grade students who participated in the research. Was demonstrated in the statistical analysis of the knowledge tests since the pre-test failed 26 students, unlike the post-test, which failed only one. The Hake factor made it possible to identify that thanks to the didactic strategy mediated by memes, there was a high learning gain of 0.859 in critical reading skills. Likewise, the result of the Chi-Square

statistical contrast allowed us to corroborate that the didactic strategy did influence the strengthening of students' critical reading skills.

The didactic strategy was also validated by the direct opinion of the students since there is no greater critic than the one who has been the protagonist of an event (23,24). The students indicated that the topics and the didactic material used to teach them were pertinent. They found it striking and innovative, unlike how the subject had been worked. The positive opinion of the students regarding the strategy and the didactic material developed, as well as the statistical evidence in the improvement of learning, allow us

to affirm that the research objective was fulfilled.

The preceding confirms the findings of other researchers, related to the fact that the success of didactic strategies in the teaching-learning processes is due to the preliminary considerations of the teacher in terms of the knowledge, abilities, and skills that their students present (25,26). Didactic material plays a fundamental role in this process. Its design should consider, among others, the following aspects: a structure accessible to all students, regardless of their physical or mental condition (27-29); incorporate activities and elements of their daily life, memes in this case (30); be well organized so that students can explore the contents without any restriction or limitation (31). In addition, educational materials must have learning activities for the student to put into practice what they have learned and, if there are difficulties, receive feedback (32).

In the initial survey, students indicated that they read several hours a day, but the pre-test results showed the opposite. The observation and listening of the students in the classroom allowed us to establish that they read but could not understand the information transmitted in the texts. In this sense, some researchers in the Spanish language area indicate that the current educational system focuses on strengthening students' spelling and grammar rather than on their comprehension of texts, which means that tests of state perform poorly (33).

The proposal of multiple didactic strategies to guide the contents of an area of knowledge, even for the same subject, is common (34-36). So many teaching strategies exist because each population is different, even though the content taught is the same. In other words, each student is a universe that feels and thinks differently based on their environment and mental structures, so teachers must design teaching strategies based on the needs of their students (37).

Finally, the pedagogical intervention was carried out in a unified way in Spanish language, technology, and computer science, which was fine for the students. In this sense, transversality becomes an alternative for the design of didactic strategies since it allows the acquisition of interdisciplinary skills (38). In other words, students acquire knowledge, skills, and abilities

that allow them to face the challenges of an increasingly complex and interconnected society (39,40).

CONCLUSIONS

In this research, the positive impact of a didactic strategy mediated by memes was verified to strengthen critical reading skills in 38 sixth-grade students from a Colombian educational institution. The quantitative analysis showed a high learning gain of 0.859, consistent with the improvement in the performance levels in the post-test.

The students recognized that the didactic strategy mediated by memes was pleasant, attractive, and relevant. Indicates that the success of the didactic strategy was related to its design, the contents, the pedagogical models implemented, the learning activities, and the didactic material produced. In addition, the transversality in the subjects of Spanish language and technology and computer science allowed students to learn differently than the traditional one.

In summary, just as the world evolves thanks to scientific and technological advances, the educational system requires major transformations concerned with improving the training processes, bringing elements of the new reality into the classroom, such as memes.

REFERENCES

1. Fuster-Guillén DE, Serrato-Cherres A, Gonzales-Álvarez R, Goicochea-Euribe NF, Guillén-Aparicio PE. Uso de redes sociales en el desarrollo de estrategias de lectura crítica hipertextual en estudiantes universitarios. *Propósitos y Representaciones*. 2020;8(1):e432.
2. Sánchez-Domínguez MG, Izquierdo J. Factores asociados al rendimiento de la comprensión lectora en estudiantes de secundaria. *Diálogos sobre Educación temas actuales en investigación educativa*. 2021;23(12): 1-23.
3. Cifuentes-Garzón JE. Aprendizaje del protocolo de la valoración a través del marco de la enseñanza para la comprensión. *Rev Investigación, Desarrollo e Innovación*. 2021;11(2): 335-348.

4. Galindo-Lozano DP, Doria-Correa R. Lectura, escritura y oralidad en la escuela desde la perspectiva sociocultural. *Rev Investigación, Desarrollo e Innovación*. 2019;10(1):162-176.
5. Padilla-Escorcía IA, González-Tinoco NE, Fernández-Díaz OR. Modelo estadístico para estimar la influencia de la lectura crítica en las competencias evaluadas en las pruebas Saber 11°. *Trilogía Ciencia Tecnología Sociedad*. 2022;14(26):e1882.
6. Benassini-Félix C. Memes de Internet: Multimodalidad, Intertextualidad e Interdiscursividad en tiempos de COVID-19. *Virtualis*. 2020;11(21):1-26.
7. Norstrom, R, Sarna P. Internet memes in Covid-19 lockdown times in Poland. *Comunicar*. 2021;67:75-85.
8. Beskow DM, Kumas S, Carley KM. The evolution of political memes: Detecting and characterizing internet memes with multi-modal deep learning. *Information Processing & Management*. 2020;57(2).
9. Niño-Vega JA, Ducuara-Amado LY, Fernández-Morales FH. Validación de una estrategia didáctica gamificada para la enseñanza-aprendizaje de conceptos de ecología. *Rev Espacios*. 2020;41(46):30-40.
10. Vecino-López MP, Rojas-Valderrama D, Ardila-Ortiz LR, Niño AM, Fontanilla-Ballesteros A, Rivera-Porras D. Efectividad de la estrategia "PRESHABMOTOR" para mejorar la atención, seguimiento de instrucciones y habilidades motoras en estudiantes de segundo semestre en una universidad privada de Cúcuta. *Infometric@ - Serie Sociales Y Humanas*. 2022;5(2).
11. Vergara-Pareja CM, Nielsen-Niño JB, Niño-Vega JA. La gamificación y el fortalecimiento de la habilidad oral en inglés a niños de primera infancia. *Rev Invest Desar Innov*. 2021;11(3):569-578.
12. Panma Y, Clara H, Nurhayati S. Effectiveness of self-acupressure interactive modules as a learning resource in reducing pruritus in hemodialysis patients. *Gac Méd Caracas*. 2023;131(S1):S43-S51.
13. Martínez-Ariza L, Cudris-Torres L, Echeverría-King LF, Niño-Vega JA. Influence of motivation on academic performance: an analysis of motivational assessment in mathematics learning. *Rev Invest Desar Innov*. 2022;12(1):57-66.
14. Juliani E, Rusmono, Winarsih M. Measuring the Learning Model's Effectiveness in the Medical-Surgical Nursing course. *Gac Méd Caracas*. 2023;131(S1):S21-S26.
15. Klimenko O, Hernández-Flórez NE, Tamayo-Lopera DA, Cudris-Torres L, Niño-Vega JA, Vizcaino-Escobar AE. Assessment of the teaching performance favors creativity in a sample of Colombian public and private educational institutions. *Rev Invest Desar Innov*. 2023;13(1).
16. Niño-Vega JA, Giraldo-Cardona MT, Fernández-Morales FH. Analysis of web accessibility to Colombian universities under the guidelines proposed by WCAG 2.1. *Gac Méd Caracas*. 2022;130(3S):S618-S625.
17. Orozco-Báez MY, Niño-Vega JA, Fernández-Morales FH. Ciberacoso y su relación con el rendimiento académico estudiantil. *Rev Venez Gerencia*. 2020;25(4):54-67.
18. López L. *Blue Moo: el espíritu de la laguna*. Planeta. 2020.
19. Mcquiston C. *Rojo, blanco y sangre azul*. Molino. 2019.
20. Pueyo C. *El chico de las estrellas*. Planta. 2015.
21. Barrera-Mesa CE, Caro-Caro EO, Del Rey-Alamillo R. Víctimas de ciberviolencia: formas, prevalencia y diferencias de género. *Rev Invest Desar Innov*. 2022;12(2):239-250.
22. Niño-Vega JA, Gutiérrez-Barrios GJ, Fernández-Morales FH. Recurso educativo digital para el uso racional de la energía eléctrica en comunidades rurales colombianas. *Rev Ciencias Sociales*. 2021;27(Número especial 4):410-425.
23. Rizo-Rodríguez M. Rol del docente y estudiante en la educación virtual. *Rev Multi-Ensayos*. 2020;6(12), 28-37.
24. Calle-Álvarez GY. La rúbrica de autoevaluación como estrategia didáctica de revisión de la escritura. *Rev Invest Desar Innov*. 2020;10(2):323-335.
25. Pérez-Higuera GD, Niño-Vega JA, Fernández-Morales FH. Estrategia pedagógica basada en simuladores para potenciar las competencias de solución de problemas de física. *Rev Invest Admin Ingen*. 2020;8(3):17-23.
26. Macías-Rojas M, Caro EO, Fernández-Morales FH. Las mediaciones TIC en la resolución de problemas matemáticos, un abordaje documental. *Gestión y Desarrollo Libre*. 2022;7(14).
27. Molina-Chalacán LJ, Albarracín-Zambrano LO, Giler-Chango JL. Software educativo personalizado para mejorar procesos enseñanza aprendizaje, en centros educativos fiscales del distrito. *Rev Conrado*. 2020;16(S1):88-94.
28. Niño-Vega JA, Moran-Borbor RA, Fernández-Morales FH. Educación inclusiva: Un nuevo reto para la labor docente en el siglo XXI. *Infometric@ - Serie Sociales y Humanas*. 2019;1(2):74-94.
29. Espinel-Rubio GA, Hernández-Suárez CA, Rojas-Suarez JP. Usos, apropiaciones y nuevas prácticas comunicativas de los usuarios adolescentes de Facebook. *Saber, Ciencia y Libertad*. 2020;15(1):280-296.
30. Manrique-Losada B, Zapata M, Arango-Vásquez SI. Entorno virtual para cocrear recursos educativos

- digitales en la educación superior. *Campus Virtuales*. 2020;9(1):101-112.
31. Figueroa-Gutiérrez V, Montes-Miranda A, Rodríguez-Morato A. Evaluación de programas de formación en TIC: debates y enfoques prevalentes en la investigación educativa. *Saber, Ciencia y Libertad*. 2020;15(1):225-239.
 32. Tsarapkina J, Plahina L, Konoplyuk N, Vaganova O, Lapshova A. The formation of bachelor's digital competencies at the university. *Propósitos y Representaciones*. 2020;9(SPE1):e811.
 33. Trigo-Ibáñez E, Santos-Díaz IC, Sánchez-Rodríguez S. ¿Qué leen los adolescentes españoles? Un estudio de los consumos de lectura analógica. *Investigaciones Sobre Lectura*. 2020;(13).
 34. Mesa-Jiménez FY, Sánchez-Sáenz CL, Gama-Acero Y. Las competencias tic de estudiantes y docentes de programas de formación complementaria de normales en convenio con la UPTC. *Saber, Ciencia y Libertad*. 2020;15(1):297-316.
 35. Bernate JA, García-Celis MF, Fonseca-Franco IP, Ramírez-Ramírez NE. Prácticas de enseñanza y evaluación en una facultad de educación colombiana. *Rev Invest Desar Innov*. 2020;10(2):337-347.
 36. Botello-Plata AG, Cardeno-Portela N, Ramirez-Careño W. Estrategia tecnológica y sistema de gestión de aprendizaje en el ámbito universitario, La Guajira - Colombia. *Saber, Ciencia y Libertad*. 2020;15(1):267-279.
 37. Ayala R. Zooming in on virtual education: biopolitics and student-centered learning. *Educación Médica*. 2021;22(3):177-180.
 38. Hernández-Gil C, Jaramillo-Gaitán FA. Laboratorio de innovación social: hibridación creativa entre las necesidades sociales y las experiencias significativas de los estudiantes de administración de empresas. *Rev Invest Desar Innov*. 2020;10(2):267-281.
 39. Cely-Campoverde GA, Vivanco-Calderón RE, Espinoza-Freire EE. La educación ambiental como transversalidad en la educación básica. *Rev Científica Agroecosistemas*. 2020;8(2):73-82.
 40. Linares-Fleites G. Transdisciplinariedad: nuevo derrotero en el conocimiento científico. *RD-ICUAP*. 2021;7(20):140-155.

Motivational factors, learning strategies and competencies in natural sciences

Factores motivacionales, estrategias de aprendizaje y competencias en ciencias naturales

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SUMMARY

It is analyzed the relationship between the motivational factors with the learning strategies that the students of the Department of Cauca in Colombia present in front of the basic standards of competencies in Natural Sciences. A non-experimental study was carried out with a quantitative approach, correlational type of study, and cross-sectional study time, with 423 participants. As instruments, the EDAOM, EMPA questionnaires, and the results of the basic standards of competencies in natural sciences according to the ICFES tests were applied. The findings indicate that motivation is not the determining factor for the low results obtained in the ICFES, but learning strategies are, so it is necessary to devise and contribute to creating these to obtain better student results.

Keywords: Motivation, learning strategies, basic standards in natural sciences, secondary students.

frente a los estándares básicos de competencias en Ciencias Naturales. Se llevó a cabo un estudio no experimental, de enfoque cuantitativo, tipo de estudio correlacional y momento de estudio transversal, que contó con 423 participantes; como instrumentos se aplicaron los cuestionarios EDAOM, EMPA y los resultados de los estándares básicos de competencias en ciencias naturales según las pruebas ICFES. Los hallazgos indican que, la motivación no es el factor determinante para los bajos resultados obtenidos en el ICFES, pero las estrategias de aprendizaje sí, por lo que se requiere idear y aportar con la creación de estas para obtener mejores resultados en los estudiantes.

Palabras clave: Motivación, estrategias de aprendizaje, estándares básicos en Ciencias Naturales, estudiantes de secundaria.

RESUMEN

Se analiza la relación entre los factores motivacionales con las estrategias de aprendizaje que presentan los estudiantes del Departamento de Cauca en Colombia

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INTRODUCTION

Motivation is defined as the engine of human behavior, arousing the interest in an activity generated by necessity, inciting the subject to

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action, and being of physiological or psychological origin. For this reason, motivational strategies are of great importance in the educational field, allowing students optimal academic performance, and stimulating autonomous learning (1-3).

In this sense, it is necessary to address motivation from two aspects: the intrinsic and extrinsic levels. Intrinsic motivation considers internal factors such as self-determination, curiosity, challenge, and effort, which emerge spontaneously due to internal tendencies and psychological needs that promote behavior without extrinsic rewards (4). While extrinsic motivation changes concerning the autonomy that the subject has, categorized from less to more self-determined, which allows a distinction to be made between external, identified, and integrated according to Bonilla-Yucailla et al. (5). The previous means that the student is extrinsically motivated when they are going to receive a prize or benefit from the activity or task to be carried out, which allows establishing that the motivation is external and of the moment (6,7).

On the other hand, learning strategies are activities or mental methods to facilitate the educational process of students (8). The use of learning strategies implies that students propose and execute work routes, where, if there is management and knowledge about what has to be done to learn, they do it and control it, allowing them to continue their training processes independently or autonomously, processing, understanding and adopting the information acquired in the teaching-learning process in the classroom (9,10).

In turn, the Ministry of National Education in Colombia (11), determined that basic skills are one of the parameters that every boy, girl, and adolescent must know and know how to do to reach the level of quality expected when passing through the educational system, having as basic competences: scientific, citizen, communicative and mathematical competences. In this regard, it can be stated that education worldwide is in continuous change, despite efforts being made to resolve paradigms in the teaching-learning processes, motivation of students, and evaluation by competencies where students are evaluated quantitatively or qualitatively at the same time end each school year with standardized tests (7).

Fajardo-Bullón et al. (12), reaffirm the efforts made throughout history in the educational field on school performance, based on the implication that the school has as an educational system and the characteristics that students present from their social reality. Allows evidence that academic excellence has not been achieved; on the contrary, it is found that performance levels do not improve significantly concerning previous years in the competencies evaluated, as reported by the Colombian Institute for the Evaluation of Education (13), confirming the hypothesis of Suárez-Landazábal and Buendía (14), that despite the multiple efforts to improve the results of the basic competency standards in the different national and international tests, the mechanisms proposed to reach quality education are still far from meeting the objective, calling into question the public policies established by the (MEN, Prueba de ciencias naturales. Ministerio de Educación Nacional de Colombia) (15,16).

The previous allows us to formulate the following question: is there a relationship between motivational factors and learning strategies compared to the basic standards of competencies in natural sciences of secondary school students in the department of Cauca in Colombia?

MATERIALS AND METHODS

A quantitative, correlational, and cross-sectional study was carried out, in which 432 high school students from the Department of Cauca participated. The sampling was probabilistic, as inclusion criteria were considered: students registered and enrolled in SIMAT (Sistema integrado de matrícula) in the department of Cauca, minor students whose guardians have accepted and signed the informed consent, and students of legal age who voluntarily agreed to participate in the study. As exclusion criteria, students who were not enrolled in educational institutions in the Department of Cauca with visual, hearing, and motor disabilities were not considered.

Data collection instruments

The Learning Styles and Motivational Orientation Questionnaire (EDAOM), by

Salomón et al. (17), allows for obtaining results in learning strategies and motivational orientations in high school. This self-report instrument comprises 89 Likert-type items; the Quevedo-Blasco et al. (18) questionnaire was applied, a motivational assessment tool for the learning process (Cuestionario de evaluación motivacional del proceso de aprendizaje, EMPA) that measures both global and intrinsic and extrinsic motivation.

The study was divided into 5 phases, namely: definition of the problem (phase I), literature review (phase II), determination of the functional design (phase III), data collection (phase IV), and data analysis (phase V).

Data Analysis

Once the information collected by the EDAOM, EMPA questionnaires, and the ICFES (Instituto Colombiano para la Evaluación de la Educación) results had been systematized, the descriptive analysis of the sociodemographic variables of the participants was carried out, the analysis of each applied test, and finally, the inferential analysis correlation was made to the results obtained. For this, it was decided to carry out a triangulation that would allow determining whether there was a relationship between the independent variables and the dependent variable through the Spearman rho coefficient test, using the statistical package of SPSS version 23.0.

Ethical considerations

Considering that the participants were minors, permission was requested from the parents, and students who had informed consent were worked with. The data was protected by the study researchers, and the results are shown in a general way, taking care of the identity of the participants.

RESULTS

Within the sociodemographic characteristics, it stands out that 51 % of the participants are male and 49 % female. Most participants are between 11 and 16 years old, and only 12.4 % are older

than 16 years, with a mean of 13.79~14 years and a standard deviation of 2.3 years.

Regarding the race of the students, it was found that 368 students (85.2 %) are mestizos, being the most predominant race, followed by 30 students (6.9 %) indigenous, 24 students (5.6 %) white, 8 Afro-Colombian students (1.9 %) and 2 students (0.5 %) belonged to the black race.

At first, the Spearman correlation between EDAOM and the results obtained from the ICFES test was made, as shown in Table 1, where the following was found for each subscale: (1) selective, the correlation coefficient Spearman's was 0.012, for the subscale called (2) generative it was -0.018, for (3) retrieval of various tasks it was 0.001, for (4) retrieval of exams the result was -0.015, in the subscale (5) convergent the result was -0.049, in (6) divergent it was -0.019, in (7) perceived efficacy it was -0.001, in (8) perceived contingency it was -0.026, in (9) perceived autonomy the result obtained was -0.072; for subscale (10) external approval was -0.02; in (11) achievement was -0.060; for the subscale (12) task it was -0.069 and finally for the subscale (13) self-regulation/material dimension the correlation result was -0.065, in this way it is observed that all the values are close to zero, which indicates that there is no linear correlation between the variables studied (Table 1).

The Spearman correlation was performed between the extrinsic and intrinsic motivation of the EMPA instrument and the results of the ICFES, as shown in Table 2, where the results for the extrinsic motivation subscale referring to the correlation coefficient were -0.045. The intrinsic motivation subscale was -0.001; these values were close to zero, which shows no linear correlation between the motivation measured with the EMPA instrument and the results obtained in the ICFES tests of the participants.

Once the results were obtained, the relationship between the students' motivational factors and learning strategies was analyzed and compared to the basic standards of competence in natural sciences. For this, the results obtained from the two instruments applied EDAOM, EMPA, and the results obtained from ICFES were taken into account. To this, the results showed no correlation between motivation and the scores obtained in the tests presented for natural sciences.

Table 1. Results of correlations between the results obtained in EDAOM and the ICFES.

Rho of Spearman	Subscale	Correlations													Resulted in ICFES			
		Subscale 1	Subscale 2	Subscale 3	Subscale 4	Subscale 5	Subscale 6	Subscale 7	Subscale 8	Subscale 9	Subscale 10	Subscale 11	Subscale 12	Subscale 13				
Subscale 1	Correlation coefficient	1.000																
	Sig. (bilateral)	--																
Subscale 2	Correlation coefficient	0.563**	1.000															
	Sig. (bilateral)	0.000	--															
Subscale 3	Correlation coefficient	0.563**	0.528**	1.000														
	Sig. (bilateral)	0.000	0.000	--														
Subscale 4	Correlation coefficient	0.454**	0.622**	0.600**	1.000													
	Sig. (bilateral)	0.000	0.000	0.000	--													
Subscale 5	Correlation coefficient	0.537**	0.593**	0.600**	0.491**	1.000												
	Sig. (bilateral)	0.000	0.000	0.000	0.000	--												
Subscale 6	Correlation coefficient	0.516**	0.607**	0.603**	0.491**	0.607**	1.000											
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	--											
Subscale 7	Correlation coefficient	0.431**	0.673**	0.603**	0.639**	0.607**	0.545**	1.000										
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	0.000	--										
Subscale 8	Correlation coefficient	0.647**	0.584**	0.515**	0.551**	0.514**	0.545**	1.000										
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--									
Subscale 9	Correlation coefficient	0.286**	0.264**	0.243**	0.236**	0.387**	0.219**	0.409**	1.000									
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--								
Subscale 10	Correlation coefficient	0.534**	0.425**	0.414**	0.544**	0.476**	0.335**	0.491**	0.573**	1.000								
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--							
Subscale 11	Correlation coefficient	0.107*	0.025	-0.083	0.006	0.012	-0.163**	0.132**	0.421**	0.408**	1.000							
	Sig. (bilateral)	0.026	0.610	0.084	0.906	0.811	0.001	0.006	0.000	0.000	0.000	--						
Subscale 12	Correlation coefficient	0.485**	0.716**	0.389**	0.502**	0.761**	0.593**	0.521**	0.468**	0.641**	0.641**	1.000						
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--					
Subscale 13	Correlation coefficient	0.559**	0.548**	0.490**	0.514**	0.610**	0.516**	0.656**	0.468**	0.569**	0.569**	0.643**	1.000					
	Sig. (bilateral)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	--				
Resulted in ICFES	Correlation coefficient	0.012	-0.018	0.001	-0.015	-0.049	-0.019	-0.001	-0.026	-0.072	-0.020	-0.060	-0.065	1.000				
	Sig. (bilateral)	0.804	0.704	0.984	0.760	0.310	0.691	0.991	0.593	0.134	0.675	0.213	0.180	0.065	--			

Note. **. The correlation is significant at the 0.01 level (bilateral).
*. The correlation is significant at the 0.05 level (bilateral).

MOTIVATIONAL FACTORS

Table 2. Results of correlations between the results obtained from EMPA and the ICFES.

		Correlations	Resulted in ICFES	Extrinsic	Intrinsic
Rho of Spearman	Resulted in ICFES	Correlation coefficient	1.000	-0.045	-0.001
		Sig. (bilateral)	--	0.346	0.984
	Extrinsic	Correlation coefficient	-0.045	1.000	-0.124*
		Sig. (bilateral)	0.346	--	0.010
	Intrinsic	Correlation coefficient	-0.001	-0.124*	1.000
		Sig. (bilateral)	0.984	0.010	--

*The correlation is significant at the 0.05 level (bilateral)

In this regard, the results of the ICFES tests were analyzed concerning the natural science component, presented by students from the sixth to eleventh grades of the year 2021, as indicated in Table 3. The results show that the average performance level of the students is low. The

students are, on average, at level 1; therefore, the student lacks skills to recognize explicit information presented in tables or graphs with habitual language, which implies reading a single independent variable for competencies in natural sciences.

Table 3. Descriptive statistics of the ICFES 2021 results

	N	Minimum	Statistics descriptive		
			Maxime	Media	Deviation
Resulted in ICFES	432	8	61	28	8.301

Note. Results obtained according to the tests applied and interpreted by the assigned scale of the ICFES 2021

Table 4 shows the averages of the EDAOM test applied to the group of 432 students, observing that these results range between 37 and 83 points according to Table 1 of interpretation of the score obtained; most of the scores are located in the range with regular learning ability. Among them are the selective, generative, various task recovery, exam recovery, convergent, divergent, and sub-task subscales; for a total of seven subscales, the scale of perceived efficacy, perceived autonomy, and external approval are located at a low level, and the subscale of perceived contingency, achievement subscale, and self-regulation/material dimension is in a high learning capacity.

With the above, it can be established that there is no significant relationship between the motivational factors with the learning strategies compared to the basic standards of competencies in natural sciences of the students participating in

the study. In this way, it is necessary to consider the results, not in a group for the independent variables: motivation and learning strategies, but rather the result obtained from one of these variables about the dependent variable: basic standards of competencies in science natural. In this sense, it is guaranteed to obtain more conclusive results that allow the institution to propose actions in search of achieving educational quality, taking into account the context, the realities of the students, and the inputs with which they have for the development and strengthening in their teaching-learning process and their formation as a human being.

DISCUSSION

Authors such as Palencia and Barragán (6); Simbaña (2); Casanova et al. (3) state that intrinsic

Table 4. Average results of the EDAOM

Scales EDAOM	Subscales EDAOM	Mín.	Máx.	\bar{x}	s	Average capacity
Acquisition	1 Selective	31	94	68	11.687	R
	2 Generative	20	100	75	15.944	R
Memory resource management	3 Recovery Various Tasks	13	93	69	14.973	R
	4 Exam Recovery	17	100	67	15.217	R
Information processing	5 Convergent	29	100	77	15.568	R
	6 Divergent	0	100	74	17.094	R
Self-regulation / Person dimension	7 Perceived Efficacy	0	80	50	14.372	L
	8 Perceived Contingency	56	100	83	11.946	H
	9 Perceived Autonomy	9	76	51	12.197	L
	10 External Approval	0	93	37	23.923	L
Self-regulation / Task dimension	11 Achievement	31	100	82	15.305	H
	12 Subtask	29	100	75	13.622	R
Material dimension	13 Self-regulation scale	26	100	81	14.342	H

Note. The average capacity is given as follows: L: Low R: Regular and H: High according to the interpretation of Salomón et al. (17)

and extrinsic motivation are related to academic performance in the classroom and external tests. In this study, it is observed that extrinsic motivation is low compared with intrinsic motivation according to the results provided by EMPA, and it is evident that in the high school student population of the Department of Cauca, motivation does not depend on them but on external factors. Of the environment where they live and where they are educated.

The results of EDAOM in the learning strategies, compared to the average learning capacity obtained in the applied instruments, were regular. Therefore, it can be said that how the information is acquired is not the best way, and therefore, when applying it later in school activities, its results are not those expected in the student population for the study area as natural sciences (19).

Regarding the results from the analysis analysis associated with the basic standards of competence for natural sciences, it is found that 92.8 % of the students are located at performance level 1 established according to ICFES (20). These results show that, in general, students have

little ability to develop competencies: extensive use of scientific knowledge, explanation of phenomena, and inquiry. This means that the objective set by the Organization for Economic Cooperation and Development (21) is not being met since they reaffirm that the use of various standardized tests, both nationally and internationally, is to achieve educational quality in addition to generating skills to that students respond once they finish each school year.

The results obtained in this study contribute with various studies carried out to date in Colombia, such as that of Timarán-Pereira et al. (19), in which they socialized patterns that allowed identifying good or poor academic performance in the natural sciences test for the ICFES. Likewise, Tapasco-Alzate et al. (16), attributes poor school performance to high school education in line with the results obtained in the ICFES tests and the admission record to the first semester of university careers. What led to a detailed analysis of the formation and development of natural science skills in the classroom of the students of the population studied.

REFERENCES

1. Suárez J, Fernández A, Sánchez V, Zamora A. Incidencia de las estrategias motivacionales de valor sobre las estrategias cognitivas y metacognitivas en estudiantes de secundaria. *Rev Complut Educ.* 2016;27(2):421-435.
2. Simbaña EP. La motivación en el aula y la enseñanza aprendizaje en la asignatura de Química, en los estudiantes del Bachillerato General Unificado, de la Institución Educativa Particular Fernando Ortiz Crespo, del D.M. de Quito, 2018-2019 [dissertation]. Quito: Universidad Central del Ecuador. 2019.
3. Casanova DY, Hernández D, Sarmiento DF. Emoción, motivación y autorregulación del aprendizaje en los estudiantes de básica secundaria y media de las instituciones educativas Pío XII y General José María Cabal [dissertation]. Colombia: Corporación Universitaria Minuto de Dios. 2021.
4. Salehpour G, Roohani A. 2020. Relationship between intrinsic/Extrinsic motivation and L2 speaking skill among Iranian male and female EFL learners. *Bellaterra J Teach Learn Lang Lit.* 2020;13(1):43-59.
5. Bonilla-Yucailla D, Balseca-Acosta A, Cárdenas-Pérez MJ, Moya-Ramírez D. Emotional intelligence, engagement, and academic self-efficacy. analysis mediation within Ecuadorian universities. *Interdisciplinaria.* 2022;39(2):249-264.
6. Palencia CS, Barragán N. Apoyo familiar, motivación académica y rendimiento académico en estudiantes de 10 a 12 años en una Institución distrital de la ciudad de Cartagena [dissertation]. Cartagena: Universidad de San Buena Aventura. 2019.
7. Martínez-Ariza L, Cudris-Torres L, Echeverría-King LF, Niño-Vega JA, Influence of motivation on academic performance: an analysis of motivational assessment in mathematics learning. *Rev Investig Desarro Innov.* 2022;12(1):57-66.
8. Hernández-Suárez CA, Avendaño-Castro WR, Rojas-Guevara JU. Planeación curricular y ambiente de aula en ciencias naturales: de las políticas y los lineamientos a la aplicación institucional. *Rev Investig Desarro Innov.* 2021;11(2):319-334.
9. Bustos V, Martínez-Gregorio S, Galiana L, Oliver A, Olivos M. Estrategias de aprendizaje y actitudes emprendedoras: un modelo predictivo de la intención emprendedora en estudiantes universitarios peruanos. *Av Psicol Latinoam.* 2022;40(1).
10. Bonilla-Cruz NJ, Moncada HO, Latorre-Yáñez JD, Gómez-Torres HD. Niño-Vega, J.A. 2022. Psychological well-being and suicide orientation in teachers in Norte de Santander during COVID-19 confinement. *Gac Méd Caracas.* 2022;130(Supl 3):S727-S733.
11. Ministerio de Educación Nacional. Estándares Básicos de Competencias en lenguaje, matemáticas, ciencias y ciudadanas: Guía sobre lo que los estudiantes deben saber y saber hacer con lo que aprenden [Internet]. República de Colombia; 2006 [cited 2022 aug. 13]; Available from: <https://www.mineducacion.gov.co/1621/article-116042.html>
12. Fajardo-Bullón F, Maestre-Campos M, Castaño E, León del Barco B, Polo del Río MI. Análisis del rendimiento académico de los alumnos de educación secundaria obligatoria según las variables familiares. *Educación XXI.* 2017;20(1):209–232.
13. ICFES. Guía de orientación grado 8: Ciencias Naturales y Educación Ambiental. Cuadernillo 2. Colombia: Instituto Colombiano para la Evaluación de la Educación (ICFES). 2021.
14. Suárez-Landazábal N, Buendía A. Effects of the evaluation and accreditation processes on academics. A case study of a Colombian higher education institution. *EPAA.* 2020;28(113):1-34.
15. Timarán-Pereira R, Caicedo-Zambrano J, Hidalgo-Troya A. Árboles de decisión para predecir factores asociados al desempeño académico de estudiantes de bachillerato en las pruebas Saber 11°. *Rev Invest Desarro Innov.* 2019;9(2):363-378.
16. Tapasco-Alzate OA, Ruiz-Ortega FJ, Ramírez-Ramírez D. El historial académico de secundaria como factor predictor del rendimiento universitario. Caso de estudio. *Rev Colomb Educ.* 2021;1(81):147-170.
17. Salomón J, Priego H, De la Fuente C. Estilos de aprendizaje y orientación motivacional. El caso de los estudiantes de primer ingreso de Médico Cirujano de la Universidad Juárez Autónoma de Tabasco. *Perspectivas Docentes, Espectros.* 2013;51:17-24.
18. Quevedo-Blasco R, Quevedo-Blasco V, Téllez-Trani M. Cuestionario de evaluación motivacional del proceso de aprendizaje (EMPA). *EJIHPE.* 2016;6(2):83-105.
19. Timarán-Pereira R, Hidalgo-Troya A, Caicedo-Zambrano J, Patrones de desempeño académico de los estudiantes de educación media en la Prueba de ciencias naturales del Saber 11 con árboles de decisión. *RISTI.* 2020;32(8):190-201.
20. ICFES. Prueba de ciencias naturales Saber 11°, Marco de Referencia para la evaluación. MEN 14. Colombia: Instituto Colombiano para la Evaluación de la Educación (ICFES). 2020. Available from: <https://www2.icfes.gov.co/documents/39286/1252696/Marco+de+referencia+-+Prueba+de+ciencias+naturales+Saber+11.pdf/41aa8c23-e9bb-9f42-4e43-18cf2bfb59a1?version=1.3&t=1662407293654>
21. OCDE. PISA 2018: Assessment and Analytical Framework, PISA. Paris: OECD Publishing, 2019. Referenced in doi <https://doi.org/10.1787/b25efab8-en>

Autism spectrum problems, attention deficit, anxiety symptoms and IQ in children from 2 to 5 years

Problemas del espectro autista, déficit de atención, sintomatología ansiosa y coeficiente intelectual en niños de 2 a 5 años

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SUMMARY

The aim of the study was to establish the relationship between autism spectrum problems, attention deficit, anxiety symptoms, and IQ in children aged 2 to 5 years, through a quantitative correlational methodology. The sample consisted of 189 children and their parents and/or caregivers belonging to child development centers and children's homes in the city of Sincelejo, Colombia. The Wechsler Intelligence Scale for Preschool and elementary school children - WPPSI IV and the Child Behavior Check List - CBCL were applied. The main result was that in the Pearson correlation coefficient, anxious symptomatology and attention deficit were not related to any IQ index, while autism spectrum problems were related to the processing speed index (-0.282).*
Keywords: IQ, autism, anxiety, childhood, attention deficit.

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RESUMEN

El objetivo del estudio consistió en establecer la relación entre problemas del espectro autista, déficit de atención, sintomatología ansiosa y coeficiente intelectual en niños de 2 a 5 años, a través de una metodología cuantitativa de tipo correlacional. La muestra fue de 189 niños y sus padres de familia y/o cuidadores pertenecientes a centros de desarrollo infantil y hogares infantiles de la ciudad de Sincelejo, Colombia. Se aplicó la Escala de Inteligencia Wechsler para preescolares y primarios - WPPSI IV y el Child Behavior Check List - CBCL. Como resultado principal se obtuvo que en el coeficiente de correlación de Pearson la sintomatología ansiosa y el déficit de atención no se relacionaron con ningún índice del coeficiente intelectual, mientras que, los problemas del espectro autista se relacionaron con el índice de velocidad de procesamiento (-0,282).*
Palabras clave: Coeficiente intelectual, autismo, ansiedad, infancia, déficit de atención.

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INTRODUCTION

Neurodevelopment in the individual begins in intrauterine life and continues throughout life as a multidimensional and evolutionary process, where the person progressively acquires skills that often become more complex, which serve to consolidate a way of interacting with the world and transform it (1). Similarly, Wechsler (2) defines intelligence as the aggregate or global capacity of a subject to act with purpose, to think rationally, and to develop effectively with his environment and context.

In Colombia, early childhood is considered the stage that includes the development of children from gestation to 6 years of age. This stage is considered decisive for the development of children at the biological, mental, social, and cultural levels because it plays a crucial role in the structuring of personality, social behavior, and intelligence (3). Meza et al. (4) point out that in early childhood there is physical growth and remarkable development at sensory and perceptive levels. Also in early childhood, there is a significant awakening in the intellectual, emotional, and social components, being a period of great influence on the well-being of the person because it is a stage of significant brain development and growth.

It is precisely at this stage of development that the neurophysiological and psychological structures are in the process of maturing, a situation that increases the degree of vulnerability of this population due to the quality and quantity of influences that they receive from different factors and that they cannot control. An example of this, is the increase to a greater extent of the vulnerability levels of this population that occurs in the Department of Sucre, one of the poorest areas of Colombia (5) and has been immersed for many years in an environment of violence and armed conflict.

Virues-Ortega et al. (6) consider that this stage is the most significant moment of growth in development, therefore, they suggest that the development quotient (DC) and the intelligence quotient (IQ) can function as useful factors for the identification of children who need early intervention, since low IQ in childhood can affect in the short and long term the teaching and learning

processes, besides causing an increase in school dropout. In the future, it can significantly affect the subject's work performance and therefore be a limiting factor for his or her social and economic development (7,8).

Some representative research on psychopathology in preschoolers has estimated a prevalence of disorders in preschoolers between 7 % and 25 % (9,10). Also, research conducted in twenty-three countries including South American countries found that, despite differences in child rearing and social class, the symptom patterns for the presence of childhood disorders were similar.

On the other hand, it is important to mention that among the most frequent disorders in early childhood are: attention deficit hyperactivity disorder, autism spectrum disorders, separation anxiety, developmental delay disorders, mutism, reactive attachment disorder, specific learning disorders, motor disorders, oppositional defiant disorder and depressive disorder (11).

Autism Spectrum Disorders and IQ

The autism spectrum implies a delay in the development of language and stereotyped behaviors, restricted interests, and difficulties in establishing social relationships (12). From this perspective, Carter et al. (13) stated that it is important in this type of study to consider that the acquisition of significant learning is achieved in the interaction between the individual and the society. The Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSMV) specifies that the symptoms of autism spectrum disorder (ASD) should not be explained by intellectual disability. However, it should be considered that a comorbid diagnosis of ASD in a subject with an intellectual disability may be appropriate, even more so in situations where communication and social interaction are significantly altered in relation to what is expected from the developmental level (14).

Previous research shows that, even for autism, a high IQ can be a protective factor that decreases risk factors, unlike a low IQ (13,15,16). One of the first studies investigating IQ and autistic symptoms was that of Bartak and Rutter (17) who reported that of 17 children with autism and nonverbal IQ < 70 had more stereotypies,

self-injurious behavior, resistance to change, attachment to foreign objects, and lack of emotional expression, whereas in 19 children with autism and nonverbal IQ ≥ 70 the occurrence of this symptomatology decreased. In contrast, children with high-functioning autism had greater sensitivity to noise and more rituals than children with low-functioning autism. The two groups did not differ in language delay or deficits in peer relationships, although high-functioning children had less difficulty interacting with adults than low-functioning children.

Another study by Mayes and Calhoun (18) found that children with autism and mental retardation had more severe self-injurious behavior than higher-functioning children, which increased the level of vulnerability and psychosocial risk. Likewise, Matson and Shoemaker (19) mentioned that the lower the IQ, the greater the severity of the presence of autistic traits. Also, they found that lower IQ was related to the severity of ASD symptoms than any other factor, even age.

Bishop et al. (20) found that in a large sample of 1- to 11-year-old children with autism and a wide range of IQ, repetitive object uses and stereotyped hand movements increased as nonverbal IQ decreased (particularly in older children), but circumscribed interests (obsession with fact acquisition and curiosities) increased with increasing nonverbal IQ.

Although in young children, brain plasticity may indicate less stability in IQ scores. Follow-up cohort-based research shows progressive gains in IQ throughout the first years of life, mainly at 2 and 3 years of age (21). In this sense, Solomon et al. (22) studied the evolution of IQ in the early stages of autism development, finding the existence of a correlation between IQ and developmental trajectories. Children with ASD or autistic traits usually require more care and attention from family members or caregivers (23,24), so early diagnosis and intervention of these children is necessary to minimize the impact and delays they may experience in later functioning.

Due to this high incidence, some studies consider low IQ as comorbid with autism, that is, as a condition with an origin and cause independent of autism. Due to the concurrence

of both: low IQ and autism, some research has attempted to define the characteristics of autism by controlling the dominance that intellectual capacity can have on it (25). On the other hand, there is another approach from which both disorders are conceived as two alterations that have an etiological relationship. To try to explain the interdependence between both constructs, these approaches are based on two types of data: on the one hand, from the perspective that there is a greater risk of intellectual disability in children who during the first years of life showed marked ASD symptoms, and on the other hand, on the importance of experiences at a social level at an early age in later development at a cognitive level (26).

Attention deficit and IQ

Attention is a multidimensional construct, which generates a large number of alterations in this process that can be observed in childhood (27). Attention deficit is evidenced by the impossibility of maintaining sustained attention in specific tasks or activities, remembering rules, following instructions, selecting important stimuli, and avoiding distractions (14,28).

Low IQ can frequently appear in conjunction with attention deficit disorder, as this is one of the most prevalent disorders in childhood today, in addition to emotional disorders, sensory disorders, and cognitive deficits. Similarly, low IQ, to some extent, may or may not be associated with the appearance of disciplinary and coexistence problems in the school setting (29).

Although the most frequent symptoms may correspond to Attention deficit hyperactivity disorder (ADHD), conduct disorders, learning disorders, anxiety, or depressive disorders, among others, the diagnosis of one of these pathologies is not exclusive to having a low normal IQ, which is congruent with the fact that, in child psychopathology, comorbidity is considerably high. Such comorbidity may correspond to pathologies independent or secondary to the appearance of low normal IQ, such as behavioral problems, emotional problems, anxious or depressive disorders, and/or learning disorders (30).

Anxious symptoms and IQ

Anxiety is very frequent in childhood (31) and specifically within the preschool stage, where it causes strong repercussions in the present and later periods of development, affecting the individual, family, social and educational functioning of children (32), since this is a period in which multiple developmental changes occur both neurologically and environmentally (33).

Both anxious symptoms and fear are present in children in early childhood, in many situations as part of the normative development of children, as they may appear as a fragment of survival and adaptation mechanisms (34). These manifestations appear as a response to specific stimuli from the child's developmental stage and can be transient and adaptive (35). Normally thanks to the accompaniment of parents, caregivers, and cognitive and affective capacities, children learn to manage them without having received a specific treatment (36).

Anxiety disorders are very common in people with low IQ, although it is very common for them to go undiagnosed and untreated. Sometimes they come from childhood, which makes it difficult to record exactly when they appear. Some researchers such as Franco (37) point out that people with low IQ have more frequent difficulties in coping with problems, proposing solutions, and confronting them. They also have unrealistic expectations of the family and greater problems with adaptive behavior, which facilitate the appearance of anxious symptoms (38).

According to Franco (37) in people with intellectual disabilities, the presence of anxious symptoms is common and they usually present with behavioral problems, which are aimed at avoiding a situation that may be difficult, complicated, or that they cannot cope with and that obviously constitutes the focus of anxiety. Also, according to Einfeld and Tongel (39), anxiety is closely related to low IQ, and it is a pathology that, according to different studies, appears frequently in this population.

Therefore, anxiety with the intense suffering it can cause in the sufferer can go unnoticed in many situations, and even more so in people with low

IQ. Shyness, avoidance, fear, stuttering, as well as other manifestations, in various circumstances, will be misinterpreted as normal conditions of a person, because he/she has a diagnosis of low IQ. But it is necessary to mention that excessive fears are not related to any specific personality type, so their manifestation should alert them about the presence of anxious symptoms (40).

In general, the occurrence of certain disorders in children can affect cognitive functioning. In terms of anxiety disorders, studies of anxious children have shown detrimental effects on neuropsychological performance, such as executive function, memory, attention, and learning. Studies specifically addressing working memory have shown that anxiety negatively affects this cognitive function in children (41).

Based on the above, the present study aims to establish the relationship between autism spectrum problems, attention deficit, anxiety symptoms, and IQ in children aged 2 to 5 years in the city of Sincelejo, Colombia. It is also expected to find a relationship between low IQ scores and the presence of children with autism spectrum symptoms, attention deficit symptoms, and anxiety symptoms.

METHOD

Participants

The sample of this study was intentional, with the participation of children who met the inclusion criteria of the database constructed: being a boy or girl enrolled in one of the Child Development Centers (CDI) in the city of Sincelejo, between 2 and 5 years of age, signed voluntary informed consent by a parent or caregiver with parental authority, and having completed the protocol applied to meet the objective of this publication. These criteria were met by 189 children between 2 and 5 years of age linked to the CDI in Sincelejo-Colombia together with their parents and/or caregivers. We worked with 102 children equivalent to 54 % of the population who were between 2.6 and 3.11 years old, while the remaining 87 children correspond to 46 % with ages between 4 and 5.11 years old (Table 1).

Table 1. Characterization of children

	Ages		Sex	
	2.6 – 3.11 years	4 – 5.11 years	Female	Male
Percentages	54 %	46 %	56 %	44 %

Likewise, we worked with 189 parents and/or caregivers, 97.4 % female and 2.6 % male, who ranged in age from 28 to 68 years. 59.3 % were between 28 and 48 years of age, while 40.7 % were between 48 and 68 years of age. The mean age of the participants was 45 years.

Instruments

The Wechsler Preschool and Primary Scale of Intelligence WPPSI IV (2) is an individually administered clinical test. It is designed to assess intellectual aptitudes and general IQ in children between 2 years and 6 months and 7 years and 7 months. The structure of the test is organized into three levels of interpretation: primary scales, secondary scales, and total scales. Each of these levels in turn is made up of subscales of verbal comprehension, visuospatial index, working memory (primary scales) and vocabulary acquisition, nonverbal index, and general ability (secondary scales) for both age groups, in addition to the evaluation of fluid reasoning, processing speed and cognitive competence for children between 4 years and 7 years and 7 months.

Regarding the psychometric properties, the manual states at a general level that the reliability of the W/PSSI-IV tests preserves or improves that of the WPPSI-III tests. Specifically, reliability coefficients are adequate for the subscales Figure Key, Comprehension, and Cancellation, there are good coefficients for Similarities, Vocabulary, Information, Drawings, Names, Cubes, Puzzles, Concepts, and Location, and excellent coefficients for Recognition, Matrices, and Animal Search. That is, the average reliability coefficients of the WPPSI-IV composite scores are between 0.85 and 0.93.

The Child Behaviour Checklist (CBCL 1½-5) is a standardized instrument that allows the

recording of behavioral problems and functioning of preschoolers in different situations. This test has been frequently used in cross-cultural research and applied to Colombian children. The questionnaire applies to parents, caregivers, and/or tutors who live with the child in their family context. In this process, the individual is instructed to read a list of 99 child problems and to indicate the most appropriate option for each situation: not so true for the child (0), sometimes or somewhat true (1), very true, or occurs very often (2).

Regarding the psychometric properties, the authors of this instrument obtained test-retest correlations of 0.80 and 0.90 for the Internalizing and Externalizing syndromic scales, and 0.90 for the Total Problems scale (Achenbach and Edelbrock, 2000; Rescorla, 2005). In addition, they found high levels of internal consistency reliability for Total Problems (r = 0.95), Internalizing (r = 0.89), and Externalizing (r = 0.92) (42).

Procedure

This study was of positivist paradigm, quantitative approach which, according to Hernandez et al. (43), “uses the collection of information and data analysis to answer research questions and get to test the hypothesis through numerical measurement, counting and the use of statistical analysis” (p. 95). Likewise, it was of a correlational type, whose “objective is to identify the degree of relationship or association that may exist between one or more variables within a specific context” (Hernández et al., 2014, p. 85). It was of non-experimental design, since “there was no deliberate manipulation of the study variables” (43).

Child development centers in the city of Sincelejo were contacted, to which the project

was presented and consent was requested to talk with the parents of the children participating in their homes. After their approval, the parents and/or caregivers were summoned to socialize the research project and request their participation by signing the voluntary informed consent form designed for the research entitled: “Development of a Predictor Model of Determinants of IQ in Children aged Three to Five years in Sincelejo”, this informed consent was prepared by the researchers and socialized with the different participants in the research, being approved by all of them, guaranteeing the privacy of the data, respect for the participation and the guarantee of the good treatment of the data and exclusive use only for scientific publications and scientific reports, without mention of personal names of those evaluated. Once parental consent was obtained, the entire protocol of the different scales and instruments designed for the same was applied, including the Wechsler Intelligence Scale for Preschool and Primary School WPPSI IV to the children and the Child Behaviour Checklist instrument to parents and/or caregivers, which was conducted by telephone due to the availability of the participants and the beginning of the COVID-19 pandemic in the year 2020.

Statistical analysis

Data analysis was carried out using the Statistical Package for Social Science (SPSS) V. 20 statistical software. Initially, descriptive and frequency statistics were used for each of the variables studied, and later, to determine the relationship between IQ, autism spectrum problems, attention deficit, and anxiety symptoms, a correlational analysis was carried out using Pearson’s correlation coefficient.

RESULTS

Presence of autism spectrum disorders, attention deficit, and anxiety symptoms in the sample

The mean score of each of the subscales of the Child Behaviour Checklist studied was not within the clinical range indicated by the instrument. This is detailed in Table 2.

The mean overall IQ for the participating children was 80.41. Table 3 describes the mean performance for each index evaluated.

Table 2 . Problems of anxiety, autism spectrum disorder, and attention deficit disorder in participants

	Minimum	Maximum	Mean	Standard deviation
Anxiety problems	0.00	11.00	3.01	2.29
Autism spectrum disorder problems	0.00	13.00	1.51	2.21
Attention deficit problems	0.00	10.00	2.80	2.09
IQs and indices in the sample				

Table 3. IQ and subscales

	Minimum	Maximum	Mean	Standard deviation
Verbal Comprehension	45	122	71.13	12.30
Spatial Viso Capacity	49	112	77.73	10.96
Fluid reasoning	60	106	75.12	9.05
Memory Work	46	131	84.65	14.81
Processing Speed	54	106	75.47	8.71
Vocabulary Acquisition	45	128	79.22	15.96
Non Verbal	49	116	79.95	10.56
General Capacity	56	111	76.13	10.55
Cognitive Competence	53	97	70.49	8.72
General IQ	61	116	80.41	11.06

Table 4 shows the results corresponding to the significant associations between variables. It should be noted that in the Pearson correlation coefficient, anxious symptomatology and attention deficit were not related to any IQ index. While autism spectrum problems were related to the processing speed index.

Table 4. Significant Pearson Correlation Results

CI	TEA
Verbal Comprehension	-0.062
Capacity Viso Especially	-0.021
Fluid reasoning	0.171
Work Memory	0.043
Processing Speed	-0.282*
Vocabulary Acquisition	-0.075
Non Verbal	0.006
General Capacity	-0.034
Cognitive Competence	-0.023
General IQ	-0.052

** The correlation is significant at the: 0.01; * the correlation is significant at the 0.05

DISCUSSION

This research proposed to establish the relationship between autism spectrum problems, attention deficit, anxious symptoms, and IQ in children from 2 to 5 years of age, for which a review of the literature on these variables was made, followed by the application of the instruments and data analysis.

From the results corresponding to the association between autism spectrum problems, attention deficit, anxious symptomatology, and IQ, it was obtained that, for IQ, the processing speed index was related to autism spectrum problems, while the rest of the variables were not related to IQ indexes.

The correlation found indicates that children with autistic symptomatology may present difficulty in inhibiting responses, requiring more time to process information and carry out certain

tasks (44). These results are in line with previous studies, such as that of Mayes and Calhoun (18) and Wechsler (45) who demonstrated that autistic children may present difficulties in processing speed, which are often present throughout life. Similarly, Ogiwara and Takahashi (46) mention that approximately 25 % to 55 % of children with these difficulties have difficulty in certain axes that allow the evaluation of IQ.

In this sense, Oliveras-Rentas et al. (47) observed the profile of a group of children with autistic problems by means of the WISC-IV, where they found that there were difficulties in terms of processing speed and comprehension. Likewise, Travers et al. (31) evaluated processing speed, finding lower performance in people with autism spectrum disorders.

These findings could be because the same diagnostic typologies as the neurological alterations present in the autism spectrum have repercussions on neuropsychological performance. Thus evidencing difficulties in executive functions, memory, and processing speed (48).

Finally, this research allows health professionals and professionals from the Social and Human Sciences, feasibility to better understand intellectual diversity in early childhood, in addition to the analysis of multiple causes and factors, which could bring implications for the field of research, clinical psychology, neurology and education (49).

This study shows some limitations; on the one hand, the representativeness of the sample cannot be guaranteed due to the sampling technique used. In addition, the collection of information could not be carried out in person due to the situation of confinement by COVID-19 in 2020, which was a restriction as it was not possible to have more participants. However, it could be solved by carrying out the work by telephone according to the availability of the participants.

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REFERENCES

1. Myers R. The twelve who survive: Strengthening early childhood development programs in the third world. Pan American Health Organization. Washington D.C. USA. Scientific Publication 545. 1996;431.
2. Wechsler D. The measurement and appraisal of adult intelligence. 4th edition. Baltimore: Williams & Wilkins; 1958:49-58.
3. Jaraba R, Ruiz U, Navarro-Obeid J. Measuring emotional perception and emotional perception in children with ADHD and ODD. Book Eight Mental Health Studies. 2019;73-95.
4. Meza Cueto L, Palacio Sañudo J, Navarro-Obeid J, Vergara Álvarez M, Navarro D. Differences in the levels of adaptation, social support, and family functionality according to the sex, age, and school grade of children and adolescents affected by winter in Sucre, Colombia. *Gac Méd Caracas*. 2022;130(3S):S503-S513.
5. Acosta Mesa E, Alean Pico A, Prieto Flórez J, Tordecilla V. Sucre in some figures and basic data. Book Notes on Law and Justice in a globalized world, 2020:13-21.
6. Virues-Ortega J, Rodríguez V, Yu C. Prediction of treatment outcomes and longitudinal analysis in children with autism undergoing intensive behavioral intervention. *Internat J Clin Health Psychol*. 2013;13(2):91-100.
7. Manterola A, Avendaño Bertoló A, Valenzuela Yuraidini C, Avendaño P, Cotroneo J. Neurological examination and school performance: correlations at seven years Deadline. *Rev Chil Pediatr*. 1989:157-165.
8. Ochoa-Martínez L, Díaz-Neri N. Implementation of a digital narrative to facilitate the learning of fractions in elementary school. *J Res Develop Innov* 2021;11(3): 533-544.
9. Egger HL, Angold A. Common emotional and behavioral disorders in preschool children: Presentation, nosology, and epidemiology. *J Child Psychol Psychiat*. 2006;47(3-4):313-337.
10. Carter S. The field of toddler/preschool mental health has arrived--on a global scale. *J Am Acad Child Adolesc Psychiat*. 2010;49:1181-1182.
11. Ivanova MY, Achenbach TM, Rescorla LA, Harder VS, Ang RP, Bilenberg N, et al. Preschool psychopathology reported by parents in 23 societies: Testing the seven-syndrome model of the child behavior checklist for ages 1.5-5. *J Am Acad Child Adolesc Psych*. 2010;49(12):1215-1224.
12. Center for Disease Control and Prevention (CDC). Facts and statistics on autism spectrum disorder. 2020.
13. Carter Black S, Tewani Connolly H, Tager-Flusberg R. Sex differences in young children with autism spectrum disorders. *J Autism Develop Dis*. 2007;37:86-97.
14. American Psychiatric Association. Diagnostic criteria reference guide the DSM-5. Madrid: Editorial Médica Panamericana; 2013.
15. Matson JL, Shoemaker M. Intellectual disability and its relationship to autism spectrum disorders. *Research in Developmental Disabilities*. 2009;30(6):1107-1114.
16. Mayes D, Calhoun L, Murray J, Morrow J, Yurich, Mahr F, Petersen C. Comparison of scores on the checklist for autism spectrum disorder, childhood autism rating scale, and gilliam asperger's disorder scale for children with low functioning autism, high functioning autism, Asperger's disorder, ADHD, and typical development. *J Autism Develop Disorders*. 2009;39(12):1682-1693.
17. Bartak L, Rutter M. Differences between mentally retarded and normally intelligent autistic children. *J Autism Childhood Schizophrenia*. 1976;6:109-120.
18. Mayes S, Calhoun S. Impact of IQ, age, SES, gender, and race on autistic symptoms. *Research in Autism Spectrum Disorders*. 2009;5(2):749-757.
19. Matson, J Shoemaker M. Intellectual disability and its relationship to autism spectrum disorders. *Res Develop Disabil*. 2009;30(6):1107-1114.
20. Bishop S, Richler J, Lord C. Association between restricted and repetitive behaviors and nonverbal IQ in children with autism spectrum disorders. *Child Neuropsychol*. 2006;12(4-5):247-267.
21. Lord C, Schopler E. Stability of assessment results of autistic and non-autistic language-impaired children from preschool years to early school age. *J Child Psychol Psychiat*. 1989;30(4):575-590.
22. Solomon M, Iosif A, Reinhardt V, Libero L, Nordahl C, Ozonoff S. What will my child's future hold? Phenotypes of intellectual development in 2-8 year-olds with autism spectrum disorder. *Autism Res*. 2018;11:121-132.
23. Duffy C, Healy O. Spontaneous communication in autism spectrum disorder: A review of topographies and interventions. *Res Autism Spectrum Disorders*. 2011;5(3):977-983.
24. Kaland N. Brief report: Should Asperger syndrome be excluded from the forthcoming DSMV? *Res Autism Spectrum Disorders*. 2011;5(3):984-989.
25. Mazurek M. The history of comorbidity in autism spectrum disorder. In: Matson JL, editor. *Comorbid*

- conditions among children with autism spectrum disorders. Louisiana: Springer; 2016.p.3-27.
26. Martos-Pérez J, Freire-Prudencio S, Llorente-Comí M, Ayuda-Pascual R, González-Navarro A. Autism and IQ: stability? *Rev Neurol.* 2018;66(Supl 1):S39-44.
 27. Bate AJ, Mathias JL, Crawford JR. Performance of the Test of Everyday Attention and standard tests of attention following severe traumatic brain injury. *Clin Neuropsychol.* 2001;15:405-422.
 28. Barkley R. The Nature of ADHD. In: Barkley RA, editor. *Attention-Deficit Hyperactivity Disorder: A Handbook for Diagnosis and Treatment (third.)*. New York: Guilford Press; 2006.
 29. Bernal-Pinzón M. ¿What do children write, a view from the new school model. *Rev Inves Desarr Innov.* 2017;7(2):255-268.
 30. Al-Salehi SM, Al-Hifthy EH, Ghaziuddin M. Autism in Saudi Arabia: presentation, clinical correlates, and comorbidity. *Transcultural Psychiat.* 2009;46(2):340-347.
 31. Travers B, Bigler E, Tromp D, Alduru N, Froelich A, Ennis C. Longitudinal processing speed impairments in males with autism and the effects of white matter microstructure. *Neuropsychologia.* 2014;53:137-145.
 32. Whalen DJ, Sylvester CM, Luby JL. Depression and anxiety in preschoolers: A review of the past 7 years. *Child and Adolescent Psychiatric Clin.* 2017;26(3):503-522.
 33. Arroyo-Alvis K, Allegri R, Barcelo E. Brain training with neurofeedback in patients with mild cognitive impairment: A review study. *Gac Méd Caracas.* 2022;130(3S):S524-S525.
 34. Billeiter K, Froiland J. Diversity of intelligence is the norm within the autism spectrum: Full-scale intelligence scores among children with ASD. *Child Psychiat Human Development.* 2022:1-8.
 35. Shamir-Essakow G, Ungerer J.A, Rapee RM. Attachment, behavioral inhibition, and anxiety in preschool children. *J Abnormal Child Psychol.* 2005;33:131-143.
 36. Battaglia C, Cuevas A, De Wolf S. High-efficiency crystalline silicon solar cells: status and perspectives. *Energy Environm Sci.* 2016;9(5):1552-1576.
 37. Franco M. *Mental and Behavioral Disorders in Mental Retardation. Assessment and Intervention.* Zamora: Edintras; 1998.
 38. Menolascino F. Psychiatric disorders in the mentally retarded: Types, problems, and challenges. *Am J Psychiat.* 1982;139(10):1297-1303.
 39. Bollini S, Gentili C, Tasso R, Cancedda R. The regenerative role of the fetal and adult stem cell secretome. *J Clin Med.* 2013;2(4):302-327.
 40. Ayuso J, Martorell A, Novell R, Salvador-Carulla L, Tamarit J. *Intellectual Disability and Mental Health: A Practical Guide.* Madrid. 2007.
 41. Weems C F, Costa N M, Watts S E, Taylor L K, Cannon M F. Cognitive errors, anxiety sensitivity, and anxiety control beliefs: Their unique and specific associations with childhood anxiety symptoms. *Behavior Modification.* 2007; 31(2): 174-201.
 42. Achenbach M, Rescorla A. *Manual for the ASEBA preschool forms and profiles.* Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families. 2000.
 43. Hernández R, Fernández C, Baptista P. *Research Design.* México: ediciones Mc. Graw Hill; 2014.
 44. Merchán-Naranjo J, Boada, del Rey-Mejías Á, Mayoral M, Llorente C, Arango C, Parellada M. Executive function is impaired in autism spectrum disorders, but this does not correlate with intelligence. *J Psych Mental Health.* 2016;9(1):39-50.
 45. Wechsler D. *WISC-IV technical and interpretive manual.* Psychological Corporation, 2003.
 46. Ogiwara H, Takahashi O. Changes in developmental and intelligence quotients in children with autism. *Japan J Child Adolesc Psychiat.* 2005;46(4):439-448.
 47. Oliveras-Rentas R, Kenworthy L, Roberson R, Martin A, Wallace G. WISC-IV profile in high-functioning autism spectrum disorders: impaired processing speed is associated with increased autism communication symptoms and decreased adaptive communication abilities. *J Autism Develop Dis.* 2012;42(5):655-664.
 48. Peña P, Suárez I, Rodríguez V, Santana G, Expósito S. Children with Autism Spectrum Disorder have deficits in Executive Functions. *J Child Adolesc Psychiat.* 2016;33(3):385-396.
 49. Billeiter K, Froiland J. Diversity of Intelligence is the Norm Within the Autism Spectrum: Full-Scale Intelligence Scores Among Children with ASD. *Child Psych Human Develop.* 2022:1-8.

Caregiving and parenting practices during mandatory confinement by COVID-19 of early childhood caregivers

Prácticas de crianza y cuidado durante confinamiento obligatorio por COVID-19 de cuidadores de primera infancia

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SUMMARY

Introduction: During the COVID-19 infection, the population of infants and adolescents has been the most affected in aspects such as health, adequate nutrition, responsive care, protection, and safety, among others.

Objective: To describe the care and upbringing practices of early childhood caregivers during compulsory confinement, from the point of view of health, nutrition, and psycho-pedagogical support.

Method: Quantitative, descriptive research with 283 caregivers of early childhood children in a CDI child development center in Sincelejo, using instruments such as a sociodemographic questionnaire and a questionnaire on 14 care and upbringing practices proposed by the Colombian Institute of Family Welfare ICBF (2021).

Results: Caregivers made a significant accompaniment in the health and nutrition component, as well as in the psycho-pedagogical component (75%), however, about 25% of caregivers at an average level complied with the practices of both components.

Conclusion: During a health emergency, the practices to guarantee the integral development of early childhood children are complied with.

Keywords: Early childhood, caregivers, care and upbringing practices, compulsory confinement, COVID-19.

RESUMEN

Introducción: Durante la infección por COVID-19 la población de infantes y adolescentes han sido los más afectados en aspectos como salud, nutrición adecuada, atención receptiva, protección, seguridad, entre otros.

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Objetivo: *Describir las prácticas de cuidado y crianza de los cuidadores de niños y niñas de la primera infancia durante el confinamiento obligatorio, desde el acompañamiento en salud y nutrición y psicopedagógico.*

Método: *Investigación cuantitativa, tipo descriptiva con 283 cuidadores(as) de niños y niñas de la primera infancia de un centro de desarrollo infantil CDI de Sincelejo y se utilizaron instrumentos como cuestionario sociodemográfico y uno sobre 14 prácticas de cuidado y crianza propuesto por el Instituto Colombiano de Bienestar Familiar ICBF (2021).*

Resultados: *Los cuidadores hicieron un acompañamiento significativo en el componente de salud y nutrición, al igual que en el psicopedagógico (75 %), sin embargo, alrededor del 25 % de los y las cuidadores(as) en un nivel medio cumplieron con las prácticas de ambos componentes.*

Conclusión: *En medio de la emergencia sanitaria se cumplan con las prácticas para garantizar el desarrollo integral de los niños y niñas de la primera infancia.*

Palabras clave: *Primera infancia, cuidadores, prácticas de cuidado y crianza, confinamiento obligatorio, COVID-19.*

INTRODUCTION

The COVID-19 pandemic generated a health and economic crisis that has had effects on the entire population (1), but early childhood children have perhaps been the most invisibilized and harmed population during the compulsory confinement measures adopted due to the risks they were exposed to and the vulnerable situations such as increased poverty, exploitation, violence, mental health problems, food, inadequate provision of health services, modifications in care, child-rearing practices, increased educational gaps (1).

Before the pandemic, Latin America had high rates of poverty, increasing during the COVID-19 pandemic, with early childhood children being the most affected in this and other aspects such as good health, adequate nutrition, responsive care, protection, and security, and opportunities for early learning (2), a situation that affects their mental health and development. The economic impact generated by a pandemic increases the situation of poverty, where living in such a state for long periods aggravates social problems,

having negative effects on mental health and the development of the life cycle of children (2,3).

During the COVID-19 infection, the population of infants and adolescents has not been the age group that has claimed the most victims, but the measures adopted led to difficult access to food, feeding programs, vaccination, increased risk of malnutrition, limited access to health and nutrition controls (2-4), as well as the implementation of unhealthy care practices such as sedentary lifestyles and unhealthy eating (5); events that can trigger increased deaths in children, as well as in pregnant and lactating mothers (6). The implementation of control measures during the health emergency has had other consequences in early childhood, where the right to play freely with their peers was violated by the protection measures taken, which broke into their daily lives, altering their emotional bonds and making them susceptible to difficulties related to learning, behavior, physical and mental well-being (7).

The restrictions in the educational scenario caused lost learning and therefore affected the development of cognitive skills, given that education in preschool children is manipulative, experiential, and social; as well as the limited contact with peers, the lack of exploration of the environment, which is necessary for the evolutionary period in which early childhood is found, affected the acquisition of social skills (8). The education gap increases in poor communities, in those who do not have access to technological resources, added to the age of early childhood, the nature of the curriculum by developmental areas, the lack of digital skills of the teacher who serves the preschool population, in addition to the help of parents for the use of digital devices (9,10).

Education in times of compulsory confinement was supported by the caregivers or the family, which implied an effort on their part because they continued to work from home, this being an exhausting, laborious, and painful period for the adult, but much harder, complex and severe for the children. A period where caregivers and children shared the same space, time, and problems that arose from coexistence, while they were productive at work and had to support the infants in their educational activities, especially those in early education (8,10-11). The evidence

shows that caregivers during the mandatory confinement by COVID-19 presented stress and feelings of sadness due to the events caused by the pandemic such as confinement, economic difficulties, and work; for their part, children in early childhood, the longer the isolation lasted, showed more behavioral problems, such as aggressiveness and defiant behavior, but also anxiety and attention problems. However, the children's behavior could be related to parental care, since they were more concerned about the welfare of infants who exercise greater control over their behavior (5).

Early childhood children were the big losers in this transition to online education because it was believed that the implementation of digital screens allows education without problems, not understanding the changes typical of their stage (13), in addition, they had behavioral and mood changes during the period of mandatory confinement, being this a fundamental stage for the development of the child; all this stressful experience in addition to the loss of caregivers has effects on future generations, at the physiological, sociological and epigenetic levels that occur in utero and the early years (3). Families were negatively affected by the pandemic which made parents exercise more control over the children, but despite the negative aspects there was also a positive perception of the family because of the time shared (5), but to date, there are no studies on the care and parenting practices implemented by parents during mandatory confinement. Therefore, this research aims to describe the care and upbringing practices of the caregivers of early childhood children during compulsory confinement, identifying the support provided by the caregivers in the health and nutrition of the children, as well as detailing the support provided by the psycho-pedagogical point of view.

Care and upbringing practices

These practices refer to the actions that parents, caregivers, and community members carry out so that children grow up safely, have a good development, and learn and guide them to establish their identity and social development. Care and upbringing are based on the understanding of the roles of the child, i.e., who is the child, accor-

ding to his or her social, cultural, context, belief system, and aspects valued by the culture. The actions of daily life throughout the life cycle are a sample of the care and upbringing practices developed by communities and caregivers, which are determining factors in the way children relate to each other and in their growth and development. However, these practices should not violate the rights of minors on the contrary they should recognize them, in addition to strengthening growth considering the cultural perspective, promote the achievements of children's growth in the physical, cognitive, emotional, personality, and social dimensions, in addition to facilitating self-recognition as a member of a community and ethnic group (14).

Therefore, in early childhood care modalities, the care and upbringing practices that are developed from family and community contexts should be experienced and complementary to the pedagogical component, to promote them, strengthen them, and allow the child to create identification with his or her culture (14). For their part, parenting practices allow:

- Construction of bonds and interactions.
- Forms of communication and language
- Transmission of values and cultural knowledge.

Care practices

These practices are part of the daily occurrence of subjects and fundamental for the healthy development of children; therefore, in pedagogical practice and different moments such as feeding, hygiene, rest, sharing with peers and adults, expression of affection, etc. are significant for the development of independence, autonomy, conflict resolution, decision making. Each of these actions must recognize, estimate, respect, and meet the needs and requirements of boys and girls (14). Among the care practices that are held in a modality of early childhood care are:

- Feeding
- Hygiene
- Rest
- Physical and spiritual health
- Good treatment

METHOD

Type of Research

This research is of quantitative design, with a descriptive scope because a record and description are made of the behavior of the variables that are observed in a lapse of time in a group (15); in that sense the practices of care and upbringing from the accompaniment in the aspects of health and nutrition and psycho-pedagogical that had the caregivers of the children of early childhood during the period of compulsory confinement by COVID-19 of the year 2020.

Participants

A total of 283 caregivers of early childhood children belonging to a CDI (Centros de Desarrollo Infantil) child development center in the municipality of Sincelejo, who gave their consent to participate in the study.

Instruments

Two instruments were used: a sociodemographic questionnaire to identify the characteristics of children in early childhood, and an instrument that describes the care and upbringing practices from the point of view of the caregivers' accompaniment in the aspects of health and nutrition and psycho-pedagogical accompaniment; It is important to point out that the instrument includes the 14 care and upbringing practices that the Colombian Institute of Family Welfare ICBF (16) establishes should continue to be implemented during the health emergency to guarantee the development of the strategy of care and upbringing experiences at home and psychosocial accompaniment, in addition to guaranteeing compliance with practices that are related to the quality initial education component in the framework of comprehensive care.

The practices are related to the actions that families can develop and strengthen during mandatory confinement, the first nine practices refer to care, health, hygiene, accident prevention, and promotion of adequate eating habits; the remaining five practices are oriented to the

empowerment of child development, which are the enjoyment of guiding activities, construction of identity, development of autonomy, construction of rules and limits, the experience of sensitive and welcoming interactions (16). As for the way of quantifying the information, it was done in low, medium, and high, which indicates the level of compliance with the 14 practices developed by the family during the health emergency.

To carry out this process of describing the care and upbringing practices in the home, six monthly calls of approximately 15 minutes were made to promote and accompany the practices, in addition to the virtual pedagogical meetings, which were held once a week (16). Data analysis was carried out using Statistical Package for Social Science (SPSS) V. 20 to calculate the means, frequencies, and percentages of compliance with the 14 care and parenting practices implemented by the families during the health emergency.

RESULTS

The data obtained from the 283 caregivers of early childhood children who participated in the study showed that 48.1 % were female, 51.9 % were male, the most frequent age range was 2 years with 38.2 % and the age group with the highest percentage was an infant with 35.7 % (Table 1).

Table 1. Sociodemographic Data

Variables	Group	Frequency	Percentage
Gender	Female	136	48.1
	Male	147	51.9
Age	1	39	13.8
	2	108	38.2
	3	75	26.5
	4	47	16.6
Age Group	Lost System	14	4.9
	Pre-Kindergarten	66	23.3
	Nursery	101	35.7
	Kindergarten	48	17.0
	Walkers	26	9.2
	Lost System	42	14.8

CAREGIVING AND PARENTING PRACTICES

It was evidenced that the Accompaniment in Health and Nutrition was fulfilled at a medium level by 25 % of caregivers, meaning that not all caregivers offer food to the child with the required variety to be adequate, as well as the preparation of food with colors, flavors, smells and different textures that allow the enjoyment and exploration of the children was not performed in all homes. Similarly, accompanying the feeding moments of children to share, communicate, explore, and thus provide care, health, hygiene,

prevention of accidents, and promotion of proper eating habits was fulfilled at an average level by 26.9 % of caregivers. Assistance to the doctor to improve the nutritional status of the child when malnutrition occurs was at a medium level for 28.6 % of caregivers; on the other hand, providing support to pregnant and postpartum women with adequate care was medium for 45.9 % and low for 4 %, indicating that mothers and female caregivers did not receive help during and after the pregnancy period (Table 2).

Table 2. Health and Nutrition Accompaniment

Variable	Level	Frequency	Percentage
To adequately feed children according to their developmental characteristics	Medium	79	27.9
	High	204	72.1
Adopt healthy food preparation, handling, preservation, and consumption measures.	Medium	74	26.1
	High	209	73.9
Ensure that children receive the care necessary for good health.	Medium	81	28.6
	High	202	71.4
To support pregnant and postpartum women with appropriate care.	Under	1	0.4
	Medium	130	45.9
	High	152	53.7
Wash hands with soap and water at key moments.	Medium	65	23.0
	High	218	77.0
Keeping the house clean and providing adequate treatment for excreta, sewage, and solid waste.	Medium	78	27.6
	High	205	72.4
Protect the family from flies, cockroaches, rats, mosquitoes, bats, and other animals that pose a health hazard.	Medium	78	27.6
	High	205	72.4
Take appropriate measures to have safe water for consumption and personal hygiene.	Medium	67	23.7
	High	216	76.3
Take appropriate measures to prevent accidents in the home and its environment.	Medium	76	26.9
	High	207	73.1

In terms of psycho-pedagogical support, about 25% of the caregivers comply at a medium level with the measures of psycho-pedagogical support, that is, the caregivers do not perform listening practices, reading signals and questions to the

children to make decisions in family life, which help the development of autonomy, and also do not promote independent actions that support the effort and achievements of the children through words of praise and affectionate gestures (Table 3).

Table 3. Psycho-pedagogical support

Variable	Level	Frequency	Percentage
Accompany the development of children's autonomy.	Under	1	0.4
	Medium	48	17.0
	High	234	82.7
Accompanying the construction of identity	Medium	68	24.0
	High	215	76.0
Promote the construction of norms and limits.	Medium	68	24.0
	High	215	76.0
Generates experiences for the enjoyment of play, creation, exploration, and literature with children from gestation.	Under	1	0.4
	Medium	55	19.4
	High	227	80.2
Experience sensitive and nurturing interactions with children from gestation onwards sensitive and nurturing interactions with children from gestation onwards sensitive and nurturing interactions with children from gestation onwards	Medium	61	21.6
	High	222	78.4

DISCUSSION

The COVID-19 pandemic has been a phenomenon that has changed the social dynamics worldwide and as measures to protect citizens, the Colombian government decreed mandatory confinement at the national level in 2020 and 2021, which meant that people had to stay in their places of residence all day long. Meanwhile, parents had to interact with their children twenty-four hours a day, in some cases when their work had to be done at home because of the confinement, which in a certain way meant that the attention to their children was not constant.

In the case of parents who had children in early childhood, they had to implement child-rearing practices that responded to the public health situation that was being experienced worldwide and that allowed the infant to acquire beliefs and behaviors according to his development but within the local space where he was, according to this (10-17) emphasize that during the confinement the families could strengthen their dynamics because they had more time to interact, which facilitated the play spaces at home.

In view of the above, during the mandatory confinement by COVID-19 the centers that provided early childhood care had to suspend their

services in person, i.e., the Children's Homes, CDI, Schools, and Educational Institutions did not carry out their activities in the usual spaces, which is why it was necessary to establish new support strategies. Accordingly, early childhood care had to be adjusted to the needs of the context, where parents or relatives took a leading role in the care of early childhood children (1-18).

From the results obtained in the present study, it was evident that the care and upbringing practices that prevailed among early childhood caregivers during mandatory confinement were directed towards psycho-pedagogical accompaniment, as well as the preservation of health and nutrition. This is line with Manterola and Otzen (15) who stated that caregivers during the days of preventive isolation for COVID-19 have to strengthen care and parenting practices in children, considering that staying at home requires a direct link between the caregiver and the infant.

The practices of care and upbringing are directed towards acts related to a belief or custom that seeks to energize in children "the growing well, development and learning of girls and boys, as well as to guide and cement the foundations of their identity and social belonging" (14). Consequently, these practices are part of the daily life of caregivers so it makes the teaching-learning experience more comforting, which is

why, for infants “moments of feeding, hygiene, rest, sharing, expression of affection, among others, constitute countless opportunities to exercise autonomy, participation, decision making, conflict resolution” (14).

During the quarantine or mandatory confinement, it was evidenced that caregivers presented a favorable perception based on the parenting guidelines carried with their children, as well as the positive interrelationship with them despite the negative effects brought about by the pandemic (5-16-20). This is articulated with what was evidenced in the present study, where it was shown that the caregivers evaluated had a significant accompaniment for the proper development of children, where their practices were directed to promote good eating habits, care for good health, experiences for the enjoyment of play, creation, exploration, literature, and clean and safe spaces at home.

The Colombian Institute of Family Welfare highlights that during compulsory confinement, activities should be carried out at home that promote child development, hence the importance of care practices in the home modality to promote, recognize, value, welcome, and meet the needs and requirements of children in early childhood (21).

Finally, the caregivers of early childhood children during the mandatory confinement due to the pandemic provided adequate care so that the infants could develop their competencies and skills even while at home. The caregivers' experience was also pedagogical, since their care and upbringing practices strengthened the children's social ties from the daily life of their families, thus allowing the construction of their identity, sense of belonging, and self-care guidelines.

CONCLUSION

The study shows that caregivers employed significant care and parenting practices during preventive isolation, both in the psycho-pedagogical component and in health and nutrition, despite all the changes brought about

by the COVID-19 pandemic, parents sought to ensure the comprehensive development of children during confinement.

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Declaration of conflict of interest

The authors declare that there is no conflict of interest.

Authors' contributions

The first author: conceived the research, helped write the article, and applied instruments.

The second author: conceived the research, helped write the article, and analyzed the data.

The third author: conceived the research, helped write the article, and analyzed the data.

The fourth author: conducted the literature search, applied instruments, and assisted in editing the article.

The fifth author: Searched for bibliographic information and assisted in writing the article.

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REFERENCES

1. Armus M, Factorovich M, Quesada J, Raineri F. Early childhood: Emotional impact on the pandemic. Interagency Early Childhood and Integrated System of Care Program, 2021. Retrieved from <https://www.unicef.org/argentina/media/10606/file/Primera%20infancia.%20Impacto%20emocional%20en%20la%20pandemia%20.pdf>.

2. Castillo C, Marinho ML. Los impactos de la pandemia sobre la salud y el bienestar de niños y niñas en América Latina y el Caribe. Cepal.org. 2022. Retrieved from https://repositorio.cepal.org/bitstream/handle/11362/47806/1/S2200064_es.pdf.
3. Yoshikawa H, Wuermli AJ, Britto PR, Dreyer B, Leckman JF, Lye SJ, et al. Effects of the global Coronavirus disease-2019 pandemic on early childhood development: Short- and long-term risks and mitigating program and policy actions. *J Pediatr*. 2020;223:188-193.
4. Osendarp S, Akuoku JK, Black RE, Headey D, Ruel M, Scott N, et al. The COVID-19 crisis will exacerbate maternal and child undernutrition and child mortality in low- and middle-income countries. *Nat Food*. 2021;2(7):476-484.
5. Romero-Acosta K, Fonseca-Beltrán L, Doria-Dávila D, Herazo-Chamorro M, Pérez-Vásquez D. Estado emocional de cuidadores y de niños preescolares: antes y durante la cuarentena por COVID-19. *Duazary*. 2022;19(2):85-94.
6. Robertson T, Carter ED, Chou VB, Stegmuller AR, Jackson BD, Tam Y, et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modeling study. *Lancet Glob Health*. 2020;8(7):e901-908.
7. Castillo C. The forgotten victims of the pandemic: children and adolescents. COVID-19 Pandemic: the right to study of children and adolescents in Latin America and the Caribbean. Cepal. 2021. Retrieved from <https://www.cepal.org/es/enfoques/victimas-olvidadas-lapandemia-ninas-ninos-adolescentes>.
8. Moreno JM, Gortazar L. Schooling in Confinement: Natural experiment and stress test. *Profesorado, Revista de Currículum y Formación del Profesorado*. 2020;24(2):168-181.
9. Saldaña J. Early childhood education and online teaching during confinement: experiences and good practices. *Rev Científica Electrónica de Educación y Comunicación en la Sociedad del Conocimiento*. 2020;24(2):168-181.
10. Castro Cárdenas T. Strengthening family and education in the COVID-19 context. *Padres y Maestros. J Parents Teachers*. 2020;(384):57-63.
11. Hortigüela-Alcalá D, Pérez-Pueyo Á, López-Aguado M, Manso-Ayuso J, Fernández-Río J. Familias y Docentes: Garantes del Aprendizaje durante el Confinamiento. *Rev Int Educ Para Justicia Soc*. 2020;9(3):353-370.
12. Castro Zubizarreta A, Valcárcel-Delgado V. Voces de la primera infancia durante el confinamiento español por la COVID-19. *Rev Latinoam Cienc Soc Niñez Juv*. 2022;20(2):1-24.
13. García Aretio L. COVID-19 y educación a distancia digital: preconfinamiento, confinamiento y posconfinamiento. *Rev Iberoam Educ Distancia*. 2020;24(1):09.
14. Ministerio de Educación Nacional y la Organización de Estados Iberoamericanos – OEI. Caregiving and parenting practices. Mineducación. 2018. Retrieved from https://redes.colombiaaprende.edu.co/ntg/men/pdf/Practicas_de_Cuidado.pdf
15. Manterola C, Otzen T. Estudios Observacionales: Los Diseños Utilizados con Mayor Frecuencia en Investigación Clínica. *Int J Morphol*. 2014;32(2):634-645.
16. Instituto Colombiano de Bienestar Familiar ICBF. Experiences of home care and parenting in times of coronavirus. 2021. Retrieved from https://www.icbf.gov.co/system/files/web_experiencias_de_cuidado_y_crianza_en_el_hogar.pdf
17. Clark H, Coll-Seck AM, Banerjee A, Peterson S, Dalgligh SL, Ameratunga S, et al. A future for the world's children? A WHO-UNICEF-Lancet Commission. *Lancet*. 2020;395(10224):605-658.
18. Aguirre E. Socialization and parenting practices. In: Aguirre E, Durán E, editors. *Socialización: Prácticas de Crianza y cuidado de la salud*. Universidad Nacional de Colombia. Health. 2000.p.17-92.
19. Perez E, Alemán I, Cancio G, Herazo M, García L, Mendivil P. Typological characterization of child sexual abusers from court records. *Gac Méd Caracas*. 2022;130(3S):S588-S594.
20. Instituto Colombiano de Bienestar Familiar ICBF. Annex of technical, technical, operational and financial guidelines for the remote provision of early childhood care services of the ICBF, in view of the declaration of health emergency decreed by the national government of Colombia due to COVID-19. Version 3. 2021. Retrieved from https://www.icbf.gov.co/system/files/procesos/a1.lm5_.pp_anexo_de_orientaciones_tecnicas_operativas_y_financieras_para_la_prestacion_remota_de_los_servicios_de_atencion_a_la_primera_infancia_del_icbf_v3.pdf
21. Kuric Kardelis S, Calderón Gómez D, Sannmartín Ortí A. Educación y brecha digital en tiempos del COVID-19. Perfiles y problemáticas experimentadas por el alumnado juvenil para continuar sus estudios durante el confinamiento. *Rev Sociol Educ-RASE*. 2021;14(1):63-84.

Perception of the benefits of companion animals during the time of quarantine by COVID-19 in a sample of inhabitants of the city of Medellín, Colombia

Percepción sobre los beneficios de la compañía de mascotas durante la cuarentena por COVID-19 en una muestra de población de la ciudad de Medellín, Colombia

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SUMMARY

The present study aimed to identify the perception of the benefits derived from the company of pets during the quarantine by COVID-19 in a sample of the Medellín city population, Colombia. A quantitative, descriptive, ex post facto study was used, with the participation of 141 people, 73 % women (n=102) and 27 % men (n=39), with an average age of M=35.2 (SD =8.4). The variables of human-animal interaction, emotional closeness with the pet, physical and psychological benefits, and perceived cost were evaluated through an ad-hoc Likert-type questionnaire with Alpha Cronbach 9.79. The results indicate that the study participants have a high perception of the psychological and

physical benefits and a high emotional closeness with their pets during the quarantine by COVID-19. This perception was independent of the variables of gender, age, occupation, educational level, economic level, and type of pet. The perception of physical benefits was related to the type of pet, being higher in the case of dogs. It is concluded that the company of pets represented a positive contribution to the mental health of the study participants in the situation of social distancing during quarantine.

Keywords: *Pet company benefits, social distancing, quarantine, COVID-19.*

RESUMEN

El presente estudio se orientó a evaluar acerca de la percepción acerca de los beneficios derivados de

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la compañía de las mascotas durante la cuarentena obligatoria por COVID-19 en una muestra de habitantes de la ciudad de Medellín, Colombia. Se empleó un estudio cuantitativo, descriptivo, ex post facto, con la participación de 141 personas, siendo 73 % mujeres (n=102) y 27 % hombres (n=39), con la edad promedio de M=35,2 (Dt =8,4). Se evaluaron las variables de interacción humano-animal, cercanía emocional con la mascota, beneficios a nivel físico, psicológico y costo percibido, mediante un cuestionario ad-hoc tipo Likert, que mostró un Alfa Cronbach de 0,79. Los resultados indican un alto grado de percepción por parte de los participantes del estudio sobre los beneficios a nivel psicológico y físico y una alta cercanía emocional con sus mascotas durante el tiempo de cuarentena obligatoria por COVID-19. Dicha valoración alta fue independiente de las variables de género, edad, ocupación, nivel educativo, nivel de ingresos y tipo de mascota. La percepción de beneficios a nivel físico se relacionó con tipo de mascota, siendo más alta en caso de los perros. Se concluye que la compañía de mascotas representó un aporte positivo para la salud mental de los participantes del estudio en la situación de distanciamiento social durante la cuarentena.

Palabras clave: *Beneficios de compañía de mascotas, distanciamiento social, cuarentena, COVID-19.*

INTRODUCTION

The COVID-19 pandemic that took place at the beginning of 2020 brought with it many changes in people's lives, including major mental health effects (1). Immersed in the pandemic scenario, more specifically within the framework of mandatory confinement and the total cessation of all activities that required some type of displacement or interaction, a series of problems arose in the field of mental health derived from a limitation in freedom of movement, which in a normal context helps to maintain an individual's mental status quo, these problems range from isolated symptoms to anxiety disorders, depression, post-traumatic stress disorder, and sleep disorders (2).

It affirms that those psychosocial alterations that can occur in a state of a sanitary and public health emergency, such as a pandemic, originating from the impossibility to carry out any activity resulting from the disease as such or from the state of isolation, generating in the individual a state

of hopelessness, helplessness and uncertainty with the risk of configuring a state of mourning or a state of anguish due to the stress produced by the same situation (3).

It is also pertinent to take into account that, due to compulsory isolation, the fact of having to abandon habits or change them abruptly, causes psychological and physical effects on the individual as well as the establishment of new unhealthy habits such as bad eating habits, sedentary lifestyle and greater use of screens (4).

In this order of ideas, within the context of social distancing related to the confinement and quarantine to which the world was subjected for almost the entirety of 2020, and considering the devastating effect on mental health produced by this, it is important to focus attention on a human-animal relationship issue, because animals of different breeds have lived with humans throughout history and have become part of the culture and daily coexistence, often being considered as members of families that they share the lives of their owners for many years and that in turn help to elaborate certain personal duels as social support (5). Throughout history, the impact of animals on mental and physical health in older adults plays a fundamental role because it constitutes support and accompaniment to the human being, to the human-animal relationship (6).

The authors highlight that pets considerably reduce psychological conditions, as well as the feeling of loneliness, and enhance the intimate feeling of conservation of life, especially in situations of uncertainty. When the individual is in the state associated with coping with losses or we are in a state of mind related to stress and anxiety, pets represent a source of accompaniment that reinforces self-esteem and a sense of belonging to oneself and others. In cancer patients, pets manage to improve survival, improving the quality of life and health of these patients (7).

Those responsible for companion pets can perceive that these offer benefits for mental, social, and physical well-being within the framework of a commitment to the subject's health (8). Based on the theory of social exchange, refers to the benefit of the human-animal bond in three spheres: social interaction, emotional

bond, and perceived cost. Among the benefits contained in this theory are acceptance, affection, love, social support, improvements in social skills, and positive effects on physiological and psychological aspects.

Pets have been found to provide some protection against cardiovascular disease by regulating the functioning of the respiratory systems, heart rates, stress, and anxiety. Petting a pet decreases the concentration of cortisol in the body and increases dopamine, endorphin, prolactin, and oxytocin, thus triggering a feeling of tranquillity and calm that is reflected in the mood of each individual. For children, the company of pets helps to develop a healthy affection, conveying a sense of tranquillity and well-being, in addition to this, interaction with pets allows to reduce feelings of loneliness and anxiety in social relationships (9).

Likewise, the company of pets is beneficial in moments of social anxiety or high levels of stress, enabling the production of oxytocin, a hormone that serves to mitigate these negative states and helps to reduce the symptoms linked to this moment, thus favouring the social interaction to the extent that the attention paid to social signals increases, since this hormone is directly related to attachment, parental behaviours, and social relationships, in addition to the benefits as an antidepressant element in mental health in the confinement of the pandemic COVID-19 or in some adults who have suffered from an organic disease (10).

Despite the above, the few backgrounds information available on the subject show contradictory results regarding the benefits provided by the company of animals during the mandatory quarantine of the COVID-19 pandemic.

On the one hand, some studies present benefits derived from the company of pets during the quarantine where it is recognized that they were of significant help in terms of different psychological problems, the feeling of loneliness and feelings of anguish, helping to release tension, change the environment and slightly alter the routine imposed by the virus, thus fostering the desire to improve and preserve life in people with physiological afflictions (11). For older adults,

they represented significant support, allowing them to mitigate the feeling of abandonment and possible symptoms of depression resulting from confinement, as well as allowing them to maintain a more active lifestyle (12).

The authors highlight that during the time of social distancing within the framework of the COVID-19 pandemic, contact with animals, both companion and not, has helped owners maintain a routine, purpose, and meaning in uncertain situations, being a source of emotional support (13). Within this order of ideas, during the time of the quarantine, a significant increase in the adoption of animals, preferably dogs, and cats, could be seen, helping their custodians to reduce states of anxiety and stress observed in confinement (14).

However, aspects of concern were also evidenced, such as, for example, an alleged assumption about the contagion and transmission of the virus by animals, increased maintenance costs for pets, difficulties in health care for pets, mourning for the death of pets during quarantine, concerns for the welfare of the animal in the context of situations of increased work of their owners during the pandemic, among other aspects that increased the stress of the owners (15).

Likewise, some studies indicate an increase in behavioural problems in domestic animals, such as increased irritability, nervousness, and demand for attention, which produced a negative effect on the owners, worsening, in turn, the animal's behaviour (16).

During the quarantine period in Spain there was an almost three-fold increase in consultations in pediatric emergencies due to dog bites, which could be related to the fact that, in the confinement situation, the animals of the company were more exposed to contact with children in the family, which could lead to increased risk of bites, scratches or other injuries (17).

In this regard, differences between dogs and cats have been observed as the most frequent companion pets in homes. It seems that the dogs had a higher level of problems than the cats during the quarantine period, which was also associated with the behaviour of their guardians and with a greater number of inactive family members. The study by Bowen et al. (16) highlights that.

As can be seen, previous studies indicate the presence of contradiction from the point of view of possible benefits that can be derived from the company of pets during the quarantine, which raises the need to delve into the subject, considering, in addition, that in the Colombian context, we find ourselves with a little approach to this particular situation that also took place within homes and that, in many cases, could be decisive when facing said mandatory confinement during 2020. In this regard, the statistics from national surveys indicate that in Colombia 6 out of 10 families have a pet, with cities like Bogotá, Medellín, and Cali having the highest percentage; where, likewise, greater pet ownership is observed in the female gender,

As our climate continues to change, more disasters, including pandemics, are likely, highlighting the importance of research into the benefits that can be derived from animal companionship in these potentially critical mental health situations of human beings.

The present study was oriented to investigate the perception of a group of people from the city of Medellín about the benefits of companion animals during the mandatory quarantine time, directing attention to aspects such as the frequency of human-animal interaction, the emotional closeness with the pet, the physical and psychological benefit from the relationship with the pet, and the cost/benefit of keeping the pet during the pandemic. The previous aspects were contrasted according to sociodemographic variables of gender, age, type of pet, occupation, income level, and educational level.

METHODOLOGY

Research with a quantitative approach, descriptive level, cross-section, and non-experimental method, ex post facto.

Participants

The study involved 141 people from Medellín, Colombia. The sample was selected intentionally, making a call on social networks, and inviting people over 18 years of age who during the

mandatory isolation period due to COVID-19 in 2020 had the company of a pet. The entire sample was made up of 73 % women (n=102) and 27 % men (n=39). The average age was $M=35.2$ ($SD=8.4$), with a higher percentage of age in the range between 26-35 years (41.8 %). 24 % were students, 68 % were professionals, and 8 % were housewives. Regarding the educational level, 57 % were university students, 28 % technical and/or technologists, and 15 % with the secondary level. In the income level, the participants were located 63 % in the range of 1 to 2 minimum wages, 27 % from 2 to 4 minimum wages, and 10 % in the range greater than 4 minimum wages. 36 % of the participants had a cat as a pet, 46 % a dog, and 18 % both.

Instruments

For the collection of information in the present study, an ad-hoc Likert-type questionnaire was designed, consisting of 24 questions, with a response option between 1 (never), 2 (almost never), 3 (sometimes), and 4 (almost always), 5 (always). The scale was composed of the following subscales that evaluated: human-animal interaction during quarantine; emotional closeness with the pet during quarantine; physical benefits; psychological benefits and perceived cost.

Initially, the scale was applied to 5 people to verify their comprehension of the questions. As a second step, the scale was subjected to expert judgment, and Cohen's Kappa concordance index was calculated for the measures of sufficiency, coherence, relevance, and clarity of item writing, whose value ranged between 0.870 and 0.930 (p-value between 0.0001 and 0.019), indicating a high degree of agreement between the judges. Finally, it was applied in a pilot test to 45 people and the internal consistency coefficient of Alpha Cronbach was calculated, which presented a value of 0.796, indicating a good internal consistency of the scale. The calculation of the item-scale correlation showed an adequate correlation of all the items with the entire scale.

Likewise, a sociodemographic survey was used for the variables of gender, age, occupation, level of education, income level, and type of pet.

Procedure

To collect the information, the call was made on social networks, inviting the inhabitants of the municipality of Envigado, Colombia, who had the accompaniment of a pet during the pandemic, to participate in the study, those who responded to the call, were he sent them the questionnaire online. The study was carried out considering the procedural and ethical guidelines corresponding to Resolution 8430 of the Colombian Ministry of Health, which regulates research with human beings, and the Psychologist’s Code of Ethics (MPS, 2009). The informed consent was signed by all the participants. The study was supported by the Ethics Committee of the Envigado University Institution, within the framework of which it was carried out.

Data analysis

Since the study variables had a non-normal distribution, the Mann-Whitney U statistic was used for the inter-group comparative analysis according to sociodemographic variables in the case of two groups and Kruskal-Wallis for more than two groups. Spearman correlation was used to establish the correlation between variables. Statistical significance was established with a $p < 0.05$ value. The data were processed with the statistical package SPSS version 25 for Windows.

RESULTS

The descriptive data of the study variables allow us to observe that the score in the perception

of emotional closeness with the pet during the quarantine was at a high level (M 4.4 (SD 0.7), as well as the perception of the benefits to psychological level from the relationship with the pet during the quarantine (M 4 (SD 0.8) (Table 1).

The perception of the frequency of human-animal interaction during the quarantine was located at the medium-high level (M 3.7 (SD 0.6), followed by the perception of the physical benefit from the relationship with the pet during the quarantine, which was located at the medium level (M 2.7(SD 1.3). And, finally, a low level was observed in the scores of the variable perception of the cost of pet maintenance during the pandemic (M 1.6 (SD 0.6).

The comparison of study variables according to gender did not reveal the presence of statistically significant differences in the variable scores, except for the perception variable on the cost of pet maintenance, indicating a statistically significant difference with higher scores for the female gender ($p=0.013$) (Table 2).

The comparison of study variables according to age groups did not show the presence of statistically significant differences in the scores of any variable (Table 3).

The comparison of study variables according to the type of pet showed the presence of statistically significant differences in the scores of two variables: interaction frequency ($p=0.0001$) and physical benefits ($p=0.0001$) (Table 4).

Dog owners reported a higher perception of the frequency of human-animal interaction during quarantine, followed by owners with both pets, the score for this variable being lower for cat owners.

Table 1. Perception of the study sample on the benefits of companion animals during the mandatory quarantine period

Variable	Mean (SD)
Perception of the frequency of human-animal interaction during quarantine	3.7 (.6)
Perception of emotional closeness with the pet during quarantine	4.4 (0.7)
Perception of the physical benefit from the relationship with the pet during quarantine	2.7(1.3)
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4(0.8)
Perception of the cost of pet maintenance during the pandemic	1.6 (0.6)

Own source

Table 2. Comparison of study variables according to gender groups

Variable	Female Median (IR)	Male Median (IR)	W for Mann-Whitney	P
Perception of the frequency of human-animal interaction during quarantine	3.7 (0.8)	3.7(0.9)	1 762,500	0.295
Perception of emotional closeness with the pet during quarantine	4.7(1)	4.7(1)	1 869,500	0.567
Perception of the physical benefit from the relationship with the pet during quarantine	2.5(2.5)	3(3)	1 834,500	0.468
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4.2(1.2)	4.2(1.4)	1 722,000	0.216
Perception of the cost of pet maintenance during the pandemic	1.3(0.7)	1.8(0.8)	1 456,500	0.013

Own source

Table 3. Comparison of study variables according to age groups

Variable	18-25 Median (IR)	26-35 Median (IR)	36-50 Median (IR)	Over 50 Median (IR)	Kruskal-Wallis	P
Perception of the frequency of human-animal interaction during quarantine	3.7 (0.8)	3.8(0.9)	3.7(0.7)	3.9(0.7)	1362,500	0.395
Perception of emotional closeness with the pet during quarantine	4.7(1)	4.7(1)	4.6(0.9)	4.7(0.8)	1638,500	0.467
Perception of the physical benefit from the relationship with the pet during quarantine	2.5(2.5)	2.8(0.6)	2.6(0.7)	2.5(1)	1524,500	0.368
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4.2(1.2)	4.2(1.4)	4.3(0.6)	4.1(0.5)	1722,000	0.216
Perception of the cost of pet maintenance during the pandemic	1.3(0.7)	1.4(0.8)	1.2(0.7)	1.40(.9)	1056,500	0.213

Own source

Regarding the perception of the benefit at a physical level from the relationship with the pet during the quarantine, the highest score was

reported by dog owners, followed by owners of both types of pets, obtaining the lowest score for the owners of cats.

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Table 4. Comparison of study variables according to pet type groups

Variable	Cat Median (IR)	Dog Median (IR)	Both Median (IR)	Chi- Square	P
Perception of the frequency of human-animal interaction during quarantine	3.1(0.6)	4(0.6)	3.8(0.6)	54,718	0.0001
Perception of emotional closeness with the pet during quarantine	4.6(0.7)	4.6(1)	4.5(.7)	5,763	0.156
Perception of the physical benefit from the relationship with the pet during quarantine	1(0.5)	3.5(1.6)	3(1.5)	54,892	0.0001
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4.2(1)	4.2(1.1)	3.6(2.1)	3,249	0.197
Perception of the cost of pet maintenance during the pandemic	1.3(0.8)	1.6(0.8)	1.3(0.8)	1,091	0.580

Own source

The comparison of study variables according to the type of occupation of the owner did not

show the presence of statistically significant differences in any variable (Table 5).

Table 5. Comparison of study variables according to occupation groups

Own source	Student Median (IR)	Employed Median (IR)	Housewife Median (IR)	Retired Median (IR)	Chi- Square	P
Perception of the frequency of human-animal interaction during quarantine	3.7(0.8)	3.7(0.8)	3.6(0.8)	3.1(0.4)	0.251	0.969
Perception of emotional closeness with the pet during quarantine	4.7(1)	4.7(0.9)	4.7(1.2)	3.3(0.9)	3.387	0.336
Perception of the physical benefit from the relationship with the pet during quarantine	2.7(0.9)	3(0.8)	1.7(1.2)	1(1.3)	1.489	0.685
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4.2(.9)	4.4(1.2)	3.8(0.9)	3.4(0.9)	2.250	0.522
Perception of the cost of pet maintenance during the pandemic	1.3(0.9)	1.5(0.8)	1.4(0.5)	1.2(0.9)	2.322	0.508

Own source

The comparison of study variables according to the educational level of the owners did not show

the presence of statistically significant differences in the scores of any variable (Table 6).

Table 6. Comparison of study variables according to income level groups

Variable	1-2 smlv Median (IR)	2-4 smlv Median (IR)	More than 4 smlv Median (IR)	Chi- Square	P
Perception of the frequency of human-animal interaction during quarantine	3.6(.8)	3.6(0.8)	4(0.9)	3,180	0.204
Perception of emotional closeness with the pet during quarantine	4.7(1)	4.3(1)	4.6(0.9)	2,291	0.318
Perception of the physical benefit from the relationship with the pet during quarantine	3(0.9)	3(0.9)	3(1)	0.801	0.670
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4.2(1.1)	4.2(1.2)	4.4(1.3)	0.271	0.873
Perception of the cost of pet maintenance during the pandemic	1.5(0.7)	1.6(0.9)	1.6(1)	0.003	0.999

Own source

The comparison of study variables according to the educational level of the owners did not show

the presence of statistically significant differences in the scores of any variable (Table 7).

Table 7. Comparison of study variables according to educational level groups

Variable	baccalaureate Median (IR)	technician/technologist Median (IR)	University Median (IR)	Chi- Square	P
Perception of the frequency of human-animal interaction during quarantine	3.7(0.8)	3.7(0.7)	3.7(0.8)	0.844	0.656
Perception of emotional closeness with the pet during quarantine	5(0.8)	4.7(0.8)	4.7(0.9)	2.458	0.293
Perception of the physical benefit from the relationship with the pet during quarantine	3(1.2)	2.8(0.9)	2.8(0.9)	1.317	0.518
Perception of the benefits at a psychological level from the relationship with the pet during the quarantine	4.4(1.3)	4.4(1)	4.2(1.3)	2.571	0.277
Perception of the cost of pet maintenance during the pandemic	1.3(1.1)	1.3(0.7)	1.5(0.8)	1.257	0.533

Own source

DISCUSSION

In the first place, the higher prevalence of the female gender in the study participants is striking, with women (n=102) surpassing men two and a half times (n=39). However, this fact is related to the statistical data at the national level in Colombia, which indicates a higher percentage for the female gender in terms of pet ownership (18,19).

At the general level of the study sample, the results showed a high level in the scores in the perception of emotional closeness with the pet during the quarantine and in the perception of the psychological benefits from the relationship with the pet during the quarantine, indicating a high valuation by the owners regarding the positive emotional contribution that their pets gave them during the mandatory quarantine during the COVID-19 pandemic.

This high valuation was independent of gender, age, type of occupation, income level, educational level, or type of pet they owned. The foregoing shows that, at a general level, the company of pets allowed the participants of the present study to combat their feelings of loneliness, sadness, and depression during the quarantine, to fall asleep better, to have more discipline, and to better organize their schedules, while just like getting distracted and not worrying about the issues that generated stress, among others. Participants reported that their pet has provided them with joy and positive emotions during the quarantine. Sharing the home and time during the quarantine has made it possible for owners to strengthen affective ties towards their pets, which, at the same time allowed them to improve the perception of their states of stress. In this regard, people with dog-assisted therapy in older adults with Alzheimer's-type neurocognitive disorder obtain higher levels of mental health than those who consider them as guardians (20).

The results of the present study agree with other authors who affirm that the company of pets provides high psychological benefits to their owners, reducing the symptoms of psychological disorders such as depression, and anxiety and facilitating states of mourning through the unconditional company. On the other hand, animal-assisted intervention

processes have become an important piece as complementary therapies with excellent results in the improvement of patients with neurological damage (21).

Similarly, in a study in Ecuador during mandatory confinement, indicate the presence of great benefits derived from the company of pets at the level of security and emotional stability, company, and feeling of happiness (22). They showed that the company of pets helped to mitigate the effects of stress and anxiety, improve the ability to maintain a regular schedule, have a sense of purpose and meaning, and cope with uncertainty, a product of confinement during the COVID-19 quarantine (19).

Regarding the perception of the frequency of human-animal interaction during quarantine, the participants in this study reported a medium-high score, indicating that during the mandatory quarantine, they frequently carried out different types of activities related to their pets, such as: playing with their pet, caress it, walk it, give prizes, bathe it, share rest spaces, among others.

No statistically significant difference was identified regarding the interaction of the owners with their pets for the variables of gender, age, type of occupation, income level, and education. However, the difference was observed according to the type of pet, indicating higher scores for dogs, compared to cats. This may be related to the natural behaviour of different species and the interaction characteristics that these animals establish with their owners. In this regard, the authors indicate that the way dogs and cats interact with their owners is different in that dogs are more active, interact and seek attention from humans more frequently and intensely than cats, these being more independent.

Regarding the perception of the benefit at the physical level from the relationship with the pet during the quarantine, the study participants reported average scores, indicating the positive effect that the company of their pet had by stimulating the practice of physical exercise and helping to stay more active in other activities during quarantine. These results confirm what was found in other studies indicating that the pet company was motivated to perform physical activities during the quarantine to the participants of their study in Ecuador.

As in the previous variable, the participants indicated the presence of this positive effect regardless of their gender, age, type of occupation, income, and educational level. But the type of pet was related to the perception of the benefit at the physical level, indicating higher scores for dogs than for cats. The foregoing is also due to the differences in the characteristics of the animals, related to the satisfaction of their vital needs, where dogs demand greater physical activity, the need for walks in the open air, parks, and special areas.

As well as a greater perception of loneliness (25), which may be related to their greater perception of potential benefits derived from the company of pets and a consequent lower perception of difficulties during maintenance and care, and attention to pets.

Likewise, in the case of dogs, a higher score was obtained than for cats in terms of maintenance costs, although without a statistically significant difference, a fact that may be related to a greater demand for care and expenses related to the maintenance of a pet. On the other hand, this difference in the perception of the higher cost for dogs may be related to the fact that, according to some studies, dogs raised their stress levels during the quarantine, due to the confinement (26-29), and their custodians opted for alternatives to care for them more carefully.

CONCLUSIONS

It can be concluded that the company of pets during the time of social distancing due to the mandatory quarantine by COVID-19, has provided significant psychological and physical benefits for the study participants. This positive perception was reported regardless of sociodemographic factors such as income level, educational level, age, gender, occupation, or type of pet, showing that the human-animal relationship represents a significant factor for the well-being of their owners, especially in the situation critical to his mental health, presented during the pandemic.

Regarding the limitations of this study, it is necessary to indicate, on the one hand, the

presence of a difference in the distribution of participants according to gender, with the group of women being the largest compared to men, a fact that could interfere with the validity of results found. Due to the above, it is recommended to expand this study achieving an equitable participation of both genders.

Interest conflict

The authors of this paper declare that they have no conflict of interest in a contractual or personal labor type that could cause an unintentional bias in the investigative process carried out.

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REFERENCES

1. Bao Y, Sun Y, Meng S, Shi J, Lu L. 2019-nCoV epidemic: Addressing mental health care to empower society. *Lancet*. 2020;395(10224):e37-8.
2. Prieto Molinari DE, Aguirre Bravo GL, De Pierola I, Victoria-De Bona GL, Merea Silva LA, et al. Depression and anxiety during mandatory isolation by COVID-19 in Metropolitan Lima. *Lib Rev Peru Psicol*. 2020;26(2):e425.
3. Ramírez-Ortiz J, Castro-Quintero D, Lerma-Córdoba C, Yela-Ceballos F, Escobar-Córdoba F. Mental health consequences of the COVID-19 pandemic associated with social isolation. *Colomb J Anesthesiol*. 2020;48(4).
4. Wang ZH, Yang HL, Yang YQ, Liu D, Li ZH, Zhang XR, et al. Prevalence of anxiety and depression symptoms, and knowledge demands and psychological interventions in university students during the COVID-19 epidemic: A large cross-sectional study. *J Affect Disorder*. 2020;275:188-193.
5. Bowen J, Bulbena A, Fatjó J. The value of companion dogs as a source of social support for their owners: results of a representative sample prior to the pandemic and a convenience sample obtained during the confinement by COVID-19 in Spain. *Frontiers in Psychiatry*. 2021;12:622060.
6. Gee NR, Mueller MK. A systematic review of research on pet ownership and animal interactions among older adults. *Anthrozoa*. 2019;32(2):183-207.

PERCEPTION OF THE BENEFITS OF COMPANION ANIMALS

7. Trigg J. Examining the role of pets in the physical and mental well-being of cancer survivors. *J Psychos Oncol.* 2022;40(6):834-853.
8. Zablan K, Melvin G, Hayley A. Older Adult Companion Animal-Owner Wellbeing During the COVID-19 Pandemic: A Qualitative Exploration. *Anthrozoös.* 2022;36(2):237-256.
9. Chin-Hao Chan M, Schonert-Reichl KA, Binfet JT. Human-animal interactions and the promotion of social and emotional competencies: a scoping review. *Anthrozoa.* 2022;35(5):647-692.
10. Bolstad CJ, Porter B, Brown CJ, Kennedy RE, Nadorff MR. The Relation Between Pet Ownership, Anxiety, and Depressive Symptoms in Late Life: Propensity Score Matched Analyses. *Anthrozoos.* 2021;34(5):671-684.
11. Beltran FS. Does having pets help you cope with the isolation caused by the coronavirus? The conversation. 2020. Available in: <http://theconversation.com/tenermascotas-ayuda-a-sobrellevar-el-aislamiento-por-el-coronavirus-129809>
12. Applebaum JW, Ellison C, Struckmeyer L, Zsembik BA, McDonald SE. The impact of pets on the daily lives of older adults during the COVID-19 pandemic. *Public Health Front.* 2021;9:652610.
13. Kogan LR, Currin-McCulloch J, Bussolari C, Packman W, Erdman P. The psychosocial influence of companion animals on positive and negative affect during the COVID-19 pandemic. *Animals (Basel).* 2021;11(7):2084.
14. Ratschen E, Shoesmith E, Shahab L, Silva K, Kale D, Toner P, et al. Human-animal relationships and interactions during the lockdown phase of COVID-19 in the UK: Investigating links to mental health and loneliness. *PLoS One.* 2020;15(9): e0239397.
15. Jalongo MR. Pet ownership in times of COVID-19: the canine and feline companions of young children. *Early Child Educ J.* 2021:1-11.
16. Bowen J, García E, Darder P, Argüelles J, Fatjó J. The effects of the Spanish confinement due to COVID-19 on people, their pets and the human-animal bond. *J Vet Behav.* 2020;40:75-91.
17. Dixon CA, Mistry RD. Dog bites in children increase during coronavirus disease-2019: a case to improve prevention. *J Pediatric.* 2020;225:231-232.
18. Álvarez-Cejudo G. Benefits of animal-assisted intervention in the classroom. *Papeles Salmantinos de Educación.* 2019;(23):167-202.
19. Guevara L. Six out of every 10 households in the country have pets according to Brandstrat. The Republic newspaper. Available from: <https://www.larepublica.co/consumo/seis-de-cada-10-hogares-del-pais-tienen-mascota-segun-brandstrat-2829114>
20. Rubio A. Sensory stimulation in people with Alzheimer's from Occupational Therapy. Systematic Review Sensory stimulation in people with Alzheimer's disease from Occupational Therapy. Systematic review. Unizar.es. Available from: <https://zaguan.unizar.es/record/106805/files/TAZ-TFM-2021-180.pdf>
21. Eizaguirre B, Alonso R, López PA, Díaz Videla M. View of Animal Assisted Interventions in Patients with Multiple Sclerosis. *Calidad de Vida y Salud.* 2020;13:175-183.
22. Patiño Rodas K. Living with companion animals in contemporary culture, benefits perceived by custodians as a result of living with companion animals, during confinement by COVID-19. Casa Grande University: Faculty of Administration and Political Science; 2020. Available from: <http://dspace.casagrande.edu.ec:8080/handle/ucasagrande/2547>
23. Arboleda M. Humans, dogs and cats. Social characterization of the possession of canines and cats in Medellín. [Grade work], University of Antioquia, Faculty of Social and Human Sciences, Department of Anthropology. 2019. Available from: https://bibliotecadigital.udea.edu.co/bitstream/10495/13602/1/ArboledaMarielena_2019_HumanosPerrosGatos.pdf
24. Calderon Puentes N, Gomez Carreno MN. Efectos psicológicos asociados a la tenencia de animales de compañía. 2021. Available from: <http://hdl.handle.net/20.500.12749/13881>.
25. Hughes MJ, Verreynne ML, Harpur P, Pachana NA. Companion animals and health in older populations: a systematic review. *Clin Gerontol.* 2020;43(4):365-77.
26. Balluerka N, Gomez J, Dolores M, Gorostiaga A, Espada J, Padilla J, et al. Consecuencias psicológicas de la COVID-19 y el confinamiento. Informe de investigación. Bilbao, Servicio de Publicaciones de la Universidad del País Vasco. 2020;210:551-534.
27. Cudris-Torres L, Barrios-Núñez A, Bonilla-Cruz NJ. Coronavirus: epidemia emocional y social. *Arch Ven Farmacol Terap.* 2020;39(3):309-312.
28. Bonilla-Cruz DN-J, Cudris-Torres L, Mendoza-Rincón B-M, Gamboa-Aldana A-S, Forgiony-Santos J. Health Strategies in Latin America for the Elderly in relation to COVID-19. *Gac Méd Caracas.* 2020;128(2S):S301-S311.
29. Cudris-Torres DL, Olivella-López G, Cuenca-Calderón SE, Barrios-Núñez Álvaro, Bonilla-Cruz NJ, Bustos-Arcón V, et al. Financial management and satisfaction with life in Colombians during confinement by COVID-19. *Gac Méd Caracas.* 2020;128(2S):S312-S319.

Internalized and externalized problems in preschoolers and emotional state of caregivers during the COVID-19 pandemic: A longitudinal study

Problemas internalizados y externalizados en preescolares y estado emocional de cuidadores durante la pandemia del COVID-19: un estudio longitudinal

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SUMMARY

Introduction: *The COVID-19 pandemic forced to take measures to protect public health such as mandatory social isolation and the closure of universities and schools, unprecedented measures such as the case of Colombia that affected the emotional state of the population and their mental health.*

Objective: *To compare internalized and externalized problems in preschoolers and the emotional state of caregivers during the COVID-19 pandemic, at three different times, before isolation (2019), during isolation (2020) and after it (2021).*

Method: *The study was quantitative, of correlational scope and longitudinal cut, the sample was comprised of 42 preschoolers and their caregivers, the applied*

instruments were the child behavior checklist (CBCL), the Beck Depression Inventory-II, the Costello and Comrey Depression and Anxiety scale.

Results: *It was observed that the anxiety symptoms in the caregivers increased after the quarantine, while the depressive symptoms were more before and during it, in the children the anxiety problems increased in the quarantine and decreased after it, on the other hand, the aggressive behavior had significant differences in the three moments.*

Conclusions: *The presence of internalized and externalized problems in early childhood has a direct influence on their development, as well as on the relationship they establish with their parents and peers, so the data reported here are useful to formulate strategies that allow reducing the development of these problems.*

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Keywords: *Externalization problems, Internalization problems, preschool, emotion, caregivers, pandemic, COVID-19.*

RESUMEN

Introducción: *La pandemia por COVID-19 obligó a tomar medidas para proteger la salud pública como el aislamiento social obligatorio y el cierre de universidades y escuelas, medidas sin precedentes como es el caso de Colombia que provocó afectaciones en el estado emocional de la población y su salud mental.*

Objetivo: *Comparar los problemas internalizados y externalizados en preescolares y el estado emocional de cuidadores durante la pandemia por COVID-19, en tres momentos distintos, antes del aislamiento (2019), durante el aislamiento (2020) y después de este (2021).*

Método: *El estudio fue cuantitativo, de alcance correlacional y corte longitudinal, la muestra estuvo comprendida por 42 preescolares y sus cuidadoras, los instrumentos aplicados fueron la lista de verificación de comportamiento infantil (CBCL), el Inventario de Depresión de Beck-II, la escala de depresión y ansiedad de Costello y Comrey.*

Resultados: *Se observó que los síntomas ansiosos en las cuidadoras aumentaron después de la cuarentena, mientras que los síntomas depresivos fueron mayores antes y durante esta, en los niños los problemas de ansiedad aumentaron en cuarentena y disminuyeron después de esta; por su parte, el comportamiento agresivo tuvo diferencias significativas en los tres momentos.*

Conclusiones: *La presencia de problemas internalizados y externalizados en la primera infancia tiene influencia directa en su desarrollo, así como en la relación que establecen con sus padres e iguales, por lo que los datos aquí reportados son de utilidad para formular estrategias que permitan disminuir el desarrollo de dichos problemas.*

Palabras clave: *Problemas internalizados, problemas externalizados, preescolares, estado emocional, cuidadoras, pandemia, COVID-19.*

INTRODUCTION

In March 2020, the World Health Organization (WHO) declared the coronavirus COVID-19 pandemic, forcing governments around the world to take measures to protect citizens, declaring a quarantine and the closure of universities, schools, among other establishments. COVID-19 triggered a

series of alterations in the daily routine due to social isolation and mobility limitations, due to this situation it is expected that there will be a negative impact on childhood development, on the emotional state of children and parents, on their physical and mental health and learning (1-4).

The closure of schools for a long period of time has caused an increase in parental stress, added to the loss of employment, economic difficulties, work at home, the multiple tasks that require parental attention such as upbringing, housework, health anxiety, loss of relatives or people who support the upbringing, all this together causes greater discomfort in parents and therefore more emotional and behavioral problems in children, as well as difficulties in the interaction of parents and children (5-7). Researchers consider that the emotional state of children, as well as the symptoms of anxiety and stress, are altered because interactions with parents or caregivers are dysfunctional, are not of quality, and contact is less. The affectations in the emotional state can also be due to the lack of socialization or approach with their schoolmates, teachers, and neighbors (4). Melero et al. (8) found that parents who used expression suppression as a strategy to regulate emotions had children with greater childhood symptomatology, that is, more anxiety, sleep problems, cognitive and behavioral alterations, and eating problems.

According to the family observatory (9) in Colombia, the COVID-19 emergency showed an unequal impact according to gender, since at the economic level the cost for women was higher because the unemployment rate is higher, they had to exhaust the permits, vacations, reduce their working hours, income and quality of life and even leave work because they do not have someone to help care for their children. All these events affect the health of women due to psychological stress, lack of motivation and apathy, especially in single-parent homes where the head of the household is a woman. The family observatory (9) indicates that the distancing of children and adolescents from school, as well as the stress that parents are going through (4), generates other problems such as intra-family abuse, pregnancy at an early age, sexual exploitation, child labor, forced recruitment of groups outside the law as occurs in Colombia, overcrowding and abuse of new technologies (3). Due to the above, Quero et al. (1) affirms that firm and calm parents or caregivers make it easier for children to better resist preventive isolation and their response to the threat of risk,

likewise, they better cope with adversity and there are fewer psychological repercussions when children are not separated from the main caregiver by contagion or death, but their characteristics influence their coping response.

Researchers such as Erades and Morales (10), point out that children who experience quarantine as a traumatic event are more likely to present stress and related pathologies such as post-traumatic stress disorder, likewise, they exposed that those parents who made use of biosecurity measures appropriate during isolation, favored the manifestation of less negative reactions in children. However, there are various authors such as Sánchez (11) who argues that there are few studies on the impact of COVID-19 on the general population, and there are even fewer studies that find out how the emotional management of families and the satisfaction that parents have with parenting during quarantine has influenced the mental health of children (8).

Boys and girls are vulnerable in this pandemic situation since protective measures do not make visible the impact of the consequences on the population (12), which is why during this period studies show the loss of healthy habits, problems in eating, fear anxiety, depression, sleeping problems, hyperactivity, irritability, the combination of depression and anxiety, post-traumatic symptoms (3,11,13,14). In preschool children, the reality is similar, since symptoms of anxiety related to somatic processes are expected to appear, such as diarrhea, hyperventilation, palpitation, feelings of sadness and abandonment, regressive behaviors, and more serious responses to this event are obsessions and compulsions, alterations in food, sleep, communication problems, demand more affection, difficulty taking care of themselves (11,14-15). The population of children living in unfavorable conditions cannot be forgotten, since the impact on them is more negative on a physical and mental level, due to an increase in inequity conditions. For example, the closure of educational centers increases unhealthy menus at home, inequality in learning results, where the virtual educational environment requires resources that low-income families find difficult to achieve (16).

The virtual modality in early childhood children also had negative effects on the development of their emotions, since according to Gómez and Castrillón (17), during the virtual pedagogical processes, preschoolers presented emotions such as anger (14 %), sadness (18 %), frustration (33 %),

likewise, their study showed that only 43 % of the early childhood children with whom they worked had regular progress, in addition, that 10 % of the parents had the resources and the environment of learning and adequate time to accompany the minor during the pedagogical orientation (9).

Technological tools have been very helpful during the pandemic, but it has had negative effects on boys and girls due to the time they spend in front of screens, where their health is affected by increased sedentary lifestyles (3-4), however, not having easy access to this type of device increases the social gap and violates the child, since the educational gap increases and the rates of learning are not maintained mainly in poor countries or fragile economies such as Colombia (18).

The effects of COVID-19 are unknown in the long term because it is not known how quarantine can affect boys and girls, the researchers suggest that it is necessary to identify the variables that affect the well-being of preschoolers since there will continue to be new strains of COVID-19 or other viruses that will be unknown (13). Likewise, it is necessary to carry out long-term studies with larger sample sizes to assess the real effects that quarantine caused on the emotional stability of childhood (1). It is recognized that the pediatric population is vulnerable, but it is characterized by having a great capacity for adaptation, adjustment, assimilation, and creativity, among others, which helps them to adjust to adverse situations more quickly. For this reason, it is imperative to assess the state of the population in the face of the COVID-19 pandemic, which turned out to be a sudden and complex event (11).

This research aims to compare the internalized and externalized problems of preschoolers and the emotional state of their caregivers during the COVID-19 pandemic, at three different moments, before isolation (2019), and during isolation (2020) and after it (2021).

METHOD

This research is of a quantitative design, a correlational type, and of a positivist paradigm. The scope of this type of study allows establishing associations between two concepts or variables, although it is customary to make associations between more variables, therefore each of the variables that the researcher supposes are related is measured, to

later quantify and analyze the existence of association. Given this particularity, it will be possible to compare the existence of variability in the internalized and externalized problems of preschoolers and the emotional state of caregivers during the COVID-19 pandemic, at three different moments before (2019), during (2020) and after (2021) preventive isolation, hence the research cut is longitudinal.

42 caregivers of preschool or early childhood boys and girls participated, from several CDC (Child Development Centers), in the city of Sincelejo. Three instruments were applied to these caregivers: 1. Child Behavior Checklist (CBCL) for children between one year and medium to five from Achenbach & Rescorla (19), which measures emotional reactivity, anxiety/depression, somatic symptoms, withdrawal, and sleep problems, is made up of 100 items and has a response scale with three possible choices that are 0=Not true, 1=somewhat sometimes, 2=very true or often true. 2. Beck Depression Inventory-II (BDI-II) (20), which is a self-administration questionnaire made up of twenty-one items, which reports the presence of depression in the subject and its degree of severity, which it is done by indicating symptoms such as sadness, crying, loss of pleasure, feelings of failure and guilt, suicidal thoughts or desires,

and pessimism, among others. 3. Costello Comrey Depression and Anxiety Scales (21), which measures two factors, anxiety, and depression, reporting their severity at high and low levels. This inventory is self-administered and is made up of 10 items.

The data analysis was done with the statistical software Statistical Package for Social Science (SPSS) V. 20 to calculate the means of the total scores obtained three times before (2019), during (2020) and after (2020) the quarantine COVID-19, the Student T-test was calculated for the comparison of the scores obtained in the three moments, the means were compared between Time 1 (T1) and Time (2), between T2 and Time 3 (T3), between T1 and T3.

RESULTS

Presence of Anxiety and Depression Symptoms in Caregivers

In quarantine, caregivers' anxiety symptoms at T3 increased significantly compared to T1 ($p = 0.005$). Regarding depressive symptoms, these increased significantly from T1 to T2 ($p=0.004$), from T2 to T3 ($P=0.0001$), and from T1 to T3 ($p=0.0001$) (Table 1).

Table 1. Symptoms of anxiety and depression in caregivers before, during, and after quarantine

Symptoms	T1	T2	T3
	Mean (standard deviation) N=42	Mean (standard deviation) N=42	Mean(standarddeviation) N=42
Anxiety symptoms in caregivers	2.76 (1.97)	3.61 (1.87)	3.16 (2.24)
Depression symptoms in caregivers	4.38 (3.94)	7.11 (5.50)	14.97 (2.19)

Presence of Internalized Problems in Children

Anxiety problems increased during the quarantine and decreased significantly after it ($p=0.0001$). In contrast, depressive symptoms increased from T1 to T2 ($p=0.001$), from T2 to T3 ($p=0.0001$), and from T1 to T3 ($p=0.0001$). Sleeping problems decreased significantly from T2 to T3 ($p=0.001$) and from T1

to T3 ($p=0.0001$), while somatic symptoms did not present significant mean differences in any of the comparisons between times. On the other hand, the symptoms related to being emotionally reactive increased from T1 to T2 ($p=0.024$) and decreased from T2 to T3 ($p=.000$), there was also a significant difference between T1 and T3 ($p=0.0001$) (Table 2).

Table 2. Internalized symptoms before, during and after quarantine

Internalized symptoms	T1	T2	T3
	Mean (standard deviation)	Mean (standard deviation)	Mean (standard deviation)
Anxiety problems	3.21 (2.50)	5.28 (3.21)	1.16 (1.42)
Depression problems	1.26 (1.49)	2.02 (1.53)	5.54 (3.90)
Sleeping problems	2.26 (2.29)	2.47 (2.24)	0.78 (1.81)
Withdrawal	0.73 (1.44)	1.66 (1.73)	1.38 (2.15)
Somatic symptoms	1.50 (1.90)	1.61 (1.66)	2.26 (1.84)
Anxiety/depression symptoms	2.14 (1.84)	3.47 (2.68)	1.47 (1.64)
Emotionally reactive	1.33 (1.54)	2.19 (2.16)	0.09 (0.37)

Presence of Externalized Symptoms in Children

Regarding aggressive behavior, significant differences were found in the three moments ($p=0.0001$). An increase in attention problems was

also found from T1 to T2 ($p=0.001$) and a decrease from T2 to T3 ($p=0.0001$). Regarding autism symptoms, they increased significantly from T1 to T2 ($p=0.001$) and from T1 to T3 ($p=0.002$) (Table 3).

Table 3. Externalized symptoms before, during and after quarantine

Externalized symptoms	T1	T2	T3
	Mean (standard deviation)	Mean (standard deviation)	Mean (standard deviation)
Oppositional and defiant behavior	3.12 (2.05)	4.19 (3.21)	2.95 (1.93)
Aggressive behavior	5.75 (3.85)	9.61 (6.36)	2.52 (1.53)
Autism symptoms	1.51 (2.14)	2.88 (2.17)	3.38 (2.76)
Neglect problems	2.40 (1.38)	3.61 (1.88)	2.00 (2.26)

DISCUSSION

Symptoms of Anxiety and Depression in Adults, One Year After Quarantine

The mental health of preschool-age children and caregivers has been significantly affected by the COVID-19 pandemic (22,23). International and national findings report that preschool caregivers in the quarantines imposed by COVID-19 experienced depressive symptoms (22,24,25), anxious symptoms (24,26), somatic symptoms (22), and stress (25,27,28). In accordance with

the background, the results of this investigation indicate that the caregivers presented an increase in depressive and anxious symptoms in relation to the period before the pandemic, also, it was found that depressive symptoms increased after the quarantine period. An expected result, considering that a negative psychological impact was already expected during and immediately after the quarantine periods in the general population (13). The fact that symptoms have risen after the quarantine period has important repercussions not only on the mental health of caregivers but also impacts the mental health of preschoolers, as previous research has shown that mental health problems of caregivers make a significant contribution to the

transmission of psychopathological difficulties to their children (29-31).

Internalized Problems in Early Childhood Children in the COVID-19 Pandemic

Larraguibel et al. (32) when analyzing the internalized problems in preschool and school children before and during the pandemic, found an increase in depressive symptoms during the pandemic period compared to the symptoms before it, likewise, sleep problems increased. For their part, Viola and Nunes (33) agree that there is an increase in internalized symptoms during the pandemic, especially depressive symptoms, although a greater presence of anxiety symptoms has also been identified. Loades et al. (34) point out that social isolation measures led to an increase in anxiety symptoms and depressive symptoms in children and adolescents, in addition, they state that these symptoms could be maintained between 0.25 and 9 years later. In this study, depressive symptoms increased during the quarantine and were maintained after it, in contrast, anxiety symptoms also increased during the quarantine but decreased after it. These findings partially differ from the findings of Rakickienè et al. (35), who found no increase in emotional problems in a group of preschoolers. Despite these differences, the results presented here have important implications for the development of mental health care measures immediately and in the years following the pandemic.

Regarding somatic symptoms, previous research highlights the increase in these symptoms in preschoolers during the confinement period (36-38), in agreement, in the present investigation, somatic complaints increased during the quarantine period and continued to increase after it. A data of notable interest considering that somatic symptoms could be maintained in school age and adolescence, in addition, they have been associated with maladaptation characterized by difficult temperaments, and emotional and behavioral problems (39).

Externalized Problems in Early Childhood Children by the Pandemic

The international literature has reported the appearance or increase of externalized symptoms as a direct consequence of the COVID-19

pandemic. Kılıçaslan et al. (40), studied the clinical manifestations of autism in a sample of preschoolers and highlighted the increase in autism symptoms during the pandemic period. A similar result was found in this study, there was an increase in autism symptoms in the quarantine, but in addition, these continued to rise after the quarantine. Although there are few longitudinal investigations dedicated to studying this variable, regarding these manifestations, Charney et al. (41) explain that distancing measures imply low possibilities for meaningful interactions with peers, the use of masks can obscure the social cues provided through facial expressions, and ultimately, as a result, opportunities to develop social skills in children are diminished compared to pre-pandemic living conditions. In addition, as some researchers point out, skills and behavior problems during early childhood are associated with later educational achievements (42), for this reason, it would be worth carrying out intervention processes that manage to reduce the effects that education could have the presence of these symptoms in this period of life.

It also stands out from these findings that oppositional behavior, aggressive behavior, and attention problems increased in quarantine and decreased after it. A similar result was found by Ciantiani et al. (43) when studying internalizing and externalizing symptoms in children, preschoolers had an increase in aggressive behavior and oppositional behaviors during the period of confinement. In contrast, Wenter et al. (44), reported that the number of preschoolers with clinical manifestations of aggressive behavior was significantly low during the pandemic period.

Clinical Implications of the Present Work

The presence of internalized and externalized problems in early childhood has a direct influence on the development of boys and girls, as well as on the relationship they establish with their parents and peers, so the data reported here are useful to formulate strategies that help reduce the development of these problems. Regarding the mental health of caregivers, the psychopathological symptoms of parents may interfere with their perceptions of their children's behavior and adaptation, and in some cases lead to the underestimation of the children's symptoms and/or an inadequate parent-child interaction pattern (45).

Limitations

The reporting of externalizing and internalizing symptoms in children was based solely on parental reporting, so the data could be biased by their emotional state. In addition, the symptomatic evolution in the three periods in which the measurements were made could be part of the development of the child. Despite its limitations, this study provides valuable information on the psychological response of preschool children and their caregivers in Colombia during the COVID-19 pandemic.

CONCLUSIONS

The objective of this research was to compare the internalized and externalized problems in preschoolers, and the emotional state of caregivers, at three different moments, before the quarantine due to COVID-19 (2019), during the quarantine (2020), and after it (2021). A decrease in symptoms was found in most externalized and internalized problems. However, in the case of depression (both in adults and children), the symptoms increased after the quarantine. In addition, somatic symptoms and autism symptoms increased.

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Conflict of interest

The authors declare that there is no conflict of interest.

Authors' contributions

The first author: Conceived the research, helped in the writing of the article, and applied instruments.

The second author: Conceived the research, searched for bibliographic information, and applied instruments.

Third author: Assisted in writing the article.

The fourth author: Conceived the research and helped in writing the paper.

Fifth author: Conceived the research, analyzed the data, and helped in writing the article.

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REFERENCES

1. Quero L, Moreno Montero-Galvache MÁ, de León Molinari P, Espino Aguilar R, Coronel Rodríguez C. Estudio del impacto emocional de la pandemia por COVID-19 en niños de 7 a 15 años de Sevilla. *Rev Psiquiatr Infanto-Juv.* 2021;38(1):20-30.
2. Etchebehere G, De León R, Silva F, Fernández D, Quintana S. Percepciones y emociones ante la pandemia: recogiendo las voces de niños y niñas de una institución de educación inicial pública del Uruguay. *Psicol Conoc Soc.* 2021;11(1):8-35.
3. Paricio del Castillo R, Pando Velasco MF. Salud mental infanto-juvenil y pandemia de COVID-19 en España: cuestiones y retos. *Rev Psiquiatr Infanto-Juv.* 2020;37(2):30-44.
4. Hincapié D, López-Boo F, Rubio-Codina M. El alto costo del COVID-19 para los niños: Estrategias para mitigar su impacto en América Latina y el Caribe. *Inter-Am Develop Bank.* 2020:1-16.
5. Betancourt-Ocampo D, Riva-Altamirano R, Chedraui-Budib P. Estrés parental y problemas emocionales y conductuales en niños durante la pandemia por COVID-19. *Enseñanza Invest Psicol.* 2021;3(2):227-238.
6. Malhi GS, Bell E, Bassett D, Boyce P, Bryant R, Hazell P, et al. The 2020 Royal Australian and New Zealand College of Psychiatrists clinical practice guidelines for mood disorders. *Aust NZ J Psychiatry.* 2021;55(1):7-117.
7. Hiraoka D, Tomoda A. Relationship between parenting stress and school closures due to the COVID-19 pandemic. *Psychiatry Clin Neurosci.* 2020;74(9):497-498.
8. Melero S, Morales A, Espada JP, Orgilés M. Gestión emocional parental y sintomatología infantil durante

INTERNALIZED AND EXTERNALIZED PROBLEMS IN PRESCHOOLERS

- la pandemia del covid-19. *Int J Dev Educ Psychol Rev INFAD Psicol.* 2021;2(1):283-292.
9. Observatorio de familias. *La Familia y los Efectos del COVID-19.* Disponible en: <https://observatoriodefamilia.dnp.gov.co/Documents/Boletines/Boletin%2015.pdf>
 10. Erades N, Morales A. Impacto psicológico del confinamiento por la COVID-19 en niños españoles: un estudio transversal. *Revista de Psicología Clínica Con Niños y Adolescentes.* 2020;7(3):27-34.
 11. Sánchez Boris IM. Impacto psicológico de la COVID-19 en niños y adolescentes. *MEDISAN.* 2021;25(1):123-141.
 12. Etchebehere G, León Siri R, Silva Fernández D, Quintana S. Percepciones y emociones ante la pandemia: recogiendo las voces de niños y niñas de una institución de educación inicial pública del Uruguay. *Psicol Conoc Soc.* 2021;11(1):5-23.
 13. Nobles J, Martin F, Dawson S, Moran P, Savovic J. The Potential Impact of COVID-19 on Mental Health Outcomes and the Implications for Service Solutions. National Institute for Health Research: University of Bristol; 2020. Available from: <https://www.arc-wnihracuk/research-and-implementation/covid-19-response/reports/potential-impact-of-covid-19-on-mental-health-outcomes-and-the-implications-for-service-solutions>
 14. Guerrero G. Midiendo el impacto de la COVID-19 en los niños y niñas menores de seis años en América Latina – Mapeo de encuestas en curso y sistematización de lecciones aprendidas. *The Dialogue.* Available from : <https://www.thedialogue.org/analysis/midiendo-el-impacto-de-la-covid-19-en-los-ninos-y-ninas-menores-de-seis-anos-en-america-latina-mapeo-de-encuestas-en-curso-y-sistematizacion-de-lecciones-aprendidas/?lang=es>
 15. UNICEF. *Primera infancia: impacto emocional en la pandemia.* Programa interagencial Primera Infancia y Sistema Integral de Cuidados; 2021. Available from <https://www.unicef.org/argentina/media/10606/file/Primera%20infancia.%20Impacto%20emocional%20en%20la%20pandemia%20.pdf>.
 16. Cifuentes F. Consecuencias del cierre de escuelas por el COVID-19 en las desigualdades educativas. *Rev Intern Educ Just Soc.* 2020;9(3):1-12.
 17. Castrillón Fonseca M, Gómez Figueredo DP. Efectos del confinamiento y la educación mediada por las TIC en el desarrollo emocional de la primera infancia (niños Grado Primero) en tiempos de pandemia de la I.E.D Villa Amalia-Bogotá. [tesis pregrado] 2021. Bogotá: Universidad Libre; 2021. Recuperado a partir de <https://repository.unilibre.edu.co/handle/10901/20313>.
 18. Buitrago RE, Molina GE. Profesorado, emociones y escuela. Reflexiones en tiempo de pandemia COVID-19. *Rev Habitus.* 2021;1(1):e12551.
 19. Achenbach T, Rescorla L. *Manual for the ASEBA Preschool-Age Forms & Profiles.* Disponible en: <https://aseba.org/basic-references/>
 20. Beck A, Steer R, Brown G. *Inventario de Depresión de Beck-II BDI-II.* Buenos Aires Argentina; 2009.
 21. Costello CG, Comrey AL. Scales for measuring depression and anxiety. *J Psychology.* 1967;66(2):303-313.
 22. Cimino S, Di Vito P, Cerniglia L. The impact of COVID-19 pandemic on psychopathological symptoms in mothers and their school-age children before, during and after the COVID-19 pandemic peak. *Curr Psychol.* 2022:1-10.
 23. Du P, Li D, Wang A, Shen S, Ma Z, Li X. A Systematic Review and Meta-Analysis of Risk Factors Associated with Severity and Death in COVID-19 Patients. *Can J Infect Dis Med Microbiol.* 2021;2021:6660930.
 24. Adegboye D, Williams F, Collishaw S, Shelton K, Langley K, Hobson C, et al. Understanding why the COVID-19 pandemic-related lockdown increases mental health difficulties in vulnerable young children. *JCPP Adv.* 2021;1(1): e12005
 25. Joo SW, Kim H, Jo YT, Ahn S, Choi YJ, Choi W, Lee J. Impact of the early phase of the COVID-19 pandemic on the use of mental health services in South Korea: A nationwide, health insurance data-based study. *Soc Psychiatry Psychiatr Epidemiol.* 2022:1-12.
 26. Romero-Acosta K, Fonseca-Beltrán L, Doria-Dávila D, Herazo-Chamorro M, Pérez-Vásquez D. Estado emocional de cuidadores y de niños preescolares: antes y durante la cuarentena por COVID-19. *Duazary.* 2022;19(2):85-94.
 27. Chin M, Sung M, Son S, Yoo J, Lee J, Chang YE. Changes in Family Life and Relationships during the COVID-19 Pandemic and their Associations with Perceived Stress. *Family and Environment Research.* The Korean Home Economics Association. 2020;58:447-461.
 28. Moya A, Serneels P, Desrosiers A, Reyes V, Torres MJ, Lieberman A. The COVID-19 pandemic and maternal mental health in a fragile and conflict-affected setting in Tumaco, Colombia: A cohort study. *Lancet Glob Health.* 2021;9(8):1068–76.
 29. Cimino S, Marzilli E, Tambelli R. Psychological distress due to COVID-19 in parents and children's emotional and conduct problems: the mediation role of couple adjustment and parenting stress. *PSY-HUB.* 2021;38(2):15-22.

30. Glynn LM, Davis EP, Luby JL, Baram TZ, Sandman CA. A predictable home environment may protect child mental health during the COVID-19 pandemic. *Neurobiol Stress*. 2021;14:100291.
31. Monk C, Lugo-Candelas C, Trumpff C. Prenatal Developmental Origins of Future Psychopathology: Mechanisms and Pathways. *Ann Rev Clin Psychol*. 2019;15:317-344.
32. Larraguibel M, Rojas Andrade R, Halpern M, Montt ME. Impacto de la pandemia por COVID -19 en la salud mental de preescolares y escolares en Chile. *Rev Chil Psiquiat Infanc Adolesc*. 2021:12-21.
33. Viola TW, Nunes ML. Social and environmental effects of the COVID-19 pandemic on children. *J Pediatría*. 2022;98(1):4-12.
34. Loades ME, Chatburn E, Higson-Sweeney N, Reynolds S, Shafran R, Brigden A, et al. Rapid Systematic Review: The Impact of Social Isolation and Loneliness on the Mental Health of Children and Adolescents in the Context of COVID-19. *J Am Acad Child Adolesc Psych*. 2020;59(11):1218-1239.
35. Rakickienė L, Jusienė R, Baukienė E, Breidokienė R. Pre-schoolers' behavioural and emotional problems during the first quarantine due to COVID-19 pandemic: The role of parental distress and screen time. *PSY*. 2021;64:61-68.
36. Garcia-Adasme SI, Cárdenas-Rebollo JM, Jimenez-Perianes A, Lalinde M, Jimeno S, Ventura PS, et al. Pediatric home confinement due to COVID-19: Somatic and anxiety spectrum consequences. *J Clin Nurs*. 2021;30(21-22):3238-3248.
37. Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet*. 2020;395(10227):912-920.
38. Conti E, Sgandurra G, De Nicola G, Biagioni T, Boldrini S, Bonaventura E, et al. Behavioural and Emotional Changes during COVID-19 Lockdown in an Italian Paediatric Population with Neurologic and Psychiatric Disorders. *Brain Sci*. 2020;10(12):918.
39. Engel ML, Winiarski DA, Reidy BL, Brennan PA. Early-Life Somatic Complaints: Longitudinal Associations with Maternal and Child Psychopathology. *J Dev Behav Pediatr*. 2018;39(7):573-579.
40. Kılıçaslan F, Bakirci B, Ayaydin H, Özlem Kütük M. The effects of the COVID-19 pandemic on pre-school age children: A retrospective study. *Neuropsychiatr Invest*. 2022;60(2):32-37.
41. Charney SA, Camarata SM, Chern A. Potential impact of the COVID-19 pandemic on communication and language skills in children. *Otolaryngol Head Neck Surg*. 2021;165(1):1-2.
42. Ansari A. The persistence of preschool effects from early childhood through adolescence. *J Educ Psychol*. 2018;110(7):952-973.
43. Cantiani C, Dondena C, Capelli E, Riboldi EM, Molteni M, Riva V. Effects of COVID-19 Lockdown on the Emotional and Behavioral Profiles of Preschool Italian Children with and without Familial Risk for Neurodevelopmental Disorders. *Brain Sci*. 2021;11(4):477.
44. Wenter A, Schick M, Sevecke K, Juen B, Exenberger S. Children's Mental Health During the First Two Years of the COVID-19 Pandemic: Burden, Risk Factors and Posttraumatic Growth - A Mixed-Methods Parents' Perspective. *Front Psychol*. 2022;13:901205.
45. Taraban L, Shaw DS. Parenting in context: Revisiting Belsky's classic process of parenting model in early childhood. *Develop Rev*. 2018;48:55-81.

Perceived self-efficacy and its relationship with the perception of the characteristics of remote work in a pandemic situation in a sample of colombian primary, secondary and university basic education teachers

Autoeficacia percibida y su relación con la percepción de las características del trabajo remoto en situación de pandemia en una muestra de docentes colombianos de educación básica primaria, secundaria y universitaria

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SUMMARY

The article presents the results of the study aimed at identifying self-perceived efficacy and its relationship with the perception of the characteristics of remote work in conditions of the COVID-19 pandemic in a sample of Colombian teachers. In the quantitative study, with a descriptive-correlational level, 385 teachers from seven different departments participated, with an average age of $M=34.5(SD=2.8)$, who worked at the educational levels from elementary school to teaching programs postgraduate. For the collection of the information were used the General Self-efficacy Scale

(Baessler and Schwarzer, 1996) and the Quarantine Virtual Teacher Work Questionnaire, which was designed ad-hoc for the present study and measured the four factors: work at home and organization; the methodology; family, social and work environment and personal satisfaction. The results showed the presence of a medium level of self-perceived efficacy, probably associated with abrupt changes in the virtual teaching modality. In the study sample, there were found difficulties related to the reconciliation between virtual work and different aspects of the family environment, and a medium level in the management of methodological and technological tools and job satisfaction. Being discussed the implications of the virtual teaching experience during the pandemic and its

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importance for teachers' preparation in technological tools and innovative methodologies to implement virtual and mixed education.

Keywords: *Self-perceived efficacy, virtual teaching, teacher, COVID-19 pandemic.*

RESUMEN

Se presentan resultados del estudio orientado a identificar la eficacia autopercebida y su relación con la percepción de las características del trabajo remoto en condiciones de la pandemia de COVID-19 en una muestra de docentes colombianos. En el estudio cuantitativo, con nivel descriptivo-correlacional, participaron 385 docentes de siete diferentes departamentos, con edad promedio de $M=34,5$ ($Dt=2,8$), que se desempeñaban en los niveles educativos desde la primaria hasta los programas de posgrado. Para la recolección de información se utilizó la Escala de Autoeficacia General (Baessler y Schwarzer, 1996) y el Cuestionario de trabajo docente virtual en cuarentena, diseñado ad-hoc para el presente estudio, que valoró los cuatro factores: trabajo en casa y la organización, la metodología, conciliación del entorno familiar, social y laboral y la satisfacción personal. Los resultados mostraron la presencia de un nivel medio en la eficacia autopercebida, relacionado probablemente con las dificultades asociados al cambio abrupto en la modalidad de enseñanza. Se presentaron mayores dificultades relacionados con la conciliación entre el trabajo virtual y diferentes aspectos relacionados con el entorno familiar, un nivel medio en el manejo de herramientas metodológicas y tecnológicas y en la satisfacción laboral. Se discuten las implicaciones de la situación vivida durante la pandemia desde la importancia de una mayor preparación de los docentes en las herramientas tecnológicas y metodologías innovadoras para implementar educación virtual y mixta.

Palabras clave: *Eficacia autopercebida, enseñanza virtual, docente, pandemia de COVID-19.*

INTRODUCTION

The situation of COVID-19 pandemic has had multiple repercussions on social life in all countries of the world, both at the level of physical and mental health (1-3) the consequences at the economic level (4), and changes in routines and habits of life in general. One of these aspects was related to the move to remote working mode

due to the implementation of the mandatory quarantine, where many companies had to implement immediate measures to ensure social distancing, changing people's lifestyles (5).

Some authors have highlighted the benefits of this type of work, considering its advantages for new forms of economic organization, strengthening of intellectual capital, a configuration of remote work teams at an international level, including greater autonomy for workers, reduction of stress, strengthening of family ties, reduction of expenses, among others (6). However, this type of work performance entails its difficulties, among which may be a lack of skills necessary from the point of handling technologies, the need to acquire different skills to those related to their profession, or, also, the missed opportunity of normal social interaction and connection with co-workers, causing frustration, loneliness, and stress (6).

The profile of a teleworker may vary depending on the work; however, it requires having some basic characteristics that allow them to carry out successfully their functions of the position in this work modality. In this respect, success depends on the worker's ability to integrate excellent management of technology with communication, literacy, and audio-visual skills and with his personal and work profile, based on proactivity and constancy for the achievement of proposed objectives, as well as decision-making skills (7).

It is important to count on or develop attributes and values to adapt to work at home, creativity and commitment to developing the work properly in that space of "freedom", manage a healthy work environment, a workplace that is appropriate, comfortable, and quiet, with a convenient time management to plan and evaluate activities, that is, impose a routine and work schedules, prioritizing the urgent and managing time efficiently without affecting, for example, sleep or family relationships, and thus have a good mood and a future perspective to perform the work with the same or better quality remotely (8,9).

One of the key elements in the remote work process is the presence of intrinsic motivation, which allows, in addition to a self-management of work, the exercise of a responsibility to fulfil the required activities and maintain high productivity and efficiency (8).

For this reason, under normal conditions, not all people are suitable for remote work, as it is required, at least, a process of preparation and adequate training to ensure good work performance and adequate work well-being of workers in these conditions (9).

Having regard to the foregoing, the fact that the vast majority of firms are obliged to switch to remote working under pandemic conditions has led to the need to adapt to new working conditions for workers who have not previously performed their duties in this way, demanding to learn and show new skills to fulfil their job duties, achieve concentration, maintain discipline, learn the use of technological means, be efficient, have high expectations and manage a quiet working environment with all family members at home, learn new things in record time, among others. These demands can sometimes exceed people's ability to adapt to work, causing additional stress and adversely affecting the mental health of workers (10).

The present study focused on the education labor sector. Although this modality existed before the pandemic in the education sector, not all teachers and students were familiar with it. The arrival of the COVID-19 and compulsory isolation provision imposed an immediate change of teaching at all educational levels towards virtuality (11).

In this order of ideas, all educational institutions that have operated in person had to change their methodologies and adapt them to virtual teaching to offer students continuity in their educational processes. This implies a very significant change in all aspects of teaching: rapid learning and efficient management in virtual technology platforms for education; detailed design of contents and materials necessary to support virtual teaching without diminishing its quality; design of strategies for the monitoring, control, and feedback of learning processes by students; creative and functional assessment strategies to maintain motivation to learn.

METHODOLOGY

Quantitative research, descriptive-correlational level, cross-sectional design, ex-post fact.

Participants

The sample of the study was composed of 385 teachers of higher education and of primary and secondary basic education, who performed their work in person and had to work virtually due to the health emergency of the COVID-19 pandemic. The sampling was done intentionally through a call on social networks. In terms of geographical distribution, the sample included participants from 6 departments of Colombia: 30.8 % of teachers perished in the department of Antioquia, 20.7 % in Putumayo, 16.3 % in Cundinamarca, 13.9 % in Sucre, 11.5 % in Norte de Santander, 11.5 % in Magdalena and 6.7 % north of Santander.

In terms of gender, 60.6 % of the participants were women and 39.4 % were men; the most frequent educational level was the master's degree (55.8 %), followed by the doctorate (13.5 %), specialization (18.3 %), undergraduate (11.2 %) and technical (1.4 %).

63.5 % of the participants worked in a public educational institution and 36.5 % were in private. As for the years of work experience, 36.1 % had 2 to 5 years, 34.6 % over 9 years, 14.9 % less than one year, and 14.4 % from 5 to 8 years.

Of the educational level at which 30.4 % worked, 27.4 % worked at the undergraduate level, 20.1 % at the secondary level, 16.3 % at the primary level, and 5.8 % at the technical level. 52.4 % were teachers in the exact sciences and 47.6 % in the social sciences.

The average age of the participants was $M=34.5$ ($SD=2.8$), where 33.2 % were over 45 years old, 32.8 % were between 26 and 38 years old, 23.6 % were in the range of 39 to 45 years, 10.4 % between 18 and 25 years.

Concerning marital status, 40.8 % were single, and 59.2 % were married (and free marriage); 57.7 % had children and 42.3 % had no children.

Measures

For the measurement of the self-efficacy variable, the General Self-efficacy Scale (25) was used, presented in the Likert format of 10 items with a 4-point response option. The instrument obtained $\alpha=0.87$ in the Spanish validation (26);

$\alpha=0.91$ in the Ecuadorian population (27); and $\alpha=0.74$ in the validation of the Colombian population (28).

For the measurement of working conditions during the quarantine, the ad-hoc design for the present study of the Quarantine Virtual Teaching Work Questionnaire was carried out, considering different aspects related to the virtual work process from home such as organization of schedules, workstations, interferences, and distractions during working time; the ability to manage virtual media; interference with family life, relationship with colleagues and superiors; as well as motivational aspects, related to teaching performance in the form of remote work from home, among others. The questionnaire was configured as a Likert scale with answer options: 1 = Never or nothing; 2 = Sometimes or little; 3 = Enough times or enough; 4 = Always or Much. Initially, the questionnaire was applied to 10 people to verify their comprehension of the questions. As a second step, the scale was submitted to expert judgment and Cohen's Kappa concordance index was calculated for the measures of coherence, sufficiency, clarity of wording of items, and relevance, indicating satisfactory values among 0.763 and 0.962 (value of p between 0.0001 and 0.007), presenting a high degree of agreement between the judges.

The instrument in its initial design was applied to 85 volunteer teachers as a pilot. Exploratory factor analysis with the extraction of main components and varimax rotation initially yielded 5 factors with a total explained variance of 73 % and allowed debugging the instrument, eliminating items with factor load less than 0.4, which allowed for improved the KMO, continuing the significant test of Bartlett. Finally, the confirmatory factor analysis projected 4 factors with an explained variance of 80 %, meeting the parsimony criterion. The 4 components showed auto values above 1.

Table 1 presents the final 20 items of the scale with their corresponding factor load, distributed in 4 factors that were named: Factor 1: Work at home and organization (schedules, job, types of interference and distractors); Factor 2: Work at home and methodology (skills in the management of virtual media); Factor 3: Work at home and family, social and work environment (relationship

with family, relationship with co-workers and superiors); Factor 4: Work at home and personal satisfaction (motivation, expectations, commitment, personal growth, freedom).

Finally, the internal consistency coefficient of Alpha Cronbach was calculated, indicating a value of 0.946, which indicated a good internal consistency of the scale. Regarding the constitutive dimensions of the scale, their values oscillated between $\alpha=0.085$ and $\alpha=0.970$.

Additionally, was used a sociodemographic survey for the variables of age, gender, marital status, children, educational level, type of institution, years of experience, and area of performance.

Procedure

The study considered all the technical, procedural, and ethical regulations following resolution 8 430 of 1993 of the Ministry of Health and the Code of Ethics of the Psychologist. The informed consent was included in the online questionnaire that was applied to the teachers participating in the study. Participation was voluntary from a virtual call on social networks.

Statistical analyses

Analysis of normality indicated that all study variables showed an abnormal distribution. For information analysis, descriptive statistics were used to calculate the mean of the study variables. Considering the non-parametric distribution of the study variables, for the comparison of values of variables by groups, the Mann-Whitney U statistic was used for two groups and Kruskal-Wallis for more than two groups. The Spearman statistic was used for the correlation of the variables. The SPSS version 25 software was handled.

RESULTS

Self-efficacy showed values located at a medium level in the sample of this study

About the variables related to remote work, the lowest value showed work at home and family

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Table 1. Factorial loading of items final scale version

Ítems	Factors			
	1	2	3	4
1. I do not feel interference to carry out my work responsibilities from home.	0.717			
2. Working from home does not interfere with my family and social life.			0.748	
3. I manage technology well enough to do my job		0.756		
4. Working at home satisfies my interests and corresponds to my needs				0.715
5. I consider that I make good use of my time, fulfilling all my tasks and work functions from home	0.753			
6. Working at home allows me to develop my professional skills				0.754
7. I can easily learn what I need to do my virtual job well		0.874		
8. I consider that I have a suitable and comfortable place for my work routine	0.670			
9. I manage to carry out my work functions from home through technological means satisfactorily		0.893		
10. It is easy to reconcile working from home and domestic and family activities			0.728	
11. Work at home is in line with my expectations and aspirations				0.667
12. I can manage work hours responsibly and autonomously from home	0.723			
13. Working at home gives me an identity and makes me feel useful				0.680
14. The need to learn how to use technology to perform my duties from home does not generate stress for me		0.637		
15. Working from home has allowed me to maintain a good relationship with my coworkers			0.732	
16. Working at home makes it easier for my merits to be valued fairly				0.662
17. Working at home stimulates my work commitment				0.713
18. It is easier to relate to my superiors and work team from home			0.724	
19. Working at home allows me to work with pleasure and motivates me to work				0.730
20. Working at home gives me a feeling of freedom and makes me grow personally				0.715

Extraction Method: Principal Component Analysis
 Rotation Method: Varimax Normalization with Kaiser
 a. The rotation has converged in 5 iterations.

and work environment, indicating the presence of difficulties in terms of reconciling virtual work and different aspects related to the family environment. The highest score was obtained in the variable of work at home and methodology, indicating good management and appropriation of virtual media by the study sample. Regarding the variables Work at home and organization and Work at home and personal satisfaction, medium-high values were obtained, indicating a satisfactory level in these aspects (Table 2).

Table 2. Descriptive data of study variables

Variables	Mean (SD)
Work at home and organization	3.2 (0.6)
Work at home and methodology	3.4 (0.6)
Work at home and family and work environment	2.7 (0.7)
Work at home and personal satisfaction	3.0 (0.6)
Self-efficacy	3.3 (0.5)

The comparison of study variables according to gender groups showed a statistically significant difference in the variable Work at home and family and work environment (p=0.035) in favor of the male gender, indicating that men present better adaptation in this aspect (Table 3).

A statistically significant difference was also obtained in the variable Work at home and personal satisfaction (p=0.043), in this case in favor of the female gender, indicating that, although the women in the sample have greater difficulties in reconciling work at home and family environment, report greater personal satisfaction in remote work situations (Table 3).

Table 3. Comparison of study variables according to gender

Variables	Femenino Median (IR)	Masculino Media (IR)	Mann Whitney U	Valor p
Work at home and organization	3.2(1)	3.2(1)	5 161.000	0.991
Work at home and methodology	3.7(2.8)	3.7(2.3)	4 943.500	0.590
Work at home and family and work environment	2.5(1)	3.1 (1.1)	3 125.000	0.035
Work at home and personal satisfaction	3.3(2.7)	2.9(2.2)	3 058.500	0.043
Self-efficacy	3.3(2)	3.4(1.5)	4 492.500	0.110

Regarding the comparison of the study variables according to age, a statistically significant difference was identified in the Work at home and methodology variable (p=0.002) with higher scores in younger age groups, indicating

better handling of tools technologies related to work at these ages.

Likewise, a statistically significant difference was shown in the variable Work at home and personal satisfaction (p=0.039), indicating higher scores in younger age groups (Table 4).

Table 4. Comparison of study variables according to age

Variables	18-25 Median (IR)	26-38 Median (IR)	39-45 Median (IR)	> 45 Median (IR)	Chi-Square	P
Work at home and organization	3.7(.5)	3(2.3)	3.2(1.5)	3.5(3)	4.782	0.189
Work at home and methodology	3.7(2)	3.7(2.3)	3.4(2.1)	3(2)	14.750	0.002
Work at home and family and work environment	2.6(0.3)	2.5(2)	2.5(2.1)	2.7(2.5)	0.668	0.881
Work at home and personal satisfaction	3.5(0.4)	3.1(0.8)	2.8(2.1)	2.7(1.5)	6.799	0.039
Self-efficacy	3.5(1)	3.3(2.3)	3.6(1.4)	3.2(2)	7.223	0.065

The comparison of variables according to marital status showed a statistically significant difference in the variable Work at home and family

and work environment (p=0.048), showing higher scores in the single group (Table 5).

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Table 5. Comparison of study variables according to marital status

Variables	Single Median (IR)	Married Median (IR)	Chi-Square	P
Work at home and organization	3.2(3)	3.2(2.8)	1.017	0.907
Work at home and methodology	3.7(2)	3.5(2.8)	1.769	0.778
Work at home and family and work environment	3(2.3)	2.5(2)	6.012	0.048
Work at home and personal satisfaction	3(2.7)	3(2.7)	0.984	0.912
Self-efficacy	3.4(2)	3.2(3)	2.195	0.700

The comparison of study variables according to the educational level of the sample participants indicated a statistically significant difference in the Work at home and personal satisfaction

variable (p=0.023), showing an increase in satisfaction levels in remote work situations as the educational level of the teacher increases (Table 6).

Table 6. Comparison of study variables according to educational level

Variables	Technology Median (IR)	Bachelor Median (IR)	Specialty Median (IR)	Magister Median (IR)	PhD Median (RI)	Chi-Square	P
Work at home and organization	3.7(.5)	3.5(2)	3.4(2)	3.3(2.8)	3(3)	4.867	0.301
Work at home and methodology	3.7(1.5)	3.7(1.8)	3.5(2)	3.7(2.8)	4(2.3)	5.252	0.262
Work at home and family and work environment	3(2)	3(2.5)	2.7(2.5)	2.5(3)	2.7(2.5)	2.804	0.591
Work at home and personal satisfaction	2.5(2.2)	2.7(2.2)	2.8(2)	3(2.7)	3.4(2.2)	3.672	0.023
Self-efficacy	3.6(2.2)	3.2(1.3)	3.4(1.5)	3.3(3)	3.6(2)	1.931	0.748

The comparison of study variables according to having children showed a statistically significant difference in the variables of Work at home and the organization (p=0.025) and Work at home and family and work environment (p=0.045) in favor of the group who do not have children.

Similarly, a statistically significant difference was obtained in the variable Work at home and personal satisfaction (p=0.041), but in this case, in favor of the group that has children, indicating that people with children obtain greater personal satisfaction in a situation of remote work (Table 7).

Table 7. Comparison of study variables according to having children

Variables	Yes Median (IR)	No Median (IR)	Mann Whitney U	p
Work at home and organization	2.8(2.1)	3.2(3)	3 469.500	0.025
Work at home and methodology	3.6(2.8)	3.7(2.6)	5 077.000	0.627
Work at home and family and work environment	2.5(3)	2.9(3)	3 877.500	0.045
Work at home and personal satisfaction	3.3(2.5)	2.9(2.2)	3 923.000	0.041
Self-efficacy	3.4(3)	3.3(2)	5 080.000	0.639

In the comparison of study variables according to the groups of time of work experience, a statistically significant difference was identified in the variables of Work at home and methodology ($p=0.039$), Work at home and family and work

environment ($p=0.045$) and Work at home and personal satisfaction ($p=0.027$), showing the same trend towards higher scores in the groups with less work experience (Table 8).

Table 8. Comparison of study variables according to years of work experience

Variables	0-1 year Median (IR)	2-5 years Median (IR)	5-8 years Median (RI)	9 and more Median (IR)	Chi- Square	P
Work at home and organization	3.2(2)	3.2(2.5)	3.0(2.3)	3.2(3)	4.557	0.207
Work at home and methodology	3.7(1.8)	3.7(2.3)	3.3(1.5)	3.5(2.8)	8.382	0.039
Work at home and family and work environment	2.8(2.8)	2.7(3)	2.2(3)	2.3(3)	6.377	0.045
Work at home and personal satisfaction	3.2(2)	3.1(2.7)	2.6(2.7)	2.5(2.7)	7.342	0.027
Self-efficacy	3.5(1.4)	3.4(2)	3.1(2.3)	3.3(3)	2.698	0.441

In the comparison of study variables according to the type of institution where one works, a statistically significant difference was identified in the variables of Work at home and methodology

($p=0.001$), Work at home and family and work environment ($p=0.014$) and Work at home and personal satisfaction ($p=0.013$), in favor of private institutions (Table 9).

Table 9. Comparison of study variables according to the type of institution

Variables	Public Median (IR)	Private Median (IR)	Mann Whitney U	P
Work at home and organization	3.2(2.8)	3.2(3)	4 869.500	0.724
Work at home and methodology	3.4(2.8)	3.9(2.2)	3 679.500	0.001
Work at home and family and work environment	2.3(2)	2.7(2.3)	3 478.500	0.014
Work at home and personal satisfaction	2.8(2.2)	3.3(2.4)	3 982.000	0.013
Self-efficacy	3.3(2.5)	3.4(1.3)	4 868.000	0.721

The comparison of study variables according to the groups of educational levels where the teachers in the study sample worked showed a statistically significant difference in the perception of self-efficacy ($p=0.026$) in favor of undergraduate and postgraduate levels. The statistically significant difference was also

identified in the variables of Work at home and methodology ($p=0.005$), Work at home, and personal satisfaction ($p=0.042$), where both variables show an increase in scores as the educational level in which they work increases (Table 10).

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Table 10. Comparison of study variables according to the educational level in which they work

Variables	Primary Me (RI)	Secondary Me (RI)	Tecnology Me (RI)	Bachelor Me (RI)	Postgraduate Me (RI)	Chi-Square	P
Work at home and organization	3.5(2.8)	3(2.5)	3.7(1.5)	3.2(2.3)	3.5(3)	6.030	0.197
Work at home and methodology	3(2.8)	3(2)	3.5(1.5)	3.7(2.3)	4 (1.5)	14.699	0.005
Work at home and family and work environment	2.5(2)	2.5(2.3)	3(2)	2.5(2.4)	3(3)	3.917	0.417
Work at home and personal satisfaction	2.9(2.5)	2.8(2.7)	2.8(2)	3.2(2.6)	3.5(2.2)	7.544	0.042
Self-efficacy	3(3)	3(2)	3.1(2)	3.3(2)	3.6(2.3)	11.097	0.026

The comparison of study variables according to the area of performance did not indicate a statistically significant difference in any variable

between the groups of social sciences and exact sciences (Table 11).

Table 11. Comparison of study variables by area of performance

Variables	Social Sciences Me (RI)	Natural Sciences Me (RI)	Mann Whitney U	Valor p
Work at home and organization	3.2(3)	3.2(2.5)	5145.500	0.561
Work at home and methodology	3.5(2.8)	3.7(2.3)	5074.500	0.447
Work at home and family and work environment	2.5(2.1)	2.5(2.3)	5262.000	0.757
Work at home and personal satisfaction	3.0(2.7)	2.9(2.7)	5309.500	0.842
Self-efficacy	3.3(3)	3.4(2.8)	5193.500	0.639

And finally, a positive, median, and statistically significant correlation was found between self-efficacy and all the constitutive variables of the remote work test, indicating that a higher level

of perceived self-efficacy is related to better performance in each of the variables of remote work (Table 12).

Table 12. Correlation between variables of virtual work at home and self-efficacy

Correlated variables	Rho Spearman	p
Work at home and organization/self-efficacy	0.468**	0.0001
Work at home and methodology/self-efficacy	0.476**	0.0001
Work at home and environment/self-efficacy	0.436**	0.0001
Work at home and personal satisfaction/self-efficacy	0.583**	0.0001

** The correlation is significant at the 0.01 level (bilateral).

DISCUSSION

The results of this study showed that, at a general level, the teachers participating in the study showed average values in terms of

self-perceived efficacy. Studies of teacher self-efficacy during the pandemic have indicated that the abrupt and rapid changes that occurred in the transition from face-to-face to virtual teaching and the emergence of multiple difficulties associated with this process were related to the decrease in

the perception of their effectiveness in teaching performance (29-32).

In this regard, authors highlight the importance of well-perceived self-efficacy for success in teaching performance (33), this being a relevant factor that made it possible to mitigate the stress caused by multiple emerging difficulties associated with teaching performance during the COVID-19 pandemic (31).

On the other hand, self-perceived efficacy did not show a difference according to the gender of the teachers, which is consistent with other studies (34).

About the variables related to remote work, the lowest scores were identified in the variable Work at home and family and work environment, indicating the presence of difficulties regarding the reconciliation between virtual work and different aspects related to the family environment. Similarly, the results of this study showed that the group of married teachers with children reported greater difficulties in this variable and the variable of work at home and organization.

According to DANE (Departamento Administrativo Nacional de Estadística) (35), at the beginning of the quarantine/preventive isolation, 20.6 % of Colombians reported an increase in occupation overload from the start of the remote working day, with women showing the highest level of occupation. In the present study, likewise, men reported better adaptation and greater efficiency in reconciling their family life and working from home. This situation has been highlighted in other studies, where it is indicated that women have reported greater difficulties in terms of adapting to the work process from home since they had to assume household chores and curricular activities for their minor children who were also at home with virtual study and required great help, in addition to this, in some of the cases there have been difficulties with family life, which increased tension and work stress (36).

On the other hand, although the female teachers participating in the study reported greater difficulties in reconciling work and family environment, at the same time they indicated greater personal satisfaction related to the modality of remote work at home, as well as the teachers with children.

In this regard, studies related to the subject indicate that teleworking during the pandemic has had a positive impact on people's quality of life, considering aspects such as reduction of economic resources and time invested in commuting, improvement of eating habits, and sleep, use of free time, quality of family relationships, better attention and supervision of children, among others (37), improving the job satisfaction of workers (38,39).

However, some studies indicate that job satisfaction in the case of women was lower during the pandemic in remote work conditions due to interference with family obligations (40). Regarding these contradictory findings, it is important to consider the intervening variables, such as type of occupation, conditions of organizational support. In this order of ideas, research on the population of university teachers reports an increase in job satisfaction in the remote work modality (41), which is following the results of the present study.

The participants of the present study reported high scores in the variable of work at home and methodology, indicating good management and appropriation of virtual media and educational platforms, and a satisfactory level in aspects related to the organization of their schedules, workstations, and Control over interference and distractions. Other studies on the population of teachers during the pandemic have also indicated that this modality has allowed teachers to have the possibility of having greater autonomy, control of their work, and management of class management, adapting to the changes caused by the pandemic (42).

The comparison of the study variables according to age showed that the younger teachers reported a better use of technological tools and also greater personal satisfaction related to remote work. This finding is consistent with other studies that indicate the importance of having good management of technology in the educational field, since a considerable percentage of teachers, especially older ones, still have a basic or intermediate command of technology (42).

The educational level of the teachers participating in the study was associated with higher levels of personal satisfaction in the remote work modality, which could be related to greater

preparation and management of professional and technological skills (43).

On the other hand, less work experience was associated with greater skills in managing methodological aspects, better reconciliation between work and family environment, and greater job satisfaction in the sample of this study. This situation was probably due to the interference of the teaching experience in the face-to-face modality and resistance to breaking mental and methodological paradigms, one of the aspects highlighted by the studies related to the mental flexibility of teachers and their willingness to change teaching methodologies, where it has been identified that teachers with more experience in traditional methodological approaches have greater resistance to change (44). In the situation of the pandemic and the unforeseen and rapid transition to the virtual modality in education, teachers had to learn and relearn many things related not only to the management of technology but also to teaching methodologies, where, as indicated by results in the present study, teachers with less experience were more open to these changes.

In the comparison of study variables according to the type of institution where one works, a statistically significant difference was identified in the variables of Work at home and methodology, Work at home and family and work environment, and Work at home and personal satisfaction, in favor of private institutions, which could probably be related to the fact that private institutions have greater technological resources for the implementation of work at home, better salaries generating greater motivation, and a working day with fewer hours per week. The authors highlight enormous inequalities in business benefits in the public and private sectors, marked mainly by well-being and quality of working life (45).

The educational level variable where the teacher works were associated with the perception of self-perceived efficacy in remote work conditions, this being higher in teachers at the highest educational levels, undergraduate and postgraduate. Likewise, at these levels, better management of work methodology and personal satisfaction were reported.

This could be related to the fact that the management of students at lower educational levels is much more complex, presenting greater challenges for methodological adaptations, and time spent in virtual teaching conditions, among others, representing greater physical and mental exhaustion for teachers, as some studies highlight, indicating that during the COVID-19 pandemic, teachers faced various inconveniences to carry out their work, such as internet connection problems, lack of communication with parents or legal guardians and students, demotivation of students, overload of activities, among others (29,30).

And finally, the results of this study indicate the presence of a positive, median, and statistically significant correlation between self-efficacy and all the variables of virtual work. These findings are consistent with other studies that confirm the positive role that self-efficacy plays in job performance.

The feelings of self-efficacy in teachers harbor valuable information about how capable they feel to carry out teaching tasks and generate learning in students, their influence is fundamental in pedagogical performance, favoring learning and academic achievement of students (3,4). Self-efficacy beliefs are understood as the confidence that teachers have in their ability to help students learn, make significant differences in teaching, and use didactic strategies used to enhance the quality of student learning students (46).

In conditions of an abrupt change towards the virtual modality of teaching, also situated in the complex conditions of the COVID-19 pandemic, a positive perception of their self-efficacy as a teacher allowed teachers to adapt to the new changes and work demands and carry out their teaching work in the best possible way, allowing them to reduce stress and negative effects on mental health (31,32).

CONCLUSIONS

The pandemic has been a process of great magnitude, which has deeply affected institutions, processes, teachers, and students, forcing them to face hasty and accelerated changes, to continue

the academic process with new modalities and initiatives that will continue to have changes in the coming years to move from traditional forms of education and achieve distance education with new virtual teaching models.

The results of the present study indicated that to successfully face the change to the adaptations of the face-to-face teaching process to the virtual modality in conditions of the COVID-19 pandemic, the teachers participating in the study had to have several factors such as skills technological (47-49); mental openness towards new teaching methodologies (44); decision-making, self-organization, and time-management skills to navigate the difficulties associated with remote teaching, especially with elementary and high school students (29, 30), and to combine work with family life; and a good level of self-perceived efficacy (31).

REFERENCES

1. Shigemura J, Ursano R, Morganstein J, Kurosawa M, Benedek D. Public responses to the novel 2019 coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry Clin Neurosci*. 2022;74(4):281-282.
2. Pich C, Budimir S, Probst T. The effect of age, gender, income, work, and physical activity on mental health during coronavirus disease (COVID-19) lockdown in Austria. *J Psychosom Res*. 2020;136:110186.
3. Escobar Toro S. Situación de salud mental en el área Metropolitana del Valle de Aburrá durante el aislamiento preventivo decretado en Colombia por la pandemia del COVID-19: un análisis exploratorio. Bachelor's Thesis, Universidad Eafit. 2020. Available from: <https://repository.eafit.edu.co/handle/10784/17450>
4. Cañete R, Noda A, Amauri N, Ferreira V, Brito K, García A. SARS-CoV-2, el virus emergente que causa la pandemia de COVID-19. *Rev Méd Electr*. 2020;42(3):1862-1881.
5. Barton L, Duval E, Stroberg E, Ghosh S, Mukhopadhyay S. COVID-19 Autopsies, Oklahoma, USA. *Am J Clin Pathol*. 2020;153(6):725-733.
6. Carrasco-Mullins R. Teletrabajo: ventajas y desventajas en las organizaciones y colaboradores. *Revista FAECOSapiens*. 2021;4(2):1-9.
7. Pérez M, Otálora S. Análisis de la transición del trabajo presencial al teletrabajo en las PYMES del sector real en Bogotá. Tesis de Maestría. Administración de Empresas. Universidad EAN. 2021. Available from: <https://repository.universidadean.edu.co/bitstream/handle/10882/11373/PerezMagda2021.pdf?sequence=1>
8. Caraiani Ch, Lungu C, Dascalu C, Stoian C. The impact of telework on organisational performance, behaviour, and culture: evidence from business services industry based on employees' perceptions. *Economic Research-Ekonomska Istraživanja*. 2023;(36)2:2142815.
9. Türkes M, Vuta D. Telework: Before and after COVID-19. *Encyclopedia*. 2022;2:1370-1383.
10. Balluerka N, Gómez J, Hidalgo M, Gorostiaga A, Espada J, Padilla J, et al. Las consecuencias psicológicas de la COVID-19 y el confinamiento. Servicio de Publicaciones de la Universidad del País Vasco. 2020. Available from: https://www.ciencia.gob.es/stfls/MICINN/Universidades/Ficheros/Consecuencias_psicologicasCOVID19.pdf
11. Reissig M, Ruggiero A, de Torres M, Chaia E, Crego P, Quiroga P, et al. Aprender en tiempos de pandemia: opiniones de estudiantes de la Licenciatura en Ciencias Biológicas (UNCo Bariloche) sobre la enseñanza virtual. *Rev Educac Biol*. 2020;2:184-210.
12. Sala D. Nuevos desafíos para cuestiones pedagógicas históricas. La evaluación en contexto de pandemia. *Trayectorias Universitarias*. 2020;6(10): e021.
13. Gagliardi V. Desafíos educativos en tiempos de pandemia. *Question/Cuestión, Informe Especial Incidentes*. 2020;III:1-6.
14. Hodges Ch, Moore S, Lockee B, Trust T, Bond A. The Difference Between Emergency Remote Teaching and Online Learning. *Educause Review*. 2020; 3. Available from: <https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning>
15. Shoulders C, Estep Ch, Johnson D. Teachers' Stress, Coping Strategies, and Job Satisfaction in COVID-induced Teaching Environments. *J Agricultural Education*. 2021;62(4):67-80.
16. Kavita K, Hassan N C. Work Stress among Teachers: A Comparison between Primary and Secondary School Teachers. *Internat J Acad Res Progres Educ Develop*. 2018;7(4):60-66.
17. Zhao W, Liao X, Li Q, Jiang W, Ding W. The Relationship Between Teacher Job Stress and Burnout: A Moderated Mediation Model. *Front Psychol*. 2022;12:784243.
18. Carroll A, Forrest K, Sanders-O'Connor E, Flynn L, Bower J M, Fynes-Clinton S, et al. Teacher stress and burnout in Australia: Examining the role of intrapersonal and environmental factors. *Soc Psychol Educ An Intern J*. 2022;25(2-3):441-469.
19. Wanke E, Schmidt M, Bendels M, Oremek G, Groneberg D. Health behaviors in dance teachers and

- their use of psychoactive substances. *Work* (Reading, Mass.). 2019;64(4):697-704.
20. Vieira A, Lima D, Batista G, Azevedo L, Luís M. Stress and psychoactive substance use among university professors. *Revista brasileira de medicina do trabalho: publicacao oficial da Associacao Nacional de Medicina do Trabalho-ANAMT*. 2021;19(2):191-200.
 21. Harahsheh A. Perceived Self-Efficacy and Its Relationship to Achievement Motivation among Parallel Program Students at Prince Sattam University. *Int J Psychological Studies*. 2017;9:21.
 22. Peiffer H, Ellwart T, Preckel F. Ability self-concept and self-efficacy in higher education: An empirical differentiation based on their factorial structure. *PLoS One*. 2020;15(7):e0234604.
 23. Yang Z-Y, Wang Y-T, Xia L, Zheng Y-C, Feng Z-Z. The Relationships between Prospecption, Self-Efficacy, and Depression in College Students with Cross-Lagged Analysis. *Int J Environ Res Public Health*. 2022;19:14685.
 24. Fekry C, Mahfouz E, Kamal N, Abd-El Rahman T, Hassan E. Contribution of low-level Self-esteem and self-efficacy in adverse mental outcome among secondary school adolescents in Minia city. *Minia J Med Res*. 2023;34(1):15-24.
 25. Baessler J, Schwarzer R. Evaluación de la autoeficacia: adaptación española de la Escala de Autoeficacia General. *Ansiedad y Estrés*. 1996;2(1):1-7.
 26. Sanjuán P, Pérez A, Bermúdez J. Escala de autoeficacia general: datos psicométricos de la adaptación para población española. *Psicothema*. 2012;12(2):509-513.
 27. Bueno-Pacheco A, Lima-Castro S, Peña-Contreras E, Cedillo-Quizhpe C, Aguilar-Sizer M. Adaptación al Español de la Escala de Autoeficacia General para su Uso en el Contexto Ecuatoriano. *Rev Iberoamericana de Diagnóstico y Evaluación – e Avaliação Psicológica*. 2018;48(3):5-17.
 28. Escobar Y, Zambrano D. Propiedades psicométricas de la de autoeficacia general (Baessler y Schwarzer, 1996) en una muestra de adolescentes de San Juan de Pasto. Tesis de grado, Universidad de Nariño. 2015. Available from: <http://biblioteca.udenar.edu.co:8085/atenea/biblioteca/90702.pdf>
 29. González R, Gastélum G, Velducea W, González J, Domínguez S. Análisis de la experiencia docente en clases de Educación Física durante el confinamiento por COVID-19 en México. Federación Española de Asociaciones de Docentes de Educación Física (FEADEF). 2021. Available from: <https://recyt.fecyt.es/index.php/retos/index>
 30. Allouh A, Qadhi S, Hasan M, Du X. Teachers' Self-Efficacy and Online Teaching during COVID-19 Pandemic in Qatari Governmental Schools. *International J Learning, Teaching and Educational Research*. 2021;20(11):17-41.
 31. Dolighan T, Owen M. Teacher Efficacy for Online Teaching During the COVID-19 Pandemic. *J Educat Res Pract*. 2021;30(1):95-116.
 32. Rabaglietti E, Lattke LS, Tesauri B, Settanni M, De Lorenzo A. A Balancing Act During COVID-19: Teachers' Self-Efficacy, Perception of Stress in the Distance Learning Experience. *Front Psychol*. 2021;12:644108.
 33. del Río de la Paz B, Rodríguez M, Rodríguez K, Águila O. La autoeficacia docente: un reto en el accionar del profesor universitario de las ciencias médicas. *Edumecentro*. 2018;10(2):171-187.
 34. Nur Wangid M, Mustadi A, Purbani W. Effect of Gender and Department on Motivation, Self-Efficacy, And Perception as Teacher of Pre-Service Teacher Students. *Multicultural Education*. 2021;7(6):68.
 35. Departamento Administrativo Nacional de Estadística [DANE]. Nota Estadística. Salud Mental en Colombia: un análisis de los efectos de la pandemia. Gobierno de Colombia. 2021. Available from: <https://www.dane.gov.co/files/investigaciones/notas-estadisticas/ago-2021-nota-estadistica-salud-mental-en-colombia-analisis-efectos-pandemia.pdf>
 36. Galvis G, Vásquez A, Caviativa Y, Ospina P, Chaves V, Carreño L, Vera J. Tensiones y realidades de los docentes universitarios frente a la pandemia COVID-19. *Eur J Health Res*. 2021;7(1):15-30.
 37. Rodríguez A. Estudio comparativo del impacto del teletrabajo sobre la calidad de vida de hombres y mujeres, servidores públicos del Instituto de Desarrollo Urbano en la ciudad de Bogotá D.C. Tesis de grado, Maestría en Estudios y Gestión del desarrollo, Universidad de La Salle, 2022. Available from: https://ciencia.lasalle.edu.co/maest_gestion_desarrollo/224
 38. Zürcher A, Galliker S, Jacobshagen N, Mathieu P, Eller A, Elfering A. Increased Working from Home in Vocational Counseling Psychologists During COVID-19: Associated Change in Productivity and Job Satisfaction. *Frontiers in Psychology*. 2021;12:75012.
 39. Kondratowicz B, Godlewska-Werner D, Połomski P, Khosla M. Satisfaction with job, life and remote work in the COVID-19 pandemic. The role of perceived stress, self-efficacy and self-esteem. *Current Issues in Personality Psychology*. 2022;10(1):49-60.
 40. Villavicencio N, Arce P. Equilibrio entre conciliación familiar y satisfacción laboral de mujeres con trabajo remunerado durante la crisis sanitaria de 2020 en la

- ciudad de la Paz. Ajayu Órgano de Difusión Científica del Departamento de Psicología. Universidad Católica Boliviana San Pablo. 2021;19(2):286-315.
41. López L, López-Paz P, López M. Trabajo remoto y satisfacción laboral de los docentes universitarios peruanos durante la pandemia del COVID-19. *Rev Innova Educ.* 2023;5(1):158-169.
 42. De Heros M, Murillo S, Villanueva N. Satisfacción laboral en tiempos de pandemia: el caso de docentes universitarios del área de salud. *Rev Econ Caribe.* 2020;26:1-10.
 43. Dos Santos B, Ribeiro S, Scorsolini F, Cassia R. Ser docente en el contexto de la pandemia de COVID-19. Reflexiones sobre la salud mental. *Index Enferm.* 2021;29(3):1-10.
 44. Córca J. Resistencia docente al cambio: Caracterización y estrategias para un problema no resuelto. *Rev Iberoam Educ Distan.* 2020;23(2):255-272.
 45. Moreno D, Obregon J, Cantor L, Murgas S. El bienestar laboral y la calidad de vida en los trabajadores de 25 A 30 años en el Sector público y Privado en Colombia. Trabajo de grado, Facultad de psicología, Politécnico Grancolombiano. 2020. Available from: https://alejandria.poligran.edu.co/bitstream/handle/10823/2122/BIENES_1.pdf?sequence=1&isAllowed=y
 46. Orakçı Ş, Yüreğilli Göksu D, Karagöz S. A mixed methods study of the teachers' self-efficacy views and their ability to improve self-efficacy beliefs during teaching. *Front Psychol.* 2023;13:1035829.
 47. Andreou E, Roussi C, Tsermentseli S, Menabò L, Guarini A. Teachers' Self-Efficacy during the COVID-19 Pandemic in Greece: The Role of Risk Perception and Teachers' Relationship with Technology. *Education Sciences.* 2022;12(9):600.
 48. Cudris-Moreno DM, Cudris-Torres L, Bustos-Arcón V, Olivella- López G, Medina-Pulido PL, Moreno-Londoño HA. Educational technology and academic performance in students of public educational institutions during confinement by COVID-19. *Gac Méd Caracas.* 2020;128(2S):S336-S349.
 49. Cudris-Torres L, Barrios-Núñez Álvaro, Bonilla-Cruz NJ. Coronavirus: epidemia emocional y social. *Arch Ven Farmacol Ter.* 2020;39(3):309-312.

Lifestyle and mental health in conditions of the COVID-19 pandemic in a sample of people from the city of Medellín, Colombia

Estilo de vida y la salud mental en condiciones de pandemia de COVID-19 en una muestra de personas de la ciudad de Medellín, Colombia

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SUMMARY

It is important to analyze the experience of the COVID-19 pandemic, identifying factors that allowed the population to mitigate its negative effects on mental health. The present study was oriented to identify factors related to lifestyle and its relationship with mental health in a sample of adults in the city of Medellín, Colombia, during quarantine in the context of the COVID-19 pandemic. The study was quantitative, cross-sectional, non-experimental, and descriptive level. The Pender (1996) lifestyle profile questionnaire (PEPSI-I) and the Derogatis (1994) SCL-90-R symptom inventory were applied to the sample of 100 people, selected utilizing a call on social networks. The results indicate that better lifestyle habits related to self-actualization, interpersonal support, stress management, health responsibility, and exercise during

the pandemic and in quarantine situations were related to a decrease in negative mental health symptoms.

Keywords: *Mental health, lifestyles, social distancing, COVID-19.*

RESUMEN

Es importante analizar la experiencia de la pandemia de COVID-19 identificando factores que permitieron a la población mitigar los efectos negativos de esta en la salud mental. El presente estudio se orientó a identificar factores relacionados con estilo de vida y su relación con la salud mental en una muestra de personas adultas en la ciudad de Medellín, Colombia, durante la cuarentena en el contexto de la pandemia COVID-19. El estudio fue cuantitativo, de corte

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transversal, no experimental, nivel descriptivo. A la muestra de 100 personas, seleccionada mediante la convocatoria en redes sociales, se aplicó el cuestionario de perfil de estilo de vida (PEPSI-I) de Pender (1996) y el inventario de síntomas SCL-90-R de Derogatis (1994). Los resultados indican que mejores hábitos de vida relacionados con autoactualización, soporte interpersonal, manejo de estrés, responsabilidad en salud y ejercicio durante el tiempo de pandemia y en situación de cuarentena se relacionaron con disminución de la sintomatología negativa en salud mental.

Palabras clave: *Salud mental, estilos de vida, distanciamiento social, COVID-19.*

INTRODUCTION

Concern about the mental health of the population at an international level has become a highly relevant issue in the last decade of the current century due to the increase in risk factors. In this sense, studies show an important relationship between mental health and lifestyle habits associated with healthy lifestyles, indicating the importance of studying specific behaviors directly related to the development or maintenance of which are healthy lifestyles and habits that promote general biopsychosocial well-being (1).

The World Health Organization defines healthy lifestyles as a process of interaction between objective and broader living conditions and individual behavior patterns, the latter being subject to change and modification (2).

According to the above-mentioned (3) these patterns or behaviors such as diet, physical activity, sleep, substance use, and excess alcohol, among others, act as factors that affect health, forming part of a lifestyle. It is necessary to highlight that the areas of life at the individual level can suffer significant alterations from objective and uncontrollable changes in the external conditions of people life (4).

In this order of ideas (5), the health emergency experienced by humanity from COVID-19 pandemic has caused negative effects on the level of mental health in the population around the world, at the same time, their habits and styles of life affected by mandatory social distancing,

quarantine and change in socioeconomic living conditions (6).

Studies carried out in different countries since the start of the pandemic indicate an increase in rates of generalized anxiety, depression, fear of death and contagion, sleep disturbances and eating habits, suicidal ideation, and a general decrease in quality of life (7).

Among the effects of quarantine or mandatory social distancing decreed by the governments of all countries in the absence of specific medical treatments, some authors highlight loneliness and its incidence in the emergency of anxiety, depression, and affectation of quality of life (8). Studies suggest that prolonged confinement is related to psychological damage, considering that individuals are subjected to stressful factors for a long period, and in some cases, psychic affectations are present many months after the end of this confinement (9).

Thus, the effects of the COVID-19 pandemic on mental health, reflected in people's lifestyles, are usually devastating, according to what the studies carried out to date have indicated (10).

The quarantine situation was associated with significant psychological consequences for people (11); where the stress caused by the pandemic produced manifestations of anxiety and fear, sadness reactions, and depressive symptoms, including the propensity to develop addictive behaviors. The situation of the global pandemic, being an event that alters the normal life habits of people, associated with a real threat to their lives, implies considering the possibility, for a sector of the population, of developing medium- and long-term anxiety, mood disturbance, and post-traumatic stress disorder (12).

Although humanity currently has vaccines that have made it possible to control the virus and reduce mortality, the eventual possibility that another event equal to or worse than the COVID-19 pandemic could happen again is very real, and it is necessary to carry out studies related to the protective factors of people's mental health, to mitigate the devastating effects derived from this type of event (13).

In this order of ideas, few existing studies indicate that the use of healthy lifestyle habits during the pandemic and in a quarantine situation

has made it possible to improve and even prevent adverse psychological reactions that affect the mental health and quality of life of people (6). For example, the study indicates that increased physical activity during quarantine isolation was associated with better mental health, being associated with less anxiety, depression, stress, and insomnia, and greater perceived well-being. Fullana et al. (14) also state that the use of lifestyle habits such as a healthy and balanced diet, following entertainment routines, not reading news and updates about COVID-19 very frequently, taking advantage of the time to devote to hobbies, and staying the air free or looking outside were identified as better predictors of lower levels of depressive symptoms (14).

In line with the above, the present study carried out in Medellín, Colombia, was oriented to investigate the characteristics of the lifestyle in a sample of people between 18 and 60 years of age and its relationship with mental health symptoms that the participants manifested during COVID-19 pandemic time in the situation of mandatory social distancing or quarantine. The contribution of this research consists in the fact that not only aspects generally considered, such as physical activity, nutrition, and daily routines, but also variables such as stress management, health responsibility, interpersonal support, and self-actualization, as broader elements that characterize lifestyle and attitudes related to self-care, not only physical but also psychological and spiritual.

METHODOLOGY

Type of Study

Research with a quantitative approach, descriptive level, cross-section, and non-experimental method, ex post facto.

Participants

The study sample was made up of 100 people of legal age, inhabitants of the city of Medellín, selected employing a "snowball" sampling from the call on social networks, due to the situation of mandatory social distancing during the months of the COVID-19 pandemic between August and

October 2020. 100 % of the participants belonged to the urban area of residence. Regarding age, the highest percentage (56.9 %) were people between 18 and 29 years old, followed by the age group between 30 and 40 years (30.4 %) and a lower frequency in the age range between 41 and 60 years (12.7 %). The female gender represented 55.9 % of the sample and 44.1 % corresponded to the male gender. According to educational level, the highest percentage was occupied by people with a university degree (52 %), with a postgraduate degree (16.7 %), technologists (12.7 %), technicians (9.8 %), and with secondary education (8.8 %). In their marital status, they were single with 62.7 %, married people (11.8 %), divorced (2 %), separated (3.9 %), in a free union (17.6 %), and widowed (2 %). Most of the participating people did not have children 78.4 %, followed by people with 1 child (13.7 %), with 2 children (5.9 %), and with 3 (2 %). The occupation with the highest percentage was employed professionals (60.8 %), and in second place, students (25 %).

Instruments

For the assessment of symptoms related to mental health, the symptom inventory SCL-90-R by Derogatis (1994) was used, adapted to Spanish by Casullo and Pérez (2008). The analysis of the psychometric properties of the inventory in the Argentine population showed good levels of internal consistency for all the subscales (Cronbach's Alpha from 0.72 to 0.86) and for the general index $\alpha=0.96$. The 90-item inventory is organized in the Likert scale format with 5 response options: none, very little, little, quite a lot, and a lot, and evaluates a total of nine symptoms: somatizations, obsessions, and compulsions, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism, the instrument applying to people between 13 and 65 years of age (15).

To analyze the life habits of the people surveyed, the Pender (1996) lifestyle profile questionnaire (PEPSI-I) was applied, made up of 48 items and organized in the Likert scale format with a sequence of 4 types of response: never, sometimes, frequently, routinely. The scale has 6 subscales: exercise, nutrition, stress management,

health responsibility, interpersonal support, and self-actualization. In the Peruvian population, the questionnaire indicated a global Cronbach's Alpha of 0.94, indicating good reliability and in the Colombian population, an α between 0.67 and 0.83 was shown for the subscales.

Procedure and ethical aspects

The collection of information was carried out through the application of the online google forms questionnaire through the call on social networks. Complying with the ethical regulations corresponding to studies with human beings, the informed consent was signed, also virtually.

Analysis of data

The normality test of the distribution of the study variables indicated that all the variables showed a non-parametric distribution. Based on the above, for the comparison of values of variables by groups, the Mann-Whitney U statistic was used in the case of two groups, and the Kruskal-Wallis in the case of more than two groups. For the correlation of variables, the Spearman statistic was used.

RESULTS

Descriptive data of the study variables

Regarding the lifestyle variables, it was found that the people surveyed scored at a medium-high level in self-actualization (M 3.2 (SD 0.6) and interpersonal support (M 3.1 (SD 0.5)). Identified the median scores in the variables of nutrition (M 2.9 (SD 0.6), exercise (M 2.7 (SD 0.7), and stress management (M 2.5 (SD 0.5), with a low score in the responsibility in health (M 2.2 (SD 0.4) (Table 1).

The descriptive values of mental health symptoms indicated higher values in obsessions and compulsions (M 1.2 (SD 0.8), followed by depression (M 0.9 (SD 0.8), interpersonal sensitivity (M 0.8 (SD 0.7), somatizations (M 0.8 (SD 0.6), paranoid ideation (M 0.8 (SD 0.6), anxiety (M 0.7 (SD 0.7), hostility (M 0.6 (SD 0.5) and phobic anxiety (M 0.5 (SD 0.3) (Table 2).

Table 1. Descriptive values of lifestyle variables

Variables	Mean (SD)	Reference values
Nutrition	2.9(0.6)	1-4
Exercise	2.7(0.7)	1-4
responsibility in health	2.2(0.4)	1-4
Stress management	2.5(0.5)	1-4
interpersonal support	3.1(0.5)	1-4
auto-update	3.2(0.6)	1-4

Source: self-made

Table 2. Descriptive values of the symptoms

Variables	Mean (SD)	benchmark score
Somatizations	0.8 (0.6)	0-4
Obsessions and compulsions	1.2 (0.8)	0-4
Interpersonal sensitivity	0.8 (0.7)	0-4
Depression	0.9 (0.8)	0-4
Anxiety	0.7 (0.7)	0-4
Hostility	0.6 (0.5)	0-4
Phobic anxiety	0.5 (0.3)	0-4
Paranoid ideation	0.8 (0.6)	0-4
Psychoticism	0.6 (0.4)	0-4

Source: self-made

Regarding mental health symptoms and considering the reference values with T scores, it was observed that none of the variables related to the symptoms showed scores higher than 63, indicating the absence of risk in the study sample (Table 3).

Comparison of variable values according to groups of sociodemographic variables

The comparison of lifestyle variables according to gender (Table 4), indicated a statistically significant difference ($p=0.004$) in the nutrition variable, health responsibility ($p=0.040$), and interpersonal support ($p=0.010$) in favor of the female gender.

Regarding mental health symptoms, the presence of a statistically significant difference was identified in the variables of somatizations ($p=0.008$), obsessions and compulsions ($p=0.025$), interpersonal sensitivity ($p=0.015$), depression ($p=0.011$), anxiety ($p=0.013$) and phobic anxiety ($p=0.007$), all scoring higher in the female gender.

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Table 3. Descriptive values of the symptoms

Variables	Male Median (IR)	T	Female Median (IR)	T
Somatizations	0.5(0.8)	50-55	0.7(1)	45-50
Obsessions and compulsions	1.0(1.0)	50-55	1.2(0.8)	50
Interpersonal sensitivity	0.4(0.9)	45-50	0.9(1.1)	45-50
Depression	0.6(0.8)	50-55	1.0(1.1)	50
Anxiety	0.3(0.6)	45-50	0.6(1)	45-50
Hostility	0.3(0.6)	45-50	0.5(0.7)	45
Phobic anxiety	0.0(0.3)	30	0.3(1,1)	50-55
Paranoid ideation	0.5(0.8)	45-50	0.8(1.1)	45-50
Psychoticism	0.3(0.6)	50	0.5(1)	45-50

Source: self-made

Table 4. Comparison of lifestyle variables according to gender

Variables	Male Median (IR)	Female Median (IR)	U for Mann Whitney	p-value
Nutrition	2.7(.9)	3.3(1)	855,500	0.004
Exercise	2.8(1)	2.8(1.4)	1 239,500	0.771
Responsibility in health	2.1(0.6)	2.5(0.3)	978,000	0.040
Stress management	2.4(0.7)	2,4(0.3)	1 090,500	0.195
Interpersonal support	3.0(0.6)	3.3(0.8)	902,000	0.010
Auto-update	3.2(0.8)	3.4(.7)	1 105,500	0.233
Somatizations	0.5(0.8)	0.7(1)	891,000	0.008
Obsessions and compulsions	1.0(1.0)	1.2(.8)	949,500	0.025
Interpersonal sensitivity	0.4(0.9)	0.9(1.1)	922,500	0.015
Depression	0.6(0.8)	1.0(1.1)	903,500	0.011
Anxiety	0.3(0.6)	0.6(1)	913,500	0.013
Hostility	0.3(0.6)	0.5(0.7)	1 133,000	0.312
Phobic anxiety	0.0(0.3)	0.3(1.1)	899,500	0.007
Paranoid ideation	0.5(0.8)	0.8(1.1)	1 086,500	0.185
Psychoticism	0.3(0.6)	0.5(1)	1 041,000	0.100

Source: self-made

The comparison of the study variables according to the age ranges (Table 5) indicated a statistically significant difference in the stress management variable ($p=0.013$), presenting an increase in the score with increasing age.

Regarding the mental health variables, a statistically significant difference was presented in the interpersonal sensitivity variable ($p=0.034$), showing higher values in the younger age range. Likewise, a statistically significant difference was found in the symptoms of anxiety ($p=0.048$)

and phobic anxiety ($p=0.010$), indicating higher values in the age range between 40-60 years.

The comparison of study variables according to the educational level of the participants (Table 6) did not present a statistically significant difference in the lifestyle variables.

Regarding the mental health symptoms, it indicated a significant difference in the variable of somatizations ($p=0.011$), interpersonal sensitivity ($p=0.002$), depression ($p=0.045$),

Table 5. Comparison of study variables according to age

Variables	18-29 Median (IR)	30-40 Median (IR)	40-60 Median (IR)	Chi-Squared	p-value
Nutrition	2.9 (0.9)	3.2 (0.9)	3.0 (1.3)	0.88	0.644
Exercise	3 (1.2)	2.8(0.8)	2.2 (1.2)	2.84	0.275
responsibility in health	2.1 (0.8)	2.2(0.5)	2.3 0(0.9)	1.29	0.466
Stress management	2.3 (0.6)	2.6(0.6)	2.8 (0.7)	8.26	0.013
Interpersonal support	3.1 (0.7)	3.1(0.7)	3 (0.7)	0.519	0.771
Auto-update	3.4 (0.7)	3.2(1.1)	3.3 (0.7)	2.245	0.325
Somatizations	0.8 (0.8)	0.4(0.8)	0.6 (1.0)	3.873	0.144
Obsessions and compulsions	1.0 (1.1)	1.2 (1.1)	1.1 (0.6)	0.674	0.714
Interpersonal sensitivity	0.8 (1.1)	0.3 (0.8)	0.6 (0.5)	6.41	0.034
Depression	0.9 (1.1)	0.7 (0.8)	0.8 (1.0)	1.84	0.582
Anxiety	0.5 (0.8)	0.3 (0.6)	0.6 (0.8)	6.94	0.048
Hostility	0.5 (0.7)	0.3 (0.7)	0.5 (0.5)	4.593	0.101
Phobic anxiety	0.2(1.0)	0.1 (0.2)	0.3 (1.9)	9.303	0.010
Paranoid ideation	0.8 (1.3)	0.5 (0.7)	0.7 (0.7)	3.863	0.145
Psychoticism	0.5 (1.0)	0.3 (0.6)	0.3 (0.9)	2.130	0.345

Source: self-made

Table 6. Comparison of study variables according to educational level

Variables	Secondary Median (IR)	Technique/ technology Median (IR)	Undergraduate Median (IR)	Graduate Median (IR)	Chi-Squared	p-value
Nutrition	3.3(1.3)	2.7(1.0)	3(1.0)	3.2(1)	2.088	0.554
Exercise	2.8(1.2)	2.4(1.8)	3(1.1)	2.6(.8)	3.758	0.289
Responsibility in health	2(0.6)	2.4(0.6)	2.1(0.8)	2.3(0.5)	2.602	0.457
Stress management	2.3(0.4)	2.4(0.7)	2.4(0.6)	2.7(0.6)	6.075	0.108
Interpersonal support	2.9(0.4)	3.1(0.7)	3.2(0.9)	3.3(0.7)	3.614	0.306
Auto-update	3.2(0.7)	3.3(.7)	3.2(.7)	3.4(1)	0.502	0.918
Somatizations	0.3(1)	0.5(0.7)	0.8(0.7)	0.7(0.6)	11.075	0.011
Obsessions and compulsions	1(1.5)	1(1)	1.2(1.1)	1(1.4)	2.678	0.444
Interpersonal sensitivity	1(1.5)	1.8(1)	0.2(0.6)	0.4(0.6)	14.706	0.002
Depression	0.1(1.2)	0.4(1.2)	0.6(0.8)	0.4(1)	7.620	0.045
Anxiety	0.3(1.1)	0.4(0.6)	0.7(0.8)	0.6(0.5)	9.985	0.019
Hostility	0.5(1.3)	0.5(0.7)	0.5(0.7)	0.4(0.6)	6.239	0.101
Phobic anxiety	0.0(1.3)	0.0(0.3)	0.3(0.8)	0.3(0.1)	12.447	0.006
Paranoid ideation	1.3(1.2)	0.8(0.8)	0.5(1.0)	0.3(0.5)	11.973	0.007
Psychoticism	0.4(1.3)	0.6(0.9)	0.3(0.9)	0.2(0.5)	8.392	0.039

Source: self-made

anxiety ($p=0.019$), and phobic anxiety ($p=0.006$), showing higher values in the groups with a higher educational level.

In contrast, in the variable of paranoid ideation ($p=0.007$) and psychoticism ($p=0.039$), the

highest score was associated with the lowest educational level.

Regarding the comparison of study variables according to the marital status groups and the type of occupation of the participants, no statistically significant difference was identified, indicating

the absence of association of the variables studied with these sociodemographic characteristics.

Correlations between lifestyle variables and mental health symptoms

Table 7 presents the results of correlations found between lifestyle variables and mental health symptoms in the study sample.

Regarding the correlation between lifestyle variables and mental health symptoms, a medium, negative, and significant correlation was identified between exercise and somatizations ($r = -0.438/p = 0.024$), obsessions and compulsions ($r = -0.291/p = 0.044$) and anxiety ($r = -0.237/p = 0.017$). This indicates that the higher the level of exercise use, the lower the level of these symptoms.

Similarly, a negative, median, and significant correlation was identified between health responsibility and the variables of obsessions and compulsions ($r = -0.243/p = 0.014$), hostility ($r = -0.279/p = 0.042$), and ideation. paranoid ($r = -0.369/p = 0.006$), showing that a higher level of responsibility in health implies less manifestation in the above symptoms.

Stress management yielded medium, negative, and significant correlations with almost all symptom variables: obsessions and compulsions ($r = -0.326/p = 0.022$), interpersonal sensitivity ($r = -0.302/p = 0.002$), depression ($r = -0.436/p = 0.017$), hostility ($r = -0.319/p = 0.027$), phobic anxiety ($r = -0.428/p = 0.021$), paranoid ideation ($r = -0.484 / p = 0.004$) and psychoticism ($r = -0.223/p = 0.024$). This shows the importance of stress management for the reduction of previous symptoms.

The personal support variable also showed medium, negative, and significant correlations with several symptom variables such as obsessions and compulsions ($r = -0.274/p = 0.041$), interpersonal sensitivity ($r = -0.251/p = 0.011$), depression ($r = -0.470/p = 0.038$), anxiety ($r = 0.213/p = 0.032$), phobic anxiety ($r = -0.397/p = 0.047$), paranoid ideation ($r = -0.327/p = 0.001$) and psychoticism ($r = -0.299/p = 0.045$), indicating that the higher the level of personal support the study participants reported lower scores in the above symptoms.

And, finally, the self-actualization variable showed a negative, median, and significant

correlation with the variables of somatizations ($r = -0.577/p = 0.0001$), obsessions and compulsions ($r = -0.434/p = 0.001$), interpersonal sensitivity ($r = -0.340/p = 0.001$), depression ($r = 0.615/p = 0.0001$), anxiety ($r = -0.368/p = 0.0001$), hostility ($r = -0.288/p = 0.003$), phobic anxiety ($r = -0.391/p = 0.003$), paranoid ideation ($r = -0.313/p = 0.001$) and psychoticism ($r = -0.463/p = 0.0001$), showing, likewise, the importance of this lifestyle variable for the reduction of the above symptoms.

DISCUSSION

The results indicated that in the study sample, the presence of risk was not identified in any of the mental health symptoms assessed, considering that they were in the situation of the pandemic and a condition of social distancing due to the mandatory quarantine (16). However, even outside the risk range, higher scores can be observed in the variables of obsessions and compulsions, depression, anxiety, and somatizations, which could be precisely due to the situation of the pandemic and the presence of a real and permanent risk of contagion and even eventual death (17). In this aspect, the present study is consistent with the results indicated in other investigations (18).

The fact that the risk in mental health symptoms was not identified in the sample of the current study could be related to medium-high scores identified in the variables of self-actualization and interpersonal support as constitutive of the valued lifestyle construct, as well as good scores in the variables of exercise and stress management (19). Likewise, the variable of responsibility in health, being its score below the other variables, showed good scores, being at the average level (20).

The above variables related to lifestyle habits seem to have acted as protective factors for different aspects of mental health in the pandemic situation in the sample of the present study. In this regard, the results showed a negative and statistically significant correlation between self-actualization and somatizations, obsessions and compulsions, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism, showing that the higher the level of self-actualization, fewer

Table 7. Correlation between lifestyle variables and symptoms

Correlated variables	Rho Spearman	P
Exercise/somatizations	-0.438*	0.024
Exercise/obsessions and compulsions	-0.291*	0.044
exercise/anxiety	-0.237*	0.017
Health responsibility/obsessions and compulsions	-0.243*	0.014
Health liability/hostility	-0.279*	0.042
Health responsibility/paranoid ideation	-0.369*	0.006
Stress management/obsessions and compulsions	-0.326*	0.022
Stress management/interpersonal sensitivity	-0.302**	0.002
Stress/depression management	-0.436*	0.017
Stress/hostility management	-0.319*	0.027
Managing stress/phobic anxiety	-0.428*	0.021
Stress management/ paranoid ideation	-0.484**	0.004
Stress management/psychoticism	-0.223*	0.024
Interpersonal Support/Obsessions and Compulsions	-0.274*	0.041
Interpersonal support/interpersonal sensitivity	-0.251*	0.011
Interpersonal support/depression	-0.470*	0.038
Interpersonal support/anxiety	-0.213*	0.032
interpersonal support/ phobic anxiety	-0.397*	0.047
Interpersonal support/paranoid ideation	-0.327**	0.001
Interpersonal support/psychoticism	-0.299*	0.045
Self-updating/somatizations	-0.577**	0.000
Self-actualization/obsessions and compulsions	-0.434**	0.001
Self-actualization/interpersonal sensitivity	-0.340**	0.0001
Self-update/ depression	-0.615**	0.0001
self-actualization/anxiety	-0.368**	0.0001
Self-update/ hostility	-0.288**	0.003
Self-actualization/phobic anxiety	-0.391**	0.003
Self-update/ paranoid ideation	-0.313**	0.001
self-actualization/psychoticism	-0.463**	0.0001

**Correlation is significant at the 0.01 level (bilateral)

*Correlation is significant at the 0.05 level (bilateral)

mental health symptoms were observed almost in all the variables evaluated (21).

It is important to highlight that the self-actualization variable estimates the existential commitment to one's own life, optimism regarding their abilities and capacities for self-realization, and orientation toward the search for deep meanings in their own life (22). In this regard, studies at a general level indicate that personological aspects such as spirituality, a tendency towards personal growth, self-actualization, and self-actualization are associated with a higher level of psychological well-being and better mental health in people (23).

Regarding the studies carried out during the pandemic, other authors also indicate that spirituality and a lifestyle oriented towards altruism and transcendence acted as predictors of better mental health during the adverse situation of the COVID-19 pandemic (24).

Another of the variables that presented an inverse relationship with the mental health symptomatology assessed was the variable of interpersonal support (25). In this regard, the results of this study confirm the findings of other studies that affirm a positive effect of interpersonal support, emotional support, and the possibility of sharing emotions and concerns

with their support networks on people's mental health (26).

Likewise, the factor of interpersonal support networks was decisive in the process of coping with the COVID-19 pandemic, indicating that loneliness was a risk factor for suffering depression-anxiety comorbidity due to the outbreak of coronavirus (27).

It is also important to highlight that the stress management variable as part of the lifestyle construct showed an inversely proportional relationship to mental health symptoms such as obsessions and compulsions, interpersonal sensitivity, depression, hostility, phobic anxiety, paranoid ideation, and psychoticism during the time of the pandemic in the study sample (28). As in the previous variables, this data is in line with other studies that indicate the importance of having emotion management skills and coping strategies that reduce the stress caused by adverse and potentially dangerous situations such as the COVID-19 pandemic (29).

Likewise, a negative and significant correlation was identified between health responsibility as a habit and vital attitude and the variables of obsessions and compulsions, hostility, and paranoid ideation, showing that a higher level of health responsibility implies less manifestation in the above symptoms. This shows, that self-care and adherence to the protection routines required during the pandemic allowed the people in the sample to reduce their levels of anxiety and fear in the face of possible contagion (30).

And finally, the habit of physical exercise also showed a positive contribution to the reduction of somatizations, obsessions and compulsions, and anxiety during the pandemic in the participants of this study. Along the same lines, the study's (31) indicated that greater physical activity during quarantine isolation is related to better mental health, being associated with less anxiety, depression, stress, and insomnia and greater perceived well-being (32).

Regarding the sociodemographic variables, a statistically significant difference was observed in the gender variable related to various aspects of both lifestyles and mental health symptoms.

In this aspect, women presented higher scores in nutrition, health responsibility, and interpersonal support (33). These results could be related, first of all, to the general trend that is attributed to the female gender of being more careful with food and paying more attention to the symptoms of physical and emotional discomfort as well as having a greater tendency towards the construction of social networks of psychological and emotional support (34). And in second place, this could also be related to the fact that the women in the sample also presented higher scores in somatizations, obsessions and compulsions, interpersonal sensitivity, depression, anxiety, and phobic anxiety (35). The higher level of awareness, as well as the concern not only for themselves but also for their families, could have influenced a greater manifestation of mental health problems in the women in the study sample. Studies also indicate that the female gender showed higher rates of depression, anxiety, and psychological and physical discomfort at a general level during the COVID-19 pandemic (36).

Regarding the age variable, the best stress management was presented as age increased, showing that older people spent more time relaxing, sleeping routines, and taking care of themselves during the pandemic (37). Notwithstanding the foregoing, an increase in anxiety was observed in older people, reaching higher scores in the age range between 40 and 60 years, which could be related to the greater danger that the virus represented for older people, these data being similar to other studies that indicate the presence of greater mental health difficulties in adults and older adults during the COVID-19 pandemic (38).

Regarding the educational level of the participants, an increase in some mental health symptoms such as somatizations, interpersonal sensitivity, depression, anxiety, and phobic anxiety was observed in people with a higher educational level, with findings that are consistent with other studies considering that a higher educational level could probably be related to a higher level of awareness about the real situation and the respective degree of awareness about the threat represented by the pandemic (39).

CONCLUSIONS

At a general level, it is observed in the results of this study that better life habits related to self-actualization, interpersonal support, stress management, responsibility in health, and exercise during the pandemic and in quarantine, situations were related to fewer negative health mental symptoms.

One of the most relevant contributions consists of the finding of a positive contribution that showed the aspect of spirituality and personal updating, adding to the search for meaning in life and personal transcendence to mental health in the study sample during the pandemic COVID-19. The foregoing makes it possible to reinforce the line of studies in the field of positive psychology, addressing mental health as a self-actualizing tendency based on the empowerment of human capacities, both in normal living conditions and in unusual and threatening situations such as an example of the recent COVID -19 pandemic (40-44).

Another relevant contribution is the importance of considering the differential gender approach in the analysis of the behavior of human beings in emergencies, due to the difference in the way of interpreting and considering the vital values and priorities of both genders. It is necessary to continue deepening the study of these differential aspects, to manage health care and intervention strategies with a gender approach in this type of situation that threatens the mental health of people, such as the COVID-19 pandemic (19).

REFERENCES

- Martin AR, Daly MJ, Robinson EB, Hyman SE, Neale BM. Predicting Polygenic Risk of Psychiatric Disorders. *Biol Psychiatry*. 2019;86(2):97-109.
- Organización Mundial de la Salud. Alimentación sana y estilos de vida saludables. 2018;2025(8):1-10.
- De La Guardia Gutiérrez MA, Ruvalcaba Ledezma JC. La salud y sus determinantes, promoción de la salud y educación sanitaria. *J Negative and No Positive Results*. 2020;5(1):81-90.
- Calpa A, Santacruz G, Alvarez M, Zambrano C, Hernández E, Matabanchoy S. Promoting healthy lifestyles: strategies and scenarios. *Hacia Promoc Salud*. 2019;24(2):139-155.
- Laban-Sharman A, Majumdar A. Self-Care practices for anxiety during the COVID-19 pandemic in the UK in adults. *Mental Health: Global Challenges J*. 2021;4(1).
- Rakhimova O, Hojiyevna T, Rustamovna K. The Role of Human Healthy and Safe Lifestyle In The Period Of Global Pandemic-COVID 19. *Am J Appl Sci*. 2020;02(11):78-81.
- Ma Y, Li W, Deng H, Wang L, Wang Y, Wang P. Prevalence of depression and its association with quality of life in clinically stable patients with COVID-19. *J Affect Disord J*. 2020;1:145-148.
- Rico-Gallegos C, Vargas-Esparza G, Poblete-Valderrama F, Carrillo-Sanchez J, Rico-Gallegos J, Mena-Quintana B, et al. Physical activity habits and health status during the pandemic by COVID-19. *J Espac*. 2020;41(42):1-10.
- Pérez M, Álvarez N, Rodríguez A. Psychological and social repercussion of COVID-19 pandemic. *Electron J Medimay*. 2020;27(2):252-261.
- Huarcaya-Victoria J. Mental health considerations in the COVID-19. *Rev Peru Med Exp Salud Publica*. 2020;37(2):327-334.
- Losada-Baltar A, Márquez-González M, Jiménez-Gonzalo L. Differences by age and self-perception of aging in anxiety, sadness, loneliness and anxiety, sadness, loneliness, and comorbid anxious-depressive symptomatology during depressive symptomatology during confinement by the COVID-19. *Spanish J Geriatr Gerontol*. 2020;55(5):272-278.
- Moriarty T, Bourbeau K, Fontana F, Mcnamara S. The Relationship between Psychological Stress and Healthy Lifestyle Behaviors during COVID-19 among Students in a US Midwest University. *Int J Environ Res Public Health*. 2021;18:18-28.
- Jasper C, Mikhael R. An analysis on the panic during the COVID-19 pandemic through an online form. *J Affect Disord J*. 2020;276:14-22.
- Fullana MA, Hidalgo-Mazzei H, Vieta E, Radua J. Coping behaviors associated with decreased anxiety and depressive symptoms during the COVID-19 pandemic and lockdown. *J Affective Disorders*. 2020;275:80-81.
- Casullo M, Pérez M. The inventory of derogatys syntomas SCL90Derogatis. *Uba Cocinet*. 2008:1-12.
- Park K, Kim A, Yang M, Lim S, Id JP. Impact of the COVID-19 Pandemic on the lifestyle, mental health, and quality of life of adults in South Korea. *PLoS One*. 2021;16(2):1-13.

17. Moreira PS, Ferreira S, Couto B, Machado-Sousa M, Fern M, Raposo-lima C, et al. Protective Elements of Mental Health Status during the COVID-19 Outbreak in the Portuguese Population. *Int J Environ Res Public Health*. 2021;18(4):1910.
18. Fisher A, Roberts A, Mckinlay AR, Fancourt D, Burton A. The impact of the COVID-19 pandemic on mental health and well-being of people living with a long-term physical health condition: A qualitative study. *BMC Public Health*. 2021;21(1801):1-12.
19. Das R, Hasan R, Daria S, Islam R. Impact of COVID-19 pandemic on mental health among general Bangladeshi population: A cross-sectional study. *BMJ Open*. 2021;11:e045727.
20. Blom V, Lönn A, Ekblom B, Kallings L V, Väisänen D, Hemmingsson E, et al. Lifestyle Habits and Mental Health in Light of the Two COVID-19 Pandemic Waves in Sweden, 2020. *Int J environmental Res Public Heal*. 2021;18:1-19.
21. Giuntella O, Hyde K, Saccardo S, Sadoff S. Lifestyle and mental health disruptions during. *Proceedings of the National Academy of Sciences (PNAS)*. 2021;118(9) e2016632118.
22. Tovani-Palone MR, Comini N, Giacalone A, Franchi T. Importance of Healthy Habits During the COVID-19 Pandemic: Perspective and Suggestions. *Electron J Gen Med*. 2022;19(3):em369.
23. Azzouzi S, Stratton C, Muñoz-Velasco LP, Wang K, Fourtassi M, Hong B, et al. The Impact of the COVID-19 Pandemic on Healthy Lifestyle Behaviors and Perceived Mental and Physical Health of People Living with Non-Communicable Diseases: An International Cross-Sectional Survey. *Int J Environ Res Public Health*. 2022;19:8023.
24. Balanzá-Martínez V, Kapczinski F, de Azevedo Cardoso T, Atienza-Carbonell B, Rosa AR, Mota JC, et al. The assessment of lifestyle changes during the COVID-19 pandemic using a multidimensional scale. *Rev Psiquiatr Salud Ment (Engl Ed)*. 2021;14(1):16-26.
25. Hampshire A, Hellyer PJ, Soreq E, Mehta MA, Ioannidis K, Trender W, Grant JE, Chamberlain SR. Associations between dimensions of behaviour, personality traits, and mental health during the COVID-19 pandemic in the United Kingdom. *Nat Commun*. 2021;12(1):4111.
26. Moreno C, Wykes T, Galderisi S, Nordentoft M, Crossley N, Jones N, et al. How mental health care should change as a consequence of the COVID-19 pandemic. *Lancet Psychiatry*. 2020;7(9):813-824.
27. Petzold MB, Bendau A, Plag J, Pyrkosch L, Mascarell Maricic L, Betzler F, et al. Risk, resilience, psychological distress, and anxiety at the beginning of the COVID-19 pandemic in Germany. *Brain Behav*. 2020;10(9) e01745.
28. Gloster AT, Lamniso D, Lubenko J, Presti G, Squatrito V, Constantinou M, et al. Impact of COVID-19 pandemic on mental health: An international study. *PLoS One*. 2020;15(12): e0244809.
29. Kim S, Su K. Brain, Behavior, and Immunity Using psychoneuroimmunity against COVID-19. *Brain Behav Immun*. 2020;87(2):4-5.
30. Mukhtar S. Psychological health during the coronavirus disease 2019 pandemic outbreak. *Int J Soc Psychiatry*. 2020;66(5):512-516.
31. Kassaeva P, Belova E, Shashina E, Shcherbakov D, Makarova V, Ershov B, et al. Anxiety, Depression, and Other Emotional Disorders during the COVID-19 Pandemic: A Narrative Review of the Risk Factors and Risk Groups. *Encycl*. 2022;2:912-927.
32. Sheridan L, Sonia R, Barnett P, Steare T, Needle JJ, Carr S, et al. Early impacts of the COVID-19 pandemic on mental health care and people with mental health conditions: Framework synthesis of international experiences and responses. *Soc Psychiatry Psychiatr Epidemiol*. 2021;56(1):13-24.
33. Douglas M, Katikireddi SV, Taulbut M, Mckee M, McCartney G. Mitigating the wider health effects of COVID-19 pandemic. *BMJ Glob Heal*. 2020;1557:1-6.
34. Li M, Wang Q, Shen J. The Impact of Physical Activity on Mental Health during COVID-19 Pandemic in China: A Systematic Review. *Int J Environ Res Public Health*. 2022;19(11):6584.
35. Hyland P, Shevlin M, McBride O, Murphy J, Karatzias T, Bentall RP, et al. Anxiety and depression in the Republic of Ireland during the COVID-19 pandemic. *Acta Psychiatr Scand*. 2020;142(3):249-256.
36. Bingham KS, Rozenbojm N, Chong-East M, Touma Z. Exploring the Mental Health Needs of Persons with Autoimmune Diseases During the Coronavirus Disease 2019 Pandemic: A Proposed Framework for Future Research and Clinical Care. *ACR Open Rheumatol*. 2021;3(1):25-33.
37. Clemente-Suárez VJ, Martínez-González MB, Benitez-Agudelo JC, Navarro-Jiménez E, Beltran-Velasco AI, Ruisoto P, et al. The Impact of the COVID-19 Pandemic on Mental Disorders. A Critical Review. *Int J Environ Res Public Health*. 2021;18(19):10041.
38. Young KP, Kolcz DL, O'Sullivan DM, Ferrand J, Fried J, Robinson K. Health Care Workers' Mental Health and Quality of Life During COVID-19: Results from a Mid-Pandemic, National Survey. *Psychiatr Serv*. 2021;72(2):122-128.
39. Salari N, Hosseini-Far A, Jalali R, Vaisi-Raygani A, Rasoulpoor S, Mohammadi M, et al. Prevalence of stress, anxiety, depression among the general population during the COVID-19 pandemic: A systematic review and meta-analysis. *Global Health*. 2020;16(1):57.

40. Varma P, Junge M, Meaklim H, Jackson ML. Progress in Neuropsychopharmacology & Biological Psychiatry Younger people are more vulnerable to stress, anxiety, and depression during the COVID-19 pandemic: A global cross-sectional survey. *Prog Neuropsychopharmacol Biol Psychiatry*. 2021;109:110236.
41. Cudris-Torres DL, Olivella-López G, Cuenca-Calderón SE, Barrios- Núñez Álvaro, Bonilla-Cruz NJ, Bustos-Arcón V, et al. Financial management and satisfaction with life in Colombians during confinement by COVID-19. *Gac Méd Caracas*. 2020;128(2S):S312-S319.
42. Cudris-Torres L, Barrios-Núñez Álvaro, Bonilla-Cruz NJ. Coronavirus: epidemia emocional y social. *Arch Ven Farmacol Ter*. 2020;39(3):309-312.
43. Bonilla-Cruz DN-J, Cudris-Torres L, Mendoza-Rincón B-M, Gamboa-Aldana A-S, Forgiony-Santos J. Health Strategies in Latin America for the Elderly in relation to COVID-19. *Gac Méd Caracas*. 2020;128(2S):S301-S311.
44. Olivella-López G, Silvera-Torres L, Cudris-Torres L, Bahamón MJ, Medina Pulido PL. Calidad de vida en jóvenes universitarios. *Arch Ven Farmacol Ter*. 2020;39(3):391-395.

Reading comprehension and academic performance, an analysis in primary basic education students from Yopal – Casanare

Comprensión lectora y rendimiento académico, un análisis en estudiantes de educación básica primaria de Yopal – Casanare

Helena Báez Infante¹

SUMMARY

Reading comprehension is a process through which the student shows his ability to analyze, interpret and argue about a topic that he has read and allows him to respond in fields of knowledge and solve problems. This study aimed to relate the evaluation of reading comprehension with the academic performance of primary school students from Yopal Casanare. A quantitative study was carried out, with a non-experimental design, of correlational scope and moment of a cross-sectional study. We worked with 190 fifth-grade students to whom the PROLEC - R test was applied, and the academic performance was obtained from the results of the Competent Reader entrance test. For the data analysis, the statistical package SPSS V24 was used, which allowed the establishment of the use of frequencies, percentages, and measures of central

tendency and variabilities such as the mean, standard deviation, skewness, and kurtosis. Following this, cross tables were used to achieve detailed descriptions of frequency in contrast to other variables and with it the chi-square test. Finally, the Pearson correlation statistic was applied to establish associations between variables. The results show a significant correlation between reading comprehension and satisfactory academic performance in the studied sample. It is concluded that students who have reading habits present better academic performance.

Keywords: *Reading comprehension, academic performance, competent reader, correlation, scores.*

RESUMEN

La comprensión lectora es un proceso mediante el cual el estudiante muestra su habilidad para analizar, interpretar y argumentar sobre un tema que ha leído y le permita responder en campos de conocimiento y resolver problemas. El objetivo consistió en

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relacionar la evaluación de la comprensión lectora con el rendimiento académico de estudiantes de básica primaria de Yopal Casanare. Se llevó a cabo un estudio cuantitativo, con diseño no experimental, de alcance correlacional y momento de estudio transversal. Se trabajó con 190 estudiantes del quinto grado a los que se les aplicó la prueba PROLEC – R y el rendimiento académico se obtuvo de los resultados de la prueba de entrada Lector Competente. Para el análisis de datos se utilizó el paquete estadístico SPSS V24, que permitió establecer uso de frecuencias, porcentajes y medidas de tendencia central y variabilidad como la media, desviación estándar, asimetría y curtosis. Seguido a esto se procedió al uso de tablas cruzadas para lograr descripciones detalladas de frecuencia en contraste con otras variables y con ello la prueba de chi cuadrado. Finalmente, se aplicó el estadístico de correlación de Pearson para establecer asociaciones entre variables. Los resultados muestran una correlación significativa entre la comprensión lectora y el rendimiento académico satisfactorio en la muestra estudiada. Se concluye que los estudiantes que tienen hábitos de lectura presentan un mejor desempeño académico.

Palabras clave: *Comprensión lectora, rendimiento académico, lector competente, correlación, puntuaciones.*

INTRODUCTION

In the international context, the specific case related to the reading process and the existing relationships with academic performance are described through test results and international reports on education and issues that affect it, according to the United Nations Organization (1), the results show minimum levels of reading comprehension. In Latin America, it is contrasted with educational policies, culture, technology, economy, ecology, and the contextualization of education according to each country or region that presents a low academic performance in standardized tests. Knowing the significant aspects of the academic performance of students from the reality of the classroom shows the problem in a general way and through a review of research related to reading, reading comprehension, and academic performance, this problem is contextualized (2).

There is research that relates reading comprehension and academic performance as

necessary variables for analysis from different contexts. Reading is not only the reproduction or repetition of written communication. Reading is a communication process between the writer of the text and the reader of the text. Reading makes it possible to discover different ways of learning. The writer encodes the message to be transmitted to the reader and the latter decodes when reading it. Therefore, factors intervene in the brain from the cognitive aspects of the one who writes and the one who reads. Through graphic signs, the writer makes his message known, in addition to printing a communicative intention, these intentions develop when the linguistic ability to read is developed (3-7).

Reading comprehension affects academic performance, indicating that the student at school has the support of the teacher to clarify doubts and deepen their reading comprehension, while at home they may suffer from low reading comprehension by not finding the precise guidelines (8). The investigation was carried out to determine how reading comprehension influences the school performance of seventh-grade students, for which we proceeded to verify the problem raised through the operationalization of variables, using as a research source an article on academic performance that supports the purposes and representations of academic performance (9,10).

The problems of reading comprehension and academic performance occur at different ages and times of study. In Peru there is an investigation in which an analysis of the problem of reading for comprehension was developed, that is, to read thinking as the author indicates. The results indicate the lack of mastery of the dimensions of scrutiny appreciation that favors understanding and constructing new meanings, classifying, analyzing and inferring cognitive processes and capacities that are consistent with reading comprehension. The research with a quantitative methodology used a system for the exploration perception variable. A survey was carried out on 95 students of the cycle I and for the academic execution narrative research was used as a procedure. An exam was carried out that statistically deciphered how there was a connection between reading comprehension and academic performance (11).

In Peru, they also developed a quantitative, descriptive study in which they found that only 26 % of the students acquired the importance of strategies such as drawings, graphs, mental images, or questions for the comprehension of a text. Regarding a confrontation on strategies used by the teacher, it was possible to identify that only 20 % of the teachers provide orientation to the students on the importance of the use of learning strategies, such as drawings, graphs, and questions that strengthen reading comprehension and that they allowed students to retrieve information through the reading exercise (12).

In Guatemala delved into reading comprehension as a competence, part of a communication process between the reader and the text. This means that the reader achieves an internal communication process: he wonders, analyzes, criticizes, reflects, and achieves confidence in his school expectations. Within the experimental proposal, the researcher proposed strategies to improve reading comprehension and plan activities. For example, the use of comparisons, where he proposed as an action to ask the questions to easily find the similarities, differences, and how they were related to each other to predict the reading comprehension abilities of the students according to reading ability and internal communication process (13).

It is necessary to know the difficulties that students present with regard to their reading comprehension at school to relate aspects of their academic performance, and attention processes to the development of instructional activities and understand the concepts derived from the study on reading, reading comprehension, and of the strategies that are implemented through different investigations, the analysis of the data is an example. In addition, the attention to the contextualization of the institutional problem is of great importance because the social, cultural function is also favoured, not only as a need for to study the problems in the school environment that affect student learning, it is also necessary to intervene in the factors associated with a deficient reading comprehension ability (14-16).

The problem of reading comprehension associated with academic performance is also present in the city of Yopal and in the Educational Institution where the study was developed:

Colegio Luis Hernández Vargas, an institution in which it was required to apply a test that would allow finding aspects of identification specific to reading comprehension and finding the existing correlations between reading comprehension and academic performance through an external test. In the research process, the results of the entrance test were used, carried out by the Merani Foundation, and the application of instruments to evaluate the levels of reading comprehension PROLEC - R.

METHOD

In the present study, a non-experimental design was used, with a quantitative approach, correlational type, and cross-section, the population refers to the total number of students enrolled in the Luis Hernández Vargas school in fifth grade, which corresponds to 280 students, the sample consisted of 190 fifth grade students (Table 1).

Table 1. Sample

Campus	Students	Sample
Camilo Torres		
Headquarters	14	7
Headquarters	100	55
Headquarters Salvador		
Camacho Roldán	65	50
Headquarters Marco		
Fidel Suárez	101	78

Source: self-made

Collection instrument

For the collection of data corresponding to reading comprehension, the revised version of the PROLEC-R test was used with its battery of evaluation of reading processes - revised. The corresponding questions were asked in the processes to the identification of letters, lexical processes, grammatical processes, and semantic processes (17).

The psychometric instrument of the Revised Reading Process Assessment Battery (PROLEC-R) is an instrument that was adapted from a Peruvian Center for Hearing, Language, and Learning, in Lima, Peru, where it was applied to 504 students belonging to 14 Educational Institutions, obtaining as a result that the PROLEC-R scores are reliable, calculated through the internal consistency method (Cronbach's alpha). Likewise, it evidences the validity of the content (expert judgment), criterion (concurrent validity), and construct (confirmatory factor analysis) (17).

Instrument reliability

The PROLEC – R instrument presents consistent results, which facilitates the functions of the instrument and allows taking results according to the battery of questions applied and the results are consistent. Reliability is established with internal consistency and reporting functions. Overall Cronbach's alpha: 0.7. Process information functions in letter identification, syntactic and semantic processes (17).

Procedure

The project was socialized to managers, teachers, parents, and students of the Luis Hernández Vargas school in a virtual way using the Zoom Platform, once the institutional permission was obtained, the parent signed the informed consent and the assent by the fifth-grade students through a Google form and the application schedule was organized.

On the scheduled day, the PROLEC-R Reading Process Assessment Battery was applied, through the online questionnaire, ensuring the information with the respective responses of each student. And recording the corresponding scores using a stopwatch used by the researcher to take the times and take them to the speed indices on the answer sheet. The information was completed by performing each of the nine tasks. The open questions were answered by the student individually and recorded in the online form.

The procedure for collecting information virtually was developed over four months with 90 students who were scheduled online. The test took a maximum of 30 minutes, but time was given for questions related to informed consent and assent, sociodemographic aspects, and academic background. The process continued in person under resolution 777 of June 2, 2021, for the return to face-to-face, the groups began alternately, which facilitated the scheduling process. Having the corresponding permits for face-to-face classes, the process continued to be carried out in person, for which, in the same way as with the virtual group, we proceeded with the telephone call to contextualize the parents and guardians and obtain the corresponding permissions to send the informed consent via WhatsApp, which is the communication mechanism used by parents and guardians.

It was a requisite to receive first the signed consent and then proceed to schedule according to the class schedule, group, and location. Then the communication was generated with the grade director for the visit to the corresponding headquarters and corresponding grade. Then it was applied the instrument to the students who had informed consent. In this exercise, the directives: rector, coordinators, and students were attentive to collaborate and participate according to the indications and it was possible to complete the face-to-face process with one hundred students, the application of the instrument and the sociodemographic information was carried out, academic records were recorded with a telephone call. The physical test was carried out in a suitable place for the process where only the student and the researcher were to guide the process of applying the instrument, take the corresponding measurements and the student answered the questions that required open answers, developed it on the sheet of instrument responses.

The process was developed for approximately two months in person. The time allocated for data collection took a total of seven months, as it is a highly complex questionnaire with an evaluation of nine tasks for reading processes. Data was obtained from a total of 190 participants for seven

months, five virtual months, and two face-to-face. After obtaining the data, the information was organized in an Excel table with nominal values to continue the process of data analysis.

Data Analysis

The analysis of results was carried out initially using a data matrix in Excel that was later transferred to SPSS V24. Subsequently, the descriptive analysis was carried out using frequencies, percentages, and measures of central tendency and variability such as the mean, standard deviation, skewness, and kurtosis. Cross tables were used to achieve detailed descriptions of frequency in contrast to other variables and with it the Chi-Square test. Pearson correlation statistic was applied to determine the level and direction of the associations between the variables.

Ethical considerations

The certification process for working with humans in the development of research was carried out, with the signing of the consent and the informed assent. It was a communication process between professionals and participants, where the parents' indicated approval of the informed consent for the participation of their sons and daughters because they were minors and in the same way the students generated the assent of wanting to participate voluntarily without any compensation, by the process and carrying out the respective intervention, the choice to participate is allowed and no type of discrimination is generated (18).

RESULTS

The study participants were between the ages of 9 and 10 with $M=9.28$ and $DE=0.45$, an issue that denotes homogeneity with respect to this variable. Regarding the gender variable, a very similar representation of both men and women was found, with 51.1 % being women and 48.9 % being women.

In relation to the academic characteristics of the students, the most relevant aspects were identified through survey-type questions in which

it was identified that 91.1 % have not failed school years, in contrast to the 8.9 % who reported having failed a year. They inquired about the existence or not of a reading routine that included even the vacation period, to which only 12.1 % answered yes and 56.8 % said yes sometimes. Regarding the development of processes related to competent readers, most of them (84.2 %) stated that they had been part of these. Finally, regarding the use of language material, the data shows that 51.6 % answered affirmatively (Table 2).

Table 2. Academic characteristics of the participants

		Frequency	Percentage
Has failed a year	Yes	17	8.9
	No	173	91.1
	Total	190	100.0
Reading routine including holidays	No	59	31.1
	Sometimes	108	56.8
	Yes	23	12.1
	Total	190	100.0
Development of processes related to competent readers	Yes	160	84.2
	No	30	15.8
	Total	190	100.0
Use of language material	Yes	98	51.6
	No	92	48.4
	Total	190	100.0

Source: self-made.

The performance levels regarding the reading routine in the participants were analyzed, from which it was identified that all the participants who were located in advanced levels in reading performance, reported having a reading routine including the vacation season. Meanwhile, the participants who reported not having a reading routine were located at a satisfactory level of reading performance. And the participants who reported a reading routine sometimes obtained mostly satisfactory and minimum levels of performance (Table 3).

Table 3. Crosstab reading routine* Performance level

		Performance level			Total
		Minimum	Satisfying	Advanced	
Reading routine including holidays	No	9	50	0	59
	Sometimes	43	65	0	108
	Yes	5	6	12	23
Total		57	121	12	190

Source: self-made.

The Chi-Square test for the reading routine and the reading performance test showed that there is perfect agreement between the expected

frequencies and the observed frequencies (Table 4).

Table 4. Chi-Square test Reading routine/Competent reader test

	Worth	df	Asymptotic (bilateral) Significance
Pearson Chi-Square	104.820	4	0.0001
Likelihood ratio	70.139	4	0.0001
Linear-by-linear association	2.407	1	0.121

Source: self-made.

The frequency of responses of the participants was analyzed relating the level of reading performance with the use of language matter, from which it was evidenced that the data were

not conclusive because the distribution was quite similar, however, it was identified that the children who were located at a satisfactory level mostly reported use of the language material (Table 5).

Table 5. Crosstab Material Use*Performance Level

		Performance level			Total
		Minimum	Satisfying	Advanced	
Use of material language	Yes	26	66	6	98
	No	31	55	6	92

Source: self-made.

The Chi-Square test for the use of language material and the reading performance test showed that there is perfect agreement between

the expected frequencies and the observed frequencies (Table 6).

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Table 6. Chi-Square test using material/Competent reader test.

Worth	df	Asymptotic (bilateral)	Significance
Pearson Chi-Square	1.250 ^a	2	0.535
Likelihood ratio	1.251	2	0.535
Linear-by-linear association	0.704	1	0,402

Source: self-made.

To establish the relationships between reading performance and the factors corresponding to students' reading comprehension, their scores were initially analyzed with the sociodemographic and academic characteristics evaluated, from which significant negative relationships were identified, although low with age ($r=-0.188^{**}$

$r=-0.194^{**}$), likewise, low correlations with socioeconomic status ($r=0.226^{**}$ $r=-0.263^{**}$). On the other hand, high positive significant correlations were identified between the years studied at the institution and the results of the proficient reader test and the level of performance (Table 7).

Table 7. Correlations between participant characteristics and reading performance.

		Age	Socioeconomic	Years studied at the institution
Proficient Reader test	Pearson correlation	-0.188 ^{**}	0.226 ^{**}	0.654 ^{**}
	Sig. (bilateral)	0.009	0.002	0.0001
Performance level	Pearson correlation	-0.194 ^{**}	0.263 ^{**}	0.633 ^{**}
	Sig. (bilateral)	0.007	0.0001	0.0001

Grades: *. The correlation is significant at the 0.05 level (bilateral).

**The correlation is significant at the 0.01 level (bilateral).

Source: self-made.

After the previous analysis, the existing relationships between the reading comprehension evaluated through the PROLEC - R and the academic performance evaluated through the external evaluation test of competent reader were established, identifying highly significant correlations between the total score and the level of performance and the letter identification, lexical processes and punctuation marks located between 0.737^{**} and 0.915^{**} ($p=0.0001$). Although significant statistical correlations were also identified between reading comprehension and semantic processes, which were located between 0.298^{**} and 0.360^{**} ($p=0.0001$) (Table 8).

To complement the correlation analysis between the variables, the relationships between the precision indices were analyzed before which significant values were located between reading performance and word identification that ranged between 0.514^{**} and 0.973^{**} (Table 9).

Correlations between reading performance or performance and reading comprehension speed indices were also analyzed, identifying high negative significant correlations between word identification, and punctuation marks whose associations varied between -0.705^{**} and -0.941^{**} ($p= 0.0001$) (Table 10).

Table 8. Correlations between main PROLEC-R indices and reading performance

		Ip letter name	Same-different ip	Ip word reading	Ip read pseudo words	Ip grammatical structures	Ip punctuation marks	Ip sentence comprehension	Ip text comprehension	Ip listening comprehension
Proficient reader test	Pearson	0.889**	0.935**	0.911**	0.954**	0.753**	0.961**	0.333**	0.320**	0.298**
	Sig. (bil.)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Performance level	Pearson	0.915**	0.804**	0.748**	0.808**	0.737**	0.891**	0.355**	0.360**	0.320**
	Sig. (bil.)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Grades: *. The correlation is significant at the 0.05 level (bilateral).

** . The correlation is significant at the 0.01 level (bilateral). IP=Main Index

Source: self-made.

Table 9. Correlations between PROLEC-R accuracy indices and reading performance

		IPR Name of Letters	IPR same-different	IPR word reading	IPR pseudoword reading	IPR punctuation marks
Proficient reader test	Pearson correlation	0.584**	0.751**	0.944**	0.973**	0.948**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001
Performance level	Pearson correlation	0.514**	0.632**	0.799**	0.841**	0.834**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001

*. The correlation is significant at the 0.05 level (bilateral).

** . The correlation is significant at the 0.01 level (bilateral). IV= Precision Index

Source: own elaboration.

Table 10. Correlations between PROLEC-R speed indices and reading performance

		IV name of letters	Same-different IV	IV reading of words	IV pseudoword reading	IV punctuation marks
Proficient reader test	Pearson correlation	-0.865**	-0.941**	-0.870**	-0.968**	-0.897**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001
Performance level	Pearson correlation	-0.859**	-0.841**	-0.705**	-0.836**	-0.892**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001

Grades: *. The correlation is significant at the 0.05 level (bilateral).

**The correlation is significant at the 0.01 level (bilateral). IV= Speed index

Source: self-made.

In conclusion, it should be noted that from the results found, significant correlations were identified between reading comprehension and academic performance, supporting the working hypothesis.

DISCUSSION

Evidence indicate a strong relationship between reading comprehension and academic performance, for example, some findings (3) describe the importance of reading comprehension from grammatical, semantic, syntactic, the necessary correspondences between sounds, codes, and production, without forgetting the reader's position in front of the text so that it generates an understanding and can perform academically.

In the same way, in Peru it was schematized the reader's position among the three aspects: the reader, text, and context, then demonstrate in their theory that the relationship between the efficient reader and the results obtained academically is part of their reading skills (11,12,19). The theoretical assumptions delve into the two variables generates a consensus in understanding reading comprehension as a cognitive process developed between the reader, the text, and the context explicitly and implicitly to build ideas about their meanings and generate understanding (20).

Several authors have examined the effects of reading comprehension and academic performance (3,11,20). By identifying the contributions related to the ability to read and comprehend, analysis skills, inferences, and comparing the results of this research that proposed finding the relationships between reading comprehension and performance, it can be contrasted with other research that has made it possible to show that reading comprehension problems and academic performance are presented at different ages and times of development. This research is related to analyzing the same variables reading comprehension and academic performance, the research is focused from the abilities to understand and construct new meanings, classify, analyze and infer cognitive processes and abilities that make

reading comprehension possible, a student can continue presenting the same problems of lack of understanding and impact on academic performance, if strategies are not intervened (11).

The literature review, the empirical studies and the theoretical foundations that support the two study variables, some of the research in these fields of knowledge of these two variables is evident. The contributions of other investigations conclude that reading comprehension affects academic performance (8), some delve into reading comprehension from inference processes and strategies to strengthen reading comprehension (21).

Regarding the Chi-Square test for the reading routine and the reading performance test, it was evidenced that there is perfect agreement between the expected frequencies and the observed frequencies, studies related to the evaluation of reading comprehension from the formulation of self-questions are evident, where the student's ability to self-regulate and activate their prior knowledge stands out in this research. The contribution of this research is highlighted in a comparative point in those students who have routines, habits, and strategies that can be used for the benefit of their reading comprehension and academic performance, in addition, they establish processes from the first grade of primary school (22).

CONCLUSIONS

The research carried out contributes to society and to the field of knowledge studied in relation to the processes developed in reading comprehension and academic performance, which must be applied to evaluation instruments that allow identifying in a contextualized way aspects that are important at the end of primary school. They are considered to be out of date but they are unresolved issues, specifically related to phonetic reading, primary decoding (reference, synonymy, lexical retrieval, contextualization, concepts), secondary, tertiary, categorical, and meta-semantic decoding. From the contributions of this research, any way to enhance the reading skills of students is a way to improve, develop and enhance intelligence and thinking.

The study generated evidence on what is related to the variables of reading comprehension and academic performance and identifies factors contextualized to a public school on the evidence through data, analysis, and results that poor student reading favors children's failure and girls who are intelligent, creative, and talented but whose reading level does not allow them to reach their full potential and, most seriously, continue to advance in their school years with unresolved reading difficulties, making the processes difficult in the following school years and making it difficult to present excellent performance in the development of their abilities, skills, and knowledge.

REFERENCES

1. UNESCO. Reducing global poverty through universal primary and secondary Education. Montreal: UNESCO Institute for Statistics; 2017 [Accessed May 1, 2023] Available in: <http://uis.unesco.org/sites/default/files/documents/reducing-global-poverty-through-universal-primary-secondary-education.pdf>
2. Acuña L, Pons L. La calidad de la educación básica: significados desde la práctica docente. *Ateneas*. 2018;1(41):1-17.
3. Cassany D. Tipos de lectura. Comprensión lectora. En su: Enseñar lengua. Barcelona: Graó; 1994.p.193-207.
4. Martínez-Ariza L, Cudris-Torres L, Echeverría-King LF, Niño-Vega JA. Influence of motivation on academic performance: an analysis of motivational assessment in mathematics learning. *Rev Investigación, Desarrollo e Innovación*. 2022;12(1):57-66.
5. Ochoa-Martínez OL, Díaz-Neri NM. Implementación de una narrativa digital para facilitar el aprendizaje de fracciones en la escuela primaria. *Rev Investigación, Desarrollo e Innovación*. 2021;11(3):533-544.
6. Vergara-Pareja CM, Nielsen-Niño JB, Niño-Vega JA. La gamificación y el fortalecimiento de la habilidad oral en inglés a niños de primera infancia. *Rev Investigación, Desarrollo e Innovación*. 2021;11(3):569-578.
7. Calle-Álvarez GY. La rúbrica de autoevaluación como estrategia didáctica de revisión de la escritura. *Rev Investigación, Desarrollo e Innovación*. 2020;10(2):323-335.
8. Molina Ibarra C de los Ángeles. Comprensión lectora y rendimiento escolar. *Rev Boletín REPIDE*. 2020;9(1):121-131.
9. Lamas HA. Sobre el rendimiento escolar. *Propós Represent*. 2015;3(1):313-86.
10. Cudris-Torres L, Gutiérrez-García RA, Barrios-Núñez Álvaro, Manjarres-Hernández M, Pérez-Corzo E. Comunicación familiar en universitarios colombianos. *Arch Ven Farmacol Ter*. 2020;39(3):246-249.
11. Vilchez H. Comprensión lectora y rendimiento académico de los estudiantes del I ciclo de la Facultad de Educación de la Universidad Nacional Mayor de San Marcos - Lima 2015. Perú: UNMSM; 2019. Disponible en: <https://cybertesis.unmsm.edu.pe/handle/20.500.12672/11119?show=full>
12. González, C. Naturaleza de las actividades estratégicas bajo el enfoque metodológico de aprendizaje significativo planteadas por el docente y el tipo de estrategias de aprendizaje desarrolladas por los estudiantes del nivel secundaria del área de matemática en el ámbito del distrito de ATE durante el año académico 2016. Perú: Renati; 2017. Disponible en: <https://renati.sunedu.gob.pe/handle/sunedu/3268720>
13. Sosa R. Estrategias para desarrollar la comprensión lectora en estudiantes de básico por madurez. Guatemala: Universidad del Istmo; 2016. Disponible en: <https://glifos.unis.edu.gt/digital/tesis/2016/51878.pdf>
14. De Zubiría, M. Pedagogía Conceptual. Una puerta al futuro de la educación. Bogotá: Ediciones de la U y Fundación Internacional de Pedagogía Conceptual Alberto Merani; 2018. Disponible en: <https://edicionesdelau.com/producto/pedagogia-conceptual-una-puerta-al-futuro-de-la-educacion/>
15. Molano-Castro LY, Cudris-Torres L, Barrios-Núñez Álvaro, Alvis-Barranco L, López-Castellar MA. Acompañamiento familiar y rendimiento académico en estudiantes colombianos en edad escolar. *Arch Ven Farmacol Ter*. 2020;39(3): 251-256.
16. Cudris-Moreno DM, Cudris-Torres L, Bustos-Arcón V, Olivella- López G, Medina-Pulido PL, Moreno-Londoño HA. Educational technology and academic performance in students of public educational institutions during confinement by COVID-19. *Gac Méd Caracas*. 2020;128(2S):S336-S349.
17. Cuetos, F., Rodríguez, B., Ruano, E. y Arribas, D. PROLEC-R Batería de Evaluación de los procesos lectores. Revisado. TEA Ediciones; 2006. Disponible en: <https://web.teaediciones.com/PROLEC-R-Bateria-de-Evaluacion-de-los-Procesos-Lectores--Revisad.aspx>
18. Sanz Rubiales Á, Del Valle Rivero M. L, Fernández González M, Ferreira Alonso R. Teoría y práctica del consentimiento informado. *Cuadernos de Bioética*. 2016;XXVII(1):69-78.
19. Quiroz, D. Programa de Comprensión Lectora para Niños de Tercer Grado de Educación Primaria de una

READING COMPREHENSION AND ACADEMIC PERFORMANCE

- Institución Educativa Estatal del Distrito de Chorrillos. Santiago de Surco Lima-Perú; Universidad Ricardo Palma: 2015. Disponible en: <https://repositorio.urp.edu.pe/handle/20.500.14138/739>
20. Goodman K. La lectura, la escritura y los textos escritos: una perspectiva transaccional sociopsicolingüística. International Reading Association. 1996. Disponible en: https://eva.fic.udelar.edu.uy/pluginfile.php/26558/mod_resource/content/1/Goodman%201996.pdf
21. Quispe E. Liderazgo Transformacional de la educación y la calidad educativa. Universidad Cesar Vallejo. Universidad Cesar Vallejo; Puno: 2018. Disponible en: https://repositorio.ucv.edu.pe/bitstream/handle/20.500.12692/37933/quispe_ae.pdf?sequence=1&isAllowed=y
22. Parrado-Ortiz YM, Cudris-Torres L, Gutiérrez-García RA, Jiménez-Torres J, Alvis Barranco L. Comprensión lectora en escolares de grado primero del municipio de Villavicencio. Arch Ven Farmacol Ter. 2020;39(3):263-267.

Parental school support and academic performance in students from Boyacá, Colombia

Apoyo escolar parental y rendimiento académico en estudiantes de Boyacá- Colombia

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SUMMARY

Introduction: Parental support includes important aspects such as school performance to support children and benefit their academic achievements, and in teaching practice, there is evidence of the lack of this parental involvement in the face of the support required by students.

Objective: To analyze the relationship between parental school support and the academic performance of students in two educational institutions in the municipality of Santa Rosa de Viterbo (Boyacá - Colombia) for the year 2021.

Methodology: A quantitative approach, non-experimental cross-sectional design, and correlational scope were used. The Validation for Parental Support questionnaire was applied to 444 students of the Carlos Arturo Torres Peña Educational Institution (CATP)

in the urban sector and the El Portachuelo Technical Educational Institution (IETP) in the rural sector.

Results: There is a moderate correlation between who performs the accompaniment in school activities and academic performance, concluding that if parents are the ones who perform this accompaniment, there is a positive influence on the academic performance of students.

Keywords: School support, academic achievement, study habits, rural educational institution, urban educational institution.

RESUMEN

Introducción: El apoyo parental incluye aspectos importantes como el desempeño escolar para apoyar a los hijos y beneficiar sus logros académicos, y en la práctica docente se evidencia la falta de esta

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participación de los padres frente al apoyo que requieren los estudiantes.

Objetivo: *Analizar la relación entre el apoyo escolar parental y el rendimiento académico de los estudiantes de dos Instituciones Educativas del municipio de Santa Rosa de Viterbo (Boyacá– Colombia) para el año 2021.*

Metodología: *Se utiliza un enfoque cuantitativo, diseño no experimental de corte transversal y alcance correlacional. Se aplicó el cuestionario Validación para el Apoyo Parental a 444 estudiantes de la Institución Educativa Carlos Arturo Torres Peña (CATP) del sector urbano y la Institución Educativa Técnica El Portachuelo (IETP) del sector rural.*

Resultados: *Existe una correlación moderada entre quien realiza el acompañamiento en las actividades escolares y el rendimiento académico, concluyendo que si son los padres quienes realizan este acompañamiento, existe una influencia positiva en el rendimiento académico de los estudiantes.*

Palabras clave: *Apoyo escolar, rendimiento académico, hábitos de estudio, institución educativa rural, institución educativa urbana.*

INTRODUCTION

For good development and achievement of better levels of learning in early childhood, support from parents is essential (1). The concept of family has changed over time, it is highlighted that families have experienced demographic changes in recent years with the reduction of children and spacing between them due to the use of contraceptive methods (2).

The family must contribute to the educational function that has responsibilities such as educating a child and depends on family support in the early years; however, the education of students does not depend only on teachers but also on parents and the family environment for the support of school activities (parental support). For example, in Europe, parents are trained to improve their skills by advising them on training courses. In this sense, there are different initiatives to support parents in countries such as Austria, Belgium, and Estonia; however, some parents do not use the services for fear of being considered bad parents, which is why there is a low level of participation (3).

Regarding training, in the case of the United Kingdom and Austria, they work with parents in their training; there are nurseries, training

material, workshops for parents, and meetings supported by specialists in psychology and pediatrics (3). The United States was the country that began training parents to support their children (4). Parental support policies have occurred in most countries at the European level; in Austria (1994) the international year of the family; in Belgium and Estonia recommendations about positive parenting. Interventions are carried out in parental education to raise awareness about habits, empathy, empathy with children, and children's behavior (4).

Evidence on parental support and academic performance in Latin America show that boys and girls lack parental care for various reasons, so their development is not guaranteed. Among the causes of the absence of parental care, it is necessary to consider the problems of each country at the political level (migrations, war conflicts), among the economic factors are the lack of housing; in terms of the social, there is family violence and at the cultural level child labor among others (5).

In the Colombian, according to economic, political, social, and cultural changes, families have to face problems to fulfill their functions at an educational, support, and accompaniment level due to a lack of time and resources. It should be noted that in urban communities they use daycare centers to care for their children, while in rural communities parenting is reduced to the family nucleus (6).

In Colombia, 11.2 % of children between 10 and 14 years old are without parental care; between 5 and 9 years there is an 8.2 % lack of parental care (7). It was established that the percentage of children who do not attend institutions is linked to the presence of parents at home. School absenteeism can reach 27 % when the parents have died. According to the Constitutional Court, (2012) sentence T-688 of 2012, being a father implies a series of rights and duties to provide children with adequate comprehensive development, complying with their fundamental rights.

Therefore, it is important to analyze the relationship between parental school support and the academic performance of students from two Educational Institutions in the municipality of Santa Rosa de Viterbo.

METHOD

Type of Research

The study was contemplated under the positivist paradigm, non-experimental design, quantitative approach, correlational scope, and cross-section.

Participants

An intentional sampling or sampling was used depending on the objective of the study, in which 70 students participated, corresponding to the headquarters of the Technical Educational Institution El Portachuelo Santa Rosa de Viterbo distributed by primary grade. To be part of the sample, the criterion was to be an active primary school student (Table 1, Table 2).

Table 1. Population and sample El Portachuelo Technical Educational Institution

Aspect	Description
Population	El Portachuelo Technical Educational Institution Santa Rosa de Viterbo Boyacá Total 166 students Venues: Ciraquita, La Mesa, Quebrada Arriba, Quebrada Grande, Portachuelo.
Study population	Primary school students 70
Sample	Primary school students 70

Source: own authorship

Table 2. Primary school students by location (sample).
New school

Campus	Degree	Students
La Mesa School	First	2
	Second	2
	Third	3
	Room	3
	Fifth	3
Quebrada Grande School	First	2
	Second	3
	Third	4
	Room	5
	Fifth	2
Headquarters	First	3
	Second	8
	Third	5
	Room	7
	Fifth	5
Quebrada Arriba School	First	1
	Second	2
	Third	3
	Room	0
	Fifth	1
Siraquita	First	0
	Second	2
	Third	2
	Room	0
	Fifth	2

Source: El Portachuelo Technical Educational Institution Santa Rosa de Viterbo Boyacá, 2021

Instruments

Two instruments were applied, the first was the questionnaire on parental support (8), which evaluates the involvement of parents in children's school activities, based on 6 categories: guided behaviors (punctuality, attendance, control of reading habits, study, grades, and social behavior), assisted performance (homework control, exam control, time control), problem-solving help (help with difficult tasks), joint activities (visits to school places and school activities), modeling (parental activities) and media (school supplies, reference books, furniture); The questionnaire consists of 40 multiple-choice questions with a Likert scale (0 - never, 2 almost never, 3 sometimes, 4 almost always and 5 always), with a Cronbach's Alpha of 0.839.

The second instrument was carried out by the Junta de Andalucía, made up of 30 questions that measure 3 factors: i) environment and external conditions, ii) organization and planning, and iii) use of study techniques. It is a Likert-type questionnaire with options of never, sometimes, and always, which when qualified have scores of 15 and 20 (good/adequate), 8 to 14 (regular/improvable), and 0 to 7 (weak/inadequate). This was validated in a group of 5 expert professionals, with no suggested modifications (9).

Data Analysis

The analyzes were performed with the help of the statistical package SPSS Version 25, in which the following procedures were performed: Pearson's correlation, a test that measures the statistical relationship between two quantitative variables. The linear correlation coefficient function is a formula that returns the linear correlation coefficient between two variables. It is a very simple statistical concept to understand that measures the degree of relationship between two sets of data. The correlations determine if there is a relationship between two variables and that it is not random, but, in effect, statistically significant. The correlation coefficient measures the strength with which one variable influences the other, which can be positive if both variables grow together, or negative, in case of the opposite.

The results are expressed numerically, the closer the value is to one, the stronger the positive correlation; if one variable is stronger, the other will be in turn; while the closer the value is to -1, the stronger the negative correlation will be; the less strong the variable is, the stronger the other will be, if the value is zero, the correlation will be zero.

Ethical considerations

The present work accepted the Law 1581 of 2012, the principle of confidentiality. It is clarified that personal data is not used and privacy and confidentiality regarding the personal data of the participating subjects is guaranteed. The information collected is disclosed keeping the identity of the participants complete. Through informed consent, the privacy notice is taken into account. Likewise, the handling of sensitive data whose improper use can generate discrimination or reveal orientations, and religious convictions to guarantee the rights and guarantees of the study participants was taken into account.

RESULTS

30.1 % of the students were at the age of 7, that is, 25 students; followed by 18.1 % with

8-year-old students with 15 students, then 16.9 % with 6 and 11-year-olds. With 9.6 % there are 9-year-old students, 10-year-old students with 7.2 %, and over 11 years with 1.2 %.

It was established that 92.8 % of the students, that is, 77, are located in stratum 1. 6 % in stratum 2, which corresponds to 5 students, and one student responds that in stratum one, with 1.2 %.

Regarding the accompaniment in school activities, 72.3 % only do the mother according to 60 students. The brothers carry out the accompaniment in 12 % for 10 students.

84.3 % of the students affirm that the parents have a primary educational level which corresponds to 70 parents. 8.43 % of the students affirm that their parents have a secondary educational level (7 students). 4.8 % without education and 1.2 % do not have a father and another 1.2 % incomplete primary school.

Relationship between parental support variables and academic average Portachuelo Institution

It is observed that the average has a low correlation with behavior control (0.200), task control (0.212), exam control (0.206), and time control (0.219). Although the correlations are low, the ones that stand out are the control of tasks and the control of time, this shows a little the favorability of this type of control carried out by parents when the students are evaluated and give good results in their grades (Table 3).

On the other hand, the strong influence of habit control on task control is observed (0.842) as a result of a high correlation between these two variables, it is also observed that habit control has a high relationship with task control (0.842), examination control (0.816), homework help (0.838) and parental activities (0.820). Exam control has a high correlation with task control (0.887) and helps with difficult tasks (0.842). This shows that when parents pay attention to homework and help their children with difficult tasks, they become even more interested in their test results. The other correlations are below 0.7, being moderate to very low, most of them are moderate correlations.

Table 3. Total correlations Portachuelo educational institution.

		Correlations											
		Average First period	Punctuality	Habit control	Grade control	Behavior control	Task control	Exam control	Time control	Homework help	Visits to cultural places	Parent activities	School supplies
Average First period	Pearson correlation	1	-0.023	0.076	0.109	0.200	0.212	0.206	0.219*	0.106	-0.193	0.112	0.129
	Sig. (bilateral)	0.833	0.493	0.326	0.069	0.054	0.062	0.047	0.340	0.081	0.312	0.246	
Punctuality	Pearson correlation	-0.023	1	0.338**	0.300**	0.176	0.387**	0.371**	0.397**	0.371**	0.150	0.164	0.053
	Sig. (bilateral)	0.833		0.002	0.006	0.112	0.0001	0.001	0.0001	0.001	0.177	0.137	0.636
Habit control	Pearson correlation	0.076	0.338**	1	0.456**	0.517**	0.842**	0.816**	0.544**	0.838**	0.345**	0.820**	-0.104
	Sig. (bilateral)	0.493	0.002		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001	0.0001	0.351
Grade control	Pearson correlation	0.109	0.300**	0.456**	1	0.486**	0.481**	0.596**	0.382**	0.541**	0.204	0.383**	0.112
	Sig. (bilateral)	0.326	0.006	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001	0.064	0.0001	0.312
Behavior control	Pearson correlation	0.200	0.176	0.517**	0.486**	1	0.484**	0.523**	0.311**	0.487**	0.289**	0.477**	0.092
	Sig. (bilateral)	0.069	0.112	0.0001	0.0001		0.0001	0.0001	0.004	0.0001	0.008	0.0001	0.410
Task control	Pearson correlation	0.212	0.387**	0.842**	0.481**	0.484**	1	0.887**	0.578**	0.842**	0.299**	0.748**	-0.023
	Sig. (bilateral)	0.054	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.006	0.0001	0.839
Time control	Pearson correlation	0.206	0.371**	0.816**	0.596**	0.523**	0.887**	1	0.508**	0.844**	0.316**	0.706**	0.025
	Sig. (bilateral)	0.062	0.001	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.004	0.0001	0.824
Time control	Pearson correlation	0.219*	0.397**	0.544**	0.382**	0.311**	0.578**	0.508**	1	0.583**	0.062	0.489**	0.061
	Sig. (bilateral)	0.047	0.0001	0.0001	0.0001	0.004	0.0001	0.0001		0.0001	0.580	0.0001	0.582
Homework help	Pearson correlation	0.106	0.371**	0.838**	0.541**	0.487**	0.842**	0.844**	0.583**	1	0.360**	0.740**	0.006
	Sig. (bilateral)	0.340	0.001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.001	0.0001	0.958
Visits to cultural places	Pearson correlation	-0.193	0.150	0.345**	0.204	0.289**	0.299**	0.316**	0.062	0.360**	1	0.510**	-0.392**
	Sig. (bilateral)	0.081	0.177	0.001	0.064	0.008	0.006	0.004	0.580	0.001		0.0001	0.0001
Parent activities	Pearson correlation	0.112	0.164	0.820**	0.383**	0.477**	0.748**	0.706**	0.489**	0.740**	0.510**	1	-0.231*
	Sig. (bilateral)	0.312	0.137	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.035
School supplies	Pearson correlation	0.129	0.053	-0.104	0.112	0.092	-0.023	0.025	0.061	0.006	-0.392**	-0.231*	1
	Sig. (bilateral)	0.246	0.636	0.351	0.312	0.410	0.839	0.824	0.582	0.958	0.0001	0.035	

*. The correlation is significant at the 0.05 level (bilateral).
 **. The correlation is significant at the 0.01 level (bilateral).
 Note: own authorship.

Relationship between parental support variables and the average

It is observed that the average has a low correlation with control of habits (0.226), control of tasks (0.287), control of exams (0.305), control of time (0.283), and help with difficult tasks (0.325). Although the correlations are low, the ones that stand out are the control of exams and the control of tasks, this shows the favorability of this type of control carried out by the parents at the time the students are being evaluated and giving good results in their grades (Table 4).

DISCUSSION

In the rural institution, the accompaniment in school activities is in charge of only the mother with 72.3 % while in the urban institution, the accompaniment is in charge of both parents with 38.2 %, as the highest percentage. The educational level of the parents and the person who advises is primary with the highest percentages in the rural institution, while in the urban institution, the educational level in all three cases is secondary. In a study that analyzes the school accompaniment of children by their mothers, 58 % of mothers show little participation in the communication and surveillance of the school due to the limited availability of time (2-10).

These results are contrasted with another study, in which they mention that it is especially the mothers who accompany their children, many of them are single and have responsibility for everything in the home (6-11). It is pointed out that the availability that families have to dedicate to their sons and daughters in their formative process is reflected in the economy and the availability of time. They showed that a large part of the minors, due to the absence of their parents and being left alone in their homes, are forced to turn to other authority figures such as older siblings, neighbors, grandparents, uncles, or other relatives.

It is highlighted that the COVID-19 pandemic revealed the importance of parental support since families had to support the learning process and demonstrated that the educational deficiencies of the parents and their ability to contribute

to homework crucially affected the results. of students during quarantine (12). It was shown that parents who support their children make them more motivated to learn by adopting positive attitudes. Parents can model positive behaviors and attitudes towards school by expressing the importance of learning, generating a positive impact on learning (13), which is reinforced using family policies to encourage school attendance and learning by promoting positive learning outcomes (4-14).

While in the rural institution, at home they encourage to study sometimes 65.06 %, in the urban institution the support is always given with 59.33 %. Compared to whether they provide a place and time to study in the rural institution sometimes with 69.87 % but in the urban institution it always reaches 68.52 %. The study gives an adequate site in the rural institution sometimes with 72.3 % and always in the urban institution with 60.16 %. Regarding the use of technological means to study in rural institutions, it sometimes occurs with 42.16 % while in urban ones sometimes with 54.40 %. The foregoing contrasts with an investigation in which 35 % of mothers declare that they have an inadequate environment for the study of their children due to interference and noise from the TV, the Internet, and others, followed by 33 % who affirm that it is inadequate, likewise 7 % state that they have an unsuitable environment with noise and interference and 23 % conclude that they consider it to be very adequate (10). The organization of a schedule to study coincides in the two institutions with a sometimes with 62.26 % in the rural institution and 58.49 % in the urban one. As for whether it includes rest times, it is sometimes answered with a similar percentage of 60.245 and 61.28 %. If the schedule is regularly met, the maximum percentage is in the rural institution at 68.67 % and in the urban institution at 61.83 % sometimes.

In response to whether the necessary resources are available to study in the rural institution, the answer is sometimes 75.90 %, and in the urban institution always 54.59 %. In a study, they concluded that parental involvement in Uganda in the form of temporary involvement and resources for the education of their sons and daughters played an essential role in motivating them to improve their academic grades (15). The use of

Table 4. Relationship between parental support variables and the average

		Average First period	Punctuality	Habit control	Grade control	Correlations Behavior control	Task control	Exam control	Time control	Homework help	Visits to cultural places	Parent activities	School supplies
Average First period	Pearson correlation	1	0.116*	0.226**	0.220**	0.164**	0.287**	0.305**	0.283**	0.325**	0.120*	0.112*	-0.108*
	Sig. (bilateral)		0.031	0.0001	0.0001	0.002	0.0001	0.0001	0.001	0.0001	0.025	0.038	0.046
Punctuality	Pearson correlation	0.116*	1	0.579**	0.418**	0.460**	0.586**	0.536**	0.398**	0.487**	0.203**	0.376**	-0.364**
	Sig. (bilateral)	0.031		0.0001	0.00001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Habit control	Pearson correlation	0.226**	0.579**	1	0.560**	0.641**	0.736**	0.698**	0.626**	0.687**	0.384**	0.576**	-0.317**
	Sig. (bilateral)	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Grade control	Pearson correlation	0.220**	0.418**	0.560**	1	0.555**	0.697**	0.631**	0.534**	0.636**	0.329**	0.323**	-0.014
	Sig. (bilateral)	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.796
Behavior control	Pearson correlation	0.164**	0.460**	0.641**	0.555**	1	0.774**	0.714**	0.580**	0.649**	0.306**	0.388**	-0.196**
	Sig. (bilateral)	0.002	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Task control	Pearson correlation	0.287**	0.586**	0.736**	0.697**	0.774**	1	0.875**	0.723**	0.795**	0.346**	0.426**	-0.247**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Time control	Pearson correlation	0.305**	0.536**	0.698**	0.631**	0.714**	0.875**	1	0.683**	0.804**	0.400**	0.476**	-0.297**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.0001	0.0001
Time control	Pearson correlation	0.283**	0.398**	0.626**	0.534**	0.580**	0.723**	0.683**	1	0.758**	0.259**	0.397**	-0.174**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001	0.001
Homework	Pearson correlation	0.325**	0.487**	0.687**	0.636**	0.649**	0.795**	0.804**	0.758**	1	0.393**	0.480**	-0.234**
	Sig. (bilateral)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001	0.0001	0.0001
Visits to cultural places	Pearson correlation	0.120*	0.203**	0.384**	0.329**	0.306**	0.346**	0.400**	0.259**	0.393**	1	0.530**	-0.105*
	Sig. (bilateral)	0.025	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001	0.048
Parent activities	Pearson correlation	0.112*	0.376**	0.576**	0.323**	0.388**	0.426**	0.476**	0.397**	0.480**	0.530**	1	-0.231**
	Sig. (bilateral)	0.038	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001		0.0001
School supplies	Pearson correlation	-0.108*	-0.364**	-0.317**	-0.014	-0.196**	-0.247**	-0.297**	-0.174**	-0.234**	-0.105*	-0.231**	1
	Sig. (bilateral)	0.046	0.0001	0.0001	0.796	0.0001	0.0001	0.0001	0.001	0.0001	0.048	0.0001	

*. The correlation is significant at the 0.05 level (bilateral).
 **. The correlation is significant at the 0.01 level (bilateral).
 Note: own authorship.

notes on what has to be done every day in the rural institution never with 62.65 % while in the urban sometimes with 57.38 %. When inquiring if you study every day in a rural institution sometimes with 68.67 % and in the urban with 56.82 % always. The completion of jobs on time occurs sometimes in the rural institution with 81.92 % and in the urban with 59.88 %. Regarding the education of time for each task, it sometimes occurs in the rural institution with 73.49 % and in the urban 68.80 %. As for whether you study only on the day of the exam in the rural institution sometimes with 83.13 % and in the urban never with 52.36 %.

Compared with planning when studying, the conclusions of the OECD's Program for International Student Assessment (PISA) confirm that parental involvement in education is essential for the success of students in their learning. Families become aware of how to plan and supervise the learning process, developing skills in their children. In addition, the study indicates that teachers may pay more attention to students when they know that their families are more involved (6,7-16).

The parents of the rural institution almost never ask their children about the progress of their children's studies 44.57 % while the parents of the urban institution almost always 35.65 %, that is, they are more aware of the advances at the level educational of their children. In another study, 61 % of mothers have little involvement in the formation of their children's study habits, affirming that the school monitoring of their children is limited by the little availability of time for supervision, formation of study habits, and inactive participation in academic meetings (10).

Faced with grade control in the rural institution, parents are only sometimes pending with 40.96 %, while in the urban institution, they are always pending with 44.84 %. It is observed that in the rural institution, the parents almost always have 32.53 % realize the grades by the end of the year, and never in the urban institution with 59.33 %. 56.62 % of the students of the rural institution sometimes with 56.62 % being scolded by parents and in the urban 38.99 % are almost always scolded. Regarding the attendance of parents to sign the qualifications every two months, 62.26 % of the rural institution almost always go and

38.44 % always go to sign the academic notes.

In an investigation, 53 % of working mothers have inadequate control over the fulfillment of their children's tasks due to the limited availability of time (10). Family members assume, 41 %, of the determining role of task control, likewise, 39 % trust their children and leave them to their full power, on the other hand, 14 % prefer to control through an advisor, followed by 6 % that declare to monitor the tasks through the cell phone, for what is considered that there is abandonment in the supervision and guidance of the control of tasks. Homework becomes a potential reinforcer of the contents acquired during the school day. Participating in the school life of the children is helping in the completion and review of homework (3-17).

Regarding exam control, parents almost always realize the dates in the two institutions with close percentages. Parents put them to study for school exams sometimes with 63.23 % in the rural institution and almost always 40.66 % in the urban ones. In the rural institution, parents almost never correct the exams 63.23 % and almost always in the urban ones with 35.37 %. Faced with time control and going out to play with parental supervision, the answer is sometimes 34.93 % in rural institutions and 56.54 % in urban ones. Parents scold when they go out to play without warning sometimes with 44.57 % in the rural institution and in the urban almost always with 37.60 %. The parents of the rural institution help their children when they do not understand the tasks sometimes in 53.01 % and the urban institution almost always with 41.78 % showing a greater degree of interest. Other authors establish that there is no consensus on how much parental help with homework affects academic results (18-21).

According to the results, it can be affirmed that the students show an adequate level of accompaniment to the parents in terms of study habits. By having parental supervision, parents offer their children support to carry out homework, which produces positive effects on the use of certain strategies such as organization and regulation. Students who do not have parental guidance have more difficulties to understand school content, obtaining lower results. Several authors affirm that the family is a vital agent in

the learning process, in the cognitive, affective, and social spheres (17,22-24).

CONCLUSIONS

Greater support was found for studying in the urban institution and a better arrangement of the place of study in the urban institution. Likewise, in the use of technological means, the urban institution stands out. There are no differences in terms of the organization of study schedules, or rest times. Regarding the necessary resources to study, deficiencies are seen in the students of the rural institution. When inquiring about study techniques such as the use of notes, use of a dictionary, and summaries among others, they are techniques most used by students of the urban institution.

It can be established that, if there is a relationship between parental school support and the school performance of primary school students from a rural and an urban institution in Santa Rosa de Viterbo Boyacá, based on statistical analysis, it can be concluded that the relationship is minimal, since the correlation coefficients oscillate between 0.1 and 0.35 in the association of variables that determine parental control and the average of the students. It is important to highlight that there is a moderate correlation between who performs the accompaniment in school activities and academic performance, concluding that if it is the parents who carry out this accompaniment, there is a positive influence on the academic performance of the students. On the other hand, a great influence of parental support was identified in the study habits implemented by the students in elementary schools of both institutions. This does not mean that the study does not work, it means that parents influence the average, but they are the determining factor for high student performance.

REFERENCES

1. CEPAL. Cuidados en América Latina y el Caribe en tiempos de COVID-19. Hacia sistemas integrales para fortalecer la respuesta y la recuperación. Naciones Unidas: ONU Mujeres-CEPAL. 2020. Disponible en: <https://www.cepal.org/es/publicaciones/45916-cuidados-america-latina-caribe-tiempos-covid-19-sistemas-integrales-fortalecer>
2. Mesa L, Tilano L. La relación dialéctica entre las transformaciones sociales y los modelos de organización familiar: Consideraciones de algunas familias monoparentales, homoparentales y compuestas en Medellín. Universidad de Antioquia; 2018.p.9. <http://bibliotecadigital.udea.edu.co/handle/10495/15141>
3. Molinuevo D. Parenting support in Europe. Eurfound. European Commission: Thomas Huddleston; 2013. Available in: https://ec.europa.eu/migrant-integration/library-document/parenting-support-europe_en
4. Cano A. Sentido y fundamento de las Escuelas de Padres y Madres: Orientaciones para una responsabilidad compartida. Universidad Complutense de Madrid. 2015. Disponible en: <https://eprints.ucm.es/id/eprint/30797/>
5. Red Latinoamericana de acogimiento familiar RELAF. Documento de divulgación latinoamericano. Niños, niñas y adolescentes sin cuidados parentales en América Latina. UNESCO: RELAF. 2010. Disponible en <https://catalogosiidca.csuca.org/Record/UDELAS.044481>
6. Ministerio de Educación Nacional. Plan especial de educación rural. Hacia el desarrollo rural y la construcción de paz. MINEDUCACIÓN; 2017. Disponible en: https://www.mineducacion.gov.co/1759/articulos-385568_recurso_1.pdf
7. DNP. Familia infancia y adolescencia. Observatorio de familias. Departamento Nacional de Planeación. 2019. Disponible en: <https://observatoriodefamilia.dnp.gov.co/Documents/Boletines/BOLETIN%20No%2012.pdf>
8. Barbar DME, Coronel IM. Estilo parental, apoyo en el ámbito escolar y rendimiento académico en adolescentes. Pontificia Universidad Católica Argentina; 2022. Disponible en: <https://repositorio.uca.edu.ar/bitstream/123456789/15838/1/estilo-parental-apoyo.pdf>
9. Angulo MC, Fuentes-Hernández LM. Cuestionario hábitos de estudio de mi hijo (a). Ayuda a tu hijo o hija en los estudios. Colección Saber – Ayuda a tu hijo e hija en los estudios: enséñales los hábitos y técnicas de estudio. Escuela de familias. Junta de Andalucía. 2006. Disponible en: <https://www.juntadeandalucia.es/educacion/portals/delegate/content/85a2775a-1c29-48b5-8ffe-93fa43ffc9ba>
10. Vilcas L. Acompañamiento escolar de hijos por sus madres que trabajan en el Ministerio de Salud del Distrito de Huanca. Universidad Nacional del centro del Perú; 2017. Disponible en: <https://repositorio.uncp.edu.pe/handle/20.500.12894/4516>

11. Lan Fuentes YT, Blandón Restrepo DM, Rodríguez Velencia MM, Vásquez Raigoza LE. Acompañamiento Familiar en los Procesos de Aprendizaje. Universidad de San Buenaventura: 2013. Disponible en: <https://bibliotecadigital.usb.edu.co/entities/publication/d7266c10-8ac8-4942-9e2a-1a1d6cc0f4f8>
12. Winthrop R, Ershadi M, Angrist N, Bortsie E, Matsheng M. A historic shock to parental engagement in education: Parent perspectives in Botswana during COVID-19. Brookings Center for Universal Education: October 2020. Available in: <https://www.brookings.edu/wp-content/uploads/2020/11/Parent-perspectives-in-Botswana-during-COVID-19-FINAL.pdf>
13. Martínez-Ariza L, Cudris-Torres L, Echeverría-King LF, Niño-Vega JA. Influence of motivation on academic performance: An analysis of motivational assessment in mathematics learning. *Rev Invest Desarr Innov.* 2022;12(1):57-66.
14. Richardson D, Dugarova E, Higgins D, Hirao K, Karamperidou D, Mokomane Z, et al. Families, family and the sustainable development goals. Innocenti Research Report. Florence: UNICEF; Office of Research – Innocenti. 2020. Available in <https://www.unicef-irc.org/publications/1092-families-family-policy-and-the-sustainable-development-goals.html>
15. Mahuro G, Hungi N. Parental participation improves student academic achievement: A case of Iganga and Mauge districts in Uganda. *Cogent Education.* 2016;3(1):14-24.
16. OECD Organization for Economic Cooperation and Development. Let's read them a story! The parent factor in education. OECD Publishing. 2012. Available in: <https://learningportal.iiep.unesco.org/es/fichas-praticas/mejorar-el-aprendizaje/el-apoyo-parental-al-aprendizaje>
17. Martínez M, Suárez J, Valiente C. Implicación estudiantil y parental en los deberes escolares: Diferencias según el curso, género y rendimiento académico. *J Psychol Educ.* 2020;15:151-165.
18. Van Voorhis F. Interactive homework in middle school: Effects on family involvement and students' science achievement. *J Educ Res.* 2003;96:323-339.
19. Cooper H, Robinson JC, Patall EA. Does Homework Improve Academic Achievement? A Synthesis of Research, 1987-2003. *Rev Educ Res.* 2006;76(1):1-62.
20. Cudris-Torres L, Gutiérrez-García RA, Barrios-Núñez Álvaro, Manjarres-Hernández M, Pérez-Corzo E. Comunicación familiar en universitarios colombianos. *Arch Ven Farmacol Ter.* 2020;39(3):246-249.
21. Molano-Castro LY, Cudris-Torres L, Barrios-Núñez Álvaro, Alvis-Barranco L, López-Castellar MA. Acompañamiento familiar y rendimiento académico en estudiantes colombianos en edad escolar. *Arch Ven Farmacol Ter.* 2020;39(3):251-256.
22. Villa-Guardiola VJ, Romero-González Z, Hernández-Ramírez SL. Evaluación del impacto del COVID-19 en la educación básica de México y Colombia. *Rev Invest Desarr Innov.* 2022;12(2):229-238.
23. Vergara-Pareja CM, Nielsen-Niño JB, Niño-Vega JA. La gamificación y el fortalecimiento de la habilidad oral en inglés a niños de primera infancia. *Rev Invest Desarr Innov.* 2021;11(3):569-578.
24. Hernández-Suárez CA, Avendaño-Castro WR, Rojas-Guevara JU. Planeación curricular y ambiente de aula en ciencias naturales: de las políticas y los lineamientos a la aplicación institucional. *Rev Invest Desarr Innov.* 2021;11(2):319-334.

Family functioning and self-harm behaviors in adolescents and young people in the municipality of Valledupar-Colombia

Funcionamiento familiar y conductas de autolesión en adolescentes y jóvenes del municipio de Valledupar-Colombia

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SUMMARY

Introduction: *There are risk factors associated with the life cycle of adolescence and early adulthood, such as depression and hopelessness, disappointment and guilt at the impossibility of meeting parental expectations, family problems, a history of suicide in relatives, friends, and/or colleagues, difficulties in communication, a tendency to isolation, few interpersonal relationships, abuse of psychoactive substances, cuts or blows to the body, ideas, fantasies or previous attempts, considering suicide as a*

heroic act. Suicidal ideation and behavior in adolescence and youth is a public health problem with emotional, family, economic, and social consequences.

Aim: *Relate family functioning with self-harm behaviors in adolescents and young people in the municipality of Valledupar.*

Materials and methods: *Quantitative, correlational, cross-sectional study, the sample included 150 people, 64.67 % (n=97) of whom identified themselves as women and 35.33 % (n=53) perceived themselves as men. The age ranged from 12 to 29 years, with a mean and standard deviation of 20.55 and 5.52 (CV=26.86 %), respectively, the participants*

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reside in the city of Valledupar, to whom a questionnaire that measures characteristics was applied sociodemographic, family APGAR, Hamilton anxiety, and depression scales. For the statistical analysis, an exploratory analysis was carried out to verify that there were no transcription errors in the database. In addition, the parametric assumptions of the Pearson correlation coefficient were verified, on the other hand, the association between family functioning and self-injurious behaviors was examined employing the Chi-Square test of independence, constructing contingency tables for it.

Results: The findings suggest that the participants exhibit severe dysfunction; the average anxiety score of young people or adolescents would imply a mild level, while the mean values of depression would be associated with a severe manifestation. No statistically significant association was found between family functioning, the anxiety and depression symptoms of the participants, nor was there a statistically significant relationship between family functioning and self-harm behaviors.

Keywords: Family functioning, family cohesion, suicidal ideation, suicidal behavior.

RESUMEN

Introducción: Existen factores de riesgo asociados al ciclo vital de la adolescencia y adultez temprana como son: depresión y desesperanza, decepción y culpa ante la imposibilidad de satisfacer las expectativas paternas, problemas familiares, antecedentes de suicidio en familiares, amigos y/o compañeros, dificultades en la comunicación, tendencia al aislamiento, escasas relaciones interpersonales, abuso de sustancias psicoactivas, cortes o golpes en el cuerpo, ideas, fantasías o intentos previos, considerar al suicidio como un acto heroico. La ideación y conducta suicida en la adolescencia y juventud es un problema de salud pública con consecuencias emocionales, familiares, costo económico y social.

Objetivo: Relacionar el funcionamiento familiar con las conductas de autolesión en adolescentes y jóvenes del municipio de Valledupar.

Materiales y métodos: Estudio cuantitativo, de tipo correlacional, corte transversal, la muestra abarcó 150 personas, 64,67 % (n=97) de los cuales se identificaron como mujeres y 35,33 % (n=53) se autopercebieron como hombres. La edad varió desde 12 hasta 29 años, con promedio y desviación estándar que se ubicaron en 20,55 y 5,52 (CV=26,86 %), respectivamente. Los participantes residen en la ciudad de Valledupar, a los que se les aplicó un cuestionario que mide características sociodemográficas, APGAR familiar, las escalas de ansiedad y depresión de Hamilton; para el análisis estadístico se realizó un análisis exploratorio para verificar que no existiesen errores de transcripción en la base de datos. Además, se comprobaron los supuestos paramétricos del coeficiente de correlación de Pearson, por otra parte, la asociación entre el funcionamiento familiar y las conductas de autolesión fue examinada por medio de la prueba Chi-cuadrado de independencia, construyendo para ello tablas de contingencia.

Resultados: Los hallazgos sugieren que los participantes exhiben una disfunción severa; el puntaje promedio de ansiedad de los jóvenes o adolescentes implicaría un nivel leve, mientras que los valores medios de depresión se asociarían con una manifestación severa; no se encontró una asociación estadísticamente significativa entre el funcionamiento familiar, la sintomatología de ansiedad y depresión de los participantes como tampoco una relación estadísticamente importante entre el funcionamiento familiar y las conductas de autolesión.

Palabras clave: Funcionamiento familiar, cohesión familiar, ideación suicida, conducta suicida.

INTRODUCTION

According to the World Health Organization (WHO), each year approximately 703 000 people take their own lives and others attempt to do so. These cases negatively impact families, friends, communities, and countries. Suicide is a phenomenon that can occur at any age, and in 2019 it was the fourth leading cause of death in the 15-29 age group worldwide. Suicides occur

in all regions of the world; this is how more than 77 % of suicides that occurred in 2019 took place in low- and middle-income countries (1).

It has been found that in Europe more than 50 % of the people who die by consummated suicide were depressed, within these groups, the adolescent population and the elderly can be distinguished since the moment of increasing depressive symptoms or becoming chronic frequently can lead to suicide (2). This is how they confirm that suicide and self-harm are common in people suffering from depression, since when being in a depressed state, coping with conflicts decreases, which before seemed normal, can now disturb them, cognitive processes deteriorate, among others, and consequently, many choose to take their own life or attack their own body.

In addition, analyzing this perspective throughout the world, it is considered that approximately 90 % of people who commit suicide generally have a mental health problem, depression in the first instance, and the risk of a person suffering from it involves many factors. which are associated with increasing the probability that it is superior to other mental disorders such as anxiety and the consumption of psychoactive substances (3,4). This explains that self-elimination or self-injury occurs from a multi-causality in which risk factors such as depression, anxiety, and substance use, among others, participate, that in the vast majority of people, the manifestation of these mental problems can help prevent. These behaviors that, as already mentioned, have been increasing.

However, the Pan American Health Organization (PAHO) affirms that the COVID-19 pandemic increased the risk factors for suicide, the most prominent being anxiety and depression, in which violence, alcohol consumption disorders, abuse of substances, and sensations of loss (5). In addition to individual problems, risk factors must be taken into account that, although they were not foreseen, add up and exacerbate this difficulty, as is the case with COVID-19, which increased or accelerated the onset of mental disorders in people, thus also increasing the risk of suicide, since this leads to the activation of public health protective agents to face novel stimuli and seek both efficient and effective solutions to new

problems that maintain comorbidity with self-elimination and self-injurious behaviors (6).

Entering the National context, in Colombia people who decide to self-eliminate have a complex interaction with risk factors that vary according to the evolutionary cycle, standing out in the child population, adolescents, and emerging adults.

In Colombia, researchers developed a study in which they explained in detail the risk of death by suicide from the year 2000 to 2013 in the Colombian country. It is relevant to mention that since the year 2000, worldwide, self-elimination was among the first 15 causes of death, however, in Colombia has been a minor event, since these authors mention that out of every 4 out of 100 000 inhabitants attempt suicide (7). They mention that the age group with the highest incidence are adolescents and young people, they are in periods between 15 and 34 years of age which allows them to be recognized with mental disorders such as depression, anxiety, bipolarity, schizophrenia, a mental disorder due to drug use, family moral values. Among the regions with the highest risk of presenting such self-elimination behaviors are the Central, and Eastern, and those with the lowest risk are the Caribbean-Insular (7). In this investigation about the beginning of the 21st century, it is observed that in comparison with other countries Colombia maintains a low prevalence in terms of suicide, it is alarming that the most vulnerable groups are adolescents and young people since they are people who are beginning their life cycle, they have many experiences left to live and contribute to society, but due to difficulties that arise such as mental anxiety disorders, depression, drug abuse and deficiencies in family functioning, many of them choose to harm themselves or in worst case take your own life.

Likewise, in an investigation carried out on adolescents from the Department of Atlántico (8), they found a positive correlation between people with suicidal ideation and family dysfunction, where they reveal a greater family dysfunction, the degree of suicidal ideation increases. On the other hand, suicidal ideation was higher in the female gender, since they involve risk factors such as sexual abuse, school, and social bullying, lack

of parental support, a deficit in sexual orientation, and sexual violence between partners, although men have more likely to attempt suicide because they adopt more lethal and violent means than women (8). The results of the study mention several relevant aspects, the first is the relationship that family dysfunction maintains with suicidal ideation, this allows us to take into account the essential role that a family has aimed at supporting and positively linking all its members, in what it can prevent self-injurious behaviors if those family functions that show more support, integration, adaptation in their members are reinforced; on the other hand, the female gender, although it presents higher statistics in suicidal ideation, it is the male gender who consumes the act in a greater proportion for the known reasons, these data at the national level agree with those explained above at the global level.

Therefore, it is necessary to understand self-elimination that includes various contexts, such as health, emotional and social in the individual, in which to commit such acts there are components of absence of psychological (behavioral) resources, intense suffering (emotional) and perception of death as the only solution (cognitive), suicidal ideation becomes a problem that transcends the individual and is suffered by the entire family system (9). Therefore, this problem begins to be understood to be intervened not only in the individual but also in its subsystems that affect to prevent or exacerbate them.

Likewise, it is important to understand self-injurious behaviors such as self-inflicted harm without suicidal intention, to displace emotional pain to a physical one, however, this can be an indicator of self-elimination for the future, also when the adolescent perceives deficient family cohesion, poor adaptability, low assertive communication along with shortcomings in socio-cultural characteristics such as values, rules, control, and discipline act as a risk factor in the face of inadequate behavioral and emotional manifestations in said population, in addition where non-compliance with rules is observed at home, less time shared, misunderstanding between members, and loss of privacy due to social networks are causes that exacerbate family conflicts and therefore self-injurious behaviors (10-12). These risk factors described

further clarify the problem that is being presented, since adolescence and emerging adults are in transition stages, that is, a young person is not a new individual, it is the same being that has been accumulating experiences that can form excellent or deficient mental health, according to their family structure and functioning, hence the importance of understanding this problem not only from mental disorders, but also from the closest contexts in the individual that may or may not influence making choices that threaten against his life.

Therefore, self-elimination is understood as an expression contrary to life, since the people who try it could have deteriorated their dignity, for which it is not enough to explain this from a biological or psychological approach, but it is necessary to consider the person as an integral being and influenced by systems and subsystems that make it up (13).

Thus, entering the local sector, in the city of Valledupar, it is necessary to mention that the municipality is in a demographic transition, to the extent that there is population growth that includes the presence of psychosocial problems, such as increased unemployment, poverty, presence of invasions in the periphery of the city, migration of the Venezuelan population, and presence of common crime, explaining the deterioration in the quality of life in different population groups (14).

Therefore, it is found that, in the last 4 years, Valledupar has been presenting an atypical situation in terms of suicide, the child, youth, and elderly victim population has increased; the trend of male victims is higher in proportion to the female 8 to 1, compared to the global trend that is 4 to 1 and the national trend that is 6 to 1 for 2018 (15). Therefore, if the behavior of the event were regular, it would be easier to intervene, implementing prevention strategies that contribute to reducing the incidence of events in different age groups, but the phenomenon of multi-causality makes it unpredictable how it will behave the incidence of the event.

In this same order of ideas, the Valledupar Local Health Secretary indicates that, in the period from January to December of the same year, 67 % of women attempt suicide, leaving men with 33 % of attempted suicide. Similarly, 69 % are adults.

The substances they use to eliminate themselves are intoxication (69 %), sharp weapons (17 %), hanging (8 %), burns, firearms, vacuum throwing, and vehicle throwing (1 %). Of these, 36 % had previous events, 69 % are single, 23 % live in free union, 6 % are married, the predominant schooling is high school with 48 % (16). Finally, chronologically, they present that in 2018 there were 297 suicide attempts, in 2019, 330 attempts, in 2020, 244 suicide attempts, and in 2021, 231 reported events, from which the year most predominant was 2019, considering that it was a period where the COVID-19 pandemic was experienced.

One aspect of concern in the case of the city of Valledupar is that, during 2021, the primary data-generating units reported 231 cases of suicide attempts, of which 184 were people between the ages of 15 and 44 years that 80 % of the people who self-injured are in the life cycle of adolescence and intermediate adulthood (17).

The above motivated the need to study in depth the relationship between family functioning as a fundamental social support network and self-harm behaviors in adolescents and young people residing in the city of Valledupar.

METHODS

The study used a non-experimental design, with a quantitative approach, correlational scope, and moment of cross-sectional study. The population was made up of 297 people who attempted to harm themselves in 2018 and who were reported by the primary data-generating units, information received at the Local Health Secretariat in 2018. A non-probabilistic sampling was carried out, in which 150 people participated voluntarily, 64.67 % of whom identified themselves as women and 35.33 % perceived themselves as men. The age varied from 12 to 29 years, with average and standard deviations that were located at 20.55 and 5.52.

Inclusion criteria: people included in the database of self-harm events for the year 2018, reported by the primary data generating units to the Local Health Secretary between the ages of 12 and 29, and who voluntarily wished to participate in the study.

Exclusion criteria: people included in the database of self-injury events for the year 2018, reported by the primary data-generating units to the Local Health Secretariat at ages other than those between 12 and 29 years of age.

Collection instruments

The instruments used in the study were:

The questionnaire measures sociodemographic characteristics such as age, sex, marital status, level of education, and type of family.

Family APGAR: an instrument designed in 1978, by Smilkstein, is a questionnaire with five questions, which seeks to demonstrate the functional state of the family, functioning as a scale on which the interviewee places his opinion regarding the functioning of the family for some key issues considered markers of the main functions of the family. Measures: Adaptation, Participation, Personal Resource Gradient, Affection, and Resources; It applies to all family members. Score interpretation: normal: 17-20 points; mild dysfunction: 16-13 points; moderate dysfunction: 12-10 points; severe dysfunction: less than or equal to 9. It has a Cronbach's alpha of 0.84 (18).

Hamilton scales: depression (19) and anxiety (20), is a scale, hetero applied, designed to be used in patients previously diagnosed with depression, to quantitatively evaluate the severity of symptoms and assess changes in the depressed patient. It consists of 17 items, each question has between three and five possible answers, with a score of 0-2 or 0-4, respectively. The total score ranges from 0 to 52. Cut-off points: not depressed: 0-7; light/minor depression: 8-13; moderate depression: 14-18; severe depression: 19-22; very severe depression: >23.

Procedure

The proposal was presented to the official of the dimension of social coexistence and mental health of the Local Health Secretariat of Valledupar, once endorsed, the database of people who self-harmed in 2018 was requested, and the data was protected by the researchers, only they had access, telephone calls were made

to establish contact and assess the interest of the people in wanting to participate in the study; Once the list of people who wished to participate was available, home visits were made to sign the informed consent of the adults and the parents and/or caregivers of the minors and the consent of they. Subsequently, the instruments were applied, with the particularity that the family APGAR was applied to the members of the families that live under the same roof as the people who self-harmed, obtaining a general score on the scale for each participant, the other instruments that measure sociodemographic characteristics, anxiety and depression only applied to people who self-harmed.

Subsequently, the information was organized in Excel in a coded manner to protect the data of the participants and their families, to process the data, analyze it and issue the final report.

Data Analysis

First, an exploratory analysis was carried out to verify that there were no transcription errors in the database. In addition, the parametric assumptions of the Pearson correlation coefficient were checked. In this sense, the presence of outliers was inspected at the univariate level through box plots, but also at the multivariate level through robust Mahalanobis distances. The bivariate normality was contrasted using the Mardia test, while the linearity was examined with scatterplots. In this sense, no significant deviations from the assumptions of this technique were found, so it was decided to perform the correlation analysis using the previously mentioned coefficient.

Consequently, quantitative variables were expressed as means and standard deviations, while qualitative sociodemographic characteristics were presented as counts and percentages. Thus, the direct scores obtained from the administration of the scales were described with the mean and the standard deviation, but the corrected scores were illustrated with absolute frequencies and percentages, presenting them in tabular and graphical form. In this regard, it should be clarified that the transformation process from direct to corrected scores was implemented considering the indications contained in the scales of each scale. Likewise, the t-Student

test was used to compare age according to sex, while the Chi-Square test was used to investigate the possible relationship between sex and other sociodemographic characteristics.

On the other hand, the association between family functioning and self-harm behaviors was examined utilizing the Chi-Square test of independence, constructing contingency tables for this purpose. In this regard, Cramér's V index was calculated to determine the magnitude of such association, in addition to running the z-test of proportions to contrast the conditional proportions between columns. To adjust the significance level due to multiple comparisons, the method suggested by Bonferroni was adopted. Finally, the processing and analysis of the data were executed with the statistical package IBM SPSS 26, considering the significance of the results for values less than 0.05.

RESULTS

Sociodemographic characteristics of the participants

The sample included 150 people, 64.67 % (n=97) of whom identified themselves as women and 35.33 % (n=53) perceived themselves as men. Age ranged from 12 to 29 years, with a mean and standard deviation of 20.55 and 5.52 (CV=26.86 %), respectively. Table 1 presents the rest of the sociodemographic characteristics in a general way and ungrouped by sex.

The mean is shown and the standard deviation for age is shown in parentheses. The count is shown and in parentheses the global percentage for the qualitative variables. The t statistic was used to compare the means of age, while the χ^2 statistic was used to contrast the relationship between sex, socioeconomic status, education, and type of self-injury.

Family functioning of the participants

The family functioning scores are illustrated in Table 2, as can be seen, the general values of the scale suggest that the participants exhibit a severe dysfunction in this construct. The average registered in the total instrument, a value that was

Table 1. Sociodemographic characteristics of the participants in general and by sex

Characteristics	Total 150 (100.00)	Men 53 (35.33)	Female 97 (64.67)	t o χ^2 (p)
Age	20.55 (5.52)	22.25 (5.22)	19.62 (5.48)	2.85 (.005)
Socioeconomic				
Stratum 1	100 (66.67)	39 (26.00)	61 (40.67)	1.77 (.432)
Stratum 2	22 (14.67)	6 (4.00)	16 (10.67)	
Stratum 3 or higher	28 (18.67)	8 (5.33)	20 (13.33)	
Academic level				
Primary	14 (9.33)	7 (4.67)	7 (4.67)	1.52 (0.488)
Secondary	111 (74.00)	37 (24.67)	74 (49.33)	
Academic	25 (16.67)	9 (6.00)	16 (10.67)	
Self-harm				
Poisoning	119 (79.33)	40 (26.67)	79 (52.67)	3.08 (0.623)
Sharp weapon injury	16 (10.67)	7 (4.67)	9 (6.00)	
An attempt by hanging or suffocation	13 (8.67)	5 (3.33)	8 (5.33)	
Void launch	1 (0.67)	0 (0.00)	1 (0.67)	
Attempt by firearm	1 (0.67)	1 (0.67)	0 (0.00)	

located at 9.05 (4.05), barely exceeded the upper limit (9.00) established by the scale to classify family functioning in this way. In addition, the analysis of the corrected scores indicates that most people experience this type of situation

with their families. Note that 74.67 % (n=112) fell into this category, while 6.00 (n=9) were associated with moderate dysfunction. Only 10.67 % (n=16) and 8.67 % (n=13) of the sample generated scores that reflected normal functioning or mild dysfunction, respectively.

Table 2. Direct and corrected scores of family functioning are presented in a general way

Variable	Direct scoring	Score corrected according to the scale ^a			
		Normal	Mild	Moderate	Severe
Total Apgar Score	9.05 (4.05)	16 (10.67)	13 (8.67)	9 (6.00)	112 (74.67)

The mean and standard deviation are shown in parentheses for direct scores, while corrected scores are presented as counts and percentages, which are shown in parentheses.

^aThe Apgar scale establishes the following cut-off points: normal functioning, from 17 to 20 points; level dysfunction, from 13 to 16 points; moderate dysfunction, from 10 to 12 points; and severe dysfunction, from 0 to 9 points.

Anxious and depressive symptomatology of the participants

Note that the average anxiety score of young people or adolescents would imply a mild level, while the mean values of depression would be associated with a severe manifestation. This interpretation is derived directly from the scales

proposed in each scale. Delving into the results, it was found that 26.00 % (n=39) of the sample did not show anxiety, while 31.33 % (n=47) showed mild symptoms. In addition, 42.67 % (n=64) indicated that they experienced moderate anxiety, but none of the individuals stated that they felt severe symptoms regarding this variable. Regarding depression, the average obtained after

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the administration of the questionnaire would imply a severe level, which can be verified by viewing the bar chart in Table 3. Note that 74.00 %

(n=111) of the people reported assessments of severe or very severe depression.

Table 3. Direct and corrected scores of the anxious and depressive symptomatology of the participants

Variable	Direct scoring	Score corrected according to the scale ^a				
		Absence	Mild	Moderate	Severe	Very severe
Hamilton: Anxiety	16.43 (4.34)	39 (26.00)	47 (31.33)	64 (42.67)	0 (0.00)	NA
Hamilton: depression	20.85 (3.88)	0 (0.00)	2 (1.33)	37 (24.67)	63 (42.00)	48 (32.00)

The mean and standard deviation are shown in parentheses for direct scores, while corrected scores are presented as counts and percentages, which are shown in parentheses. The Hamilton anxiety test only has four levels of interpretation, which is why NA (not applicable) is shown for the “very severe” level.

^aThe Hamilton test scale establishes the following cut-off points for anxiety: absence, from 0 to 13 points; mild, from 14 to 17 points; moderate, from 18 to 24 points; and severe, from 25 to 30 points. Regarding the Hamilton depression test: absence, from 0 to 7 points; mild, from 8 to 13 points; moderate, from 14 to 18 points; severe, from 19 to 22 points; and very severe, from 23 points onwards.

Family functioning, anxiety, and depression of the participants

The relationship between family functioning and the anxiety and depression symptoms of the participants is shown in Table 4. As can be seen, no statistically significant association was observed

between these constructs. Note that the size of the coefficients is small in both cases and does not imply statistical significance. However, the signs suggest that as family functioning decreases, scores that reflect a worsening of anxious and depressive symptomatology increase.

Table 4. Relationship between family functioning, anxiety, and depression of the participants

Variables	Apgar Family operation	Hamilton Anxiety	Hamilton Depression
Apgar – Family Functioning	NA		
Hamilton – Anxiety	-0.12 0(.882)	NA	
Hamilton–Depression	-0.02 0(.811)	0.35 (<0.001)	NA

The Pearson correlation coefficient is shown, and the respective significance is shown in parentheses. Only correlations below the diagonal are shown. NA: not applicable.

Family functioning and self-harm behaviors of the participants

The association between family functioning and self-harm behaviors is indicated in Table 5. On this occasion, a statistically significant relationship was not identified either ($\chi^2=6.28$, $p=0.240$, $V=0.17$). Note that the percentages within the columns of participants who attempted to intoxicate themselves were equivalent, being 81.25 % (n=13) for those who exhibited normal functioning, 76.92 % (n=10) for those who manifested a mild level of dysfunction, 66.67 % (n=6) for those who reported moderate dysfunction, and 80.36 % (n=90) for individuals who exhibited severe family dysfunction. It is important to remember that these percentages are independent conditional proportions, so it is incorrect to assume that the sum of these amounts must equal 100 %. To broaden this explanation, note that each proportion is obtained by dividing the registered frequency by the subtotal of that category. For example, 13 people tried to intoxicate themselves out of the total of 16 people whose functioning was normal, which represents the 81.25 % previously reported. The rest of the categories can be analyzed in the same way based on Table 5.

The count, the total percentage, and the conditional percentage are displayed according to column (col.). This last percentage is calculated by dividing the count by the subtotal for the corresponding category.

DISCUSSION

The research found that most participants who self-harmed in 2018 had severe dysfunction at the family level, which coincides with studies carried out in the Department of Atlántico, wherein a sample of adolescents with suicidal ideation, found high scores of family dysfunction (8), this allows taking into account the essential role that a family has aimed at supporting and positively linking all its members, in which it can prevent self-injurious behaviors if those family functions that show more support, integration, adaptation in its members; Otherwise, when families do not fulfil their basic functions of promoting care, protection, and psychological

Table 5. Association between family functioning and self-harm behaviors

Type of self-harm	Normal functioning			Mild dysfunction			Moderate dysfunction			Severe dysfunction			χ^2 (p, V)
	n	% Inside of the column.	% Inside of the total	n	% Inside of the column.	% Inside of the total	n	% Inside of the column.	% Inside of the total	n	% Inside of the column.	% Inside of the total	
Poisoning	13	81.25	8.67	10	76.92	6.67	6	66.67	4.00	90	80.36	60.00	6.28
HPAC	1	6.25	0.67	1	7.69	0.67	0	0.00	0.00	14	12.50	9.33	(0.240, 0.17)
Other	2	12.50	1.33	2	15.38	1.33	3	33.33	2.00	8	7.14	5.33	
Total	16	100.00	10.67	13	100.00	8.67	9	100.00	6.00	112	100.00	74.67	

well-being, they can affect the mental health of their members (10-11).

The results of anxious symptomatology indicate that the majority of the participants present moderate and mild anxiety, when evaluating the depressive symptomatology the participants had high scores in the severe, very severe, and moderate levels, which represents a high-risk factor for the behaviors of self-harm; This is related to other studies in which it has been found that self-elimination or self-injury occurs from a multi-causality in which risk factors such as depression, anxiety, substance use, among others, participate, this is how empirical studies show that 90 % of people who commit suicide generally have a mental health problem (3,4).

As a novel aspect of the study, no correlations were found between family functioning, anxiety, and depression of the participants, nor between family functioning and self-harm behaviors of the participants, which could lead to limiting the possibilities of intervention to the biological field, susceptible of pharmacological treatment, of main management from Psychiatry; having a broad consensus that the phenomenon of suicide is multicausal, a comprehensive approach to the problem is necessary from the different scientific disciplines, especially the medical and social sciences. The research findings generate the need to carry out more extensive studies and consider other variables that have not been assessed in depth and could influence self-harm and suicidal behaviors.

REFERENCES

1. Organización Mundial de la Salud. Suicidio: datos y cifras. OMS. 2021. Disponible en: <https://www.who.int/es/news-room/fact-sheets/detail/suicide>
2. Navío M, Pérez V. Depresión y Suicidio. Documento estratégico para la promoción de la Salud Mental. Madrid; Congreso de los Diputados: 2021. Disponible en: https://fepsm.org/files/publicaciones/220217_Libro_Depresion_y_Suicidio_Edicion_Congreso.pdf
3. Martín del Campo E. Suicidio, el reto de adelantarse a una realidad tan compleja como invisible. Gaceta Médica; Madrid: 2019. en: <https://gacetamedica.com/politica/suicidio-el-reto-de-adelantarse-a-una-realidad-tan-compleja-como-invisible-hc2217018/>
4. Dattani S, Ritchie H, Roser, M. Mental Health. Our World in Data: Oxford; 2018. Available in: <https://ourworldindata.org/mental-health>
5. OPS. Pandemia por COVID-19 exacerba los factores de riesgo de suicidio. OPS: Washington; 2020. Disponible en: <https://www.paho.org/es/noticias/10-9-2020-pandemia-por-covid-19-exacerba-factores-riesgo-suicidio>
6. Cudris-Torres L, Barrios-Núñez Álvaro, Bonilla-Cruz NJ. Coronavirus: epidemia emocional y social. Arch Ven Farmacol Ter. 2020;39(3):309-312.
7. Rodríguez-Hernández J, Rocha-Buelvas A, Mendieta-Izquierdo G, Higaldo-Troya A. Riesgo de muerte por suicidio en la población colombiana 2000-2013. Ciência & Saúde Coletiva. 2018;23(11):3989-3996.
8. Núñez-Ariza A, Reyes-Ruiz L, Sánchez-Villegas M, Carmona Alvarado FA, Acosta-López J, Moya-De Las Salas E. Ideación suicida y funcionalidad familiar en adolescentes del caribe colombiano. Arch Ven Farmacol Ter. 2020;39(1):80-87.
9. Chaves-Moreno LF, Montoya-Falla LV, Rodríguez Mayo AG. Asociación entre la funcionalidad familiar y la ideación suicida en estudiantes de psicología de la universidad Santo Tomás, sede Bogotá. Universidad Santo Tomás; Bogotá: 2021. Disponible en: <https://repository.usta.edu.co/bitstream/handle/11634/37380/2021lauramontoya.pdf?sequence=1&isAllowed=y>
10. Niebles J. Asociación de las dimensiones de funcionalidad familiar y práctica de cutting. Universidad de la Costa; Barranquilla: 2019. Disponible en: <https://repositorio.cuc.edu.co/handle/11323/2276>
11. Aguirre C. Aspectos Psicológicos y Familiares que Influyen en las Conductas Autolesivas de Adolescentes del Municipio de Roldanillo-Valle. Universidad Antonio Nariño; Roldanillo: 2020. Disponible en: <http://repositorio.uan.edu.co/bitstream/123456789/2166/1/2020ClaudiaJulianaAguirreHenoa.pdf>
12. Palma-Gómez A, Herrero R, Baños R, García-Palacios A, Castañeiras C, Fernández GL, et al. Efficacy of a self-applied online program to promote resilience and coping skills in university students in four Spanish-speaking countries: study protocol for a randomized controlled trial. BMC Psychiatry. 2020;20:148-160.
13. Cifuentes N. Estudio sobre los factores de riesgo asociados a conductas autolesivas en adolescentes en un Colegio Privado de Bogotá. Universidad Externado de Colombia; Bogotá: 2018. Disponible en: <https://bdigital.uexternado.edu.co/server/api/core/bitstreams/d92b1ea2-a0d1-4047-9c62-76b07a3f5a73/content>
14. DANE. Encuesta Nacional de Uso del Tiempo (ENUT). DANE: Bogotá; 2021. Disponible en: <http://www.dane.gov.co/index.php/estadisticas-por-tema/>

- pobreza-y-condiciones-de-vida/encuesta-nacional-del-uso-del-tiempo-enut
15. Forenses, I. N. Datos para la vida. Instituto Nacional de Medicina Legal y Ciencias Forenses: Bogotá; 2018. Disponible en: <https://www.medicinalegal.gov.co/documents/20143/386932/Forensis+2018.pdf>
 16. SLS. Mesas de prevención, atención y gestión del conocimiento de la conducta suicida. Valledupar. Secretaría Local de Salud: Valledupar. 2018.
 17. SLS. Mesas de prevención, atención y gestión del conocimiento de la conducta suicida. Valledupar. Secretaría Local de Salud: Valledupar. 2021.
 18. Suárez Cuba MA, Alcalá Espinoza M. Apgar Familiar: Una Herramienta Para Detectar Disfunción Familiar. Rev Méd La Paz. 2014;20(1):53-57.
 19. Hamilton M. A rating scale for depression. J Neurol Neurosurg Psych. 2020;23(1):56-62.
 20. Hamilton M. Diagnosis and rating of anxiety. In; Lander MH, editor. Studies of Anxiety. Brit J Psychiat Spec Pub. 1969;3:76-79.

Actitudes sobre las enfermedades infecciosas y contagiosas en población colombiana

Attitudes towards infectious and communicable diseases in the Colombian population

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RESUMEN

Antecedentes: Si bien se ubican investigaciones en el contexto internacional que relacionan y comparan las actitudes ante enfermedades infectocontagiosas, no existen estudios referidos al respecto en el caribe colombiano.

Objetivo: Evaluar las diferencias entre las variables vulnerabilidad percibida a la enfermedad, locus de control de la salud y obsesión-compulsión por la contaminación según el sexo, la edad, el estado civil y el nivel educativo, e identificar posibles relaciones entre estas variables.

Materiales y Método: Estudio descriptivo-correlacional y comparativo, trasversal, con la aplicación del Cuestionario de vulnerabilidad percibida a la enfermedad -PVDQ, la Escala multidimensional de locus de control de la salud (MHLC) y el Inventario de Padua (IP) a 246 personas sanas.

Resultados: Se identificó mayor inafectabilidad percibida, aversión a los gérmenes y percepción de contaminación en mujeres y viudos, así como menor aversión a los gérmenes en personas que declararon vivir en unión libre. Los mayores de 41 años atribuyen en mayor medida su salud a la suerte en comparación con los de menor edad, y quienes presentan menor nivel educativo atribuyen su salud al azar. Viudos refieren mayor preocupación con la contaminación. La percepción de contaminación se asocia con vulnerabilidad percibida a la enfermedad y el locus de control de la salud.

Conclusión: Contar con una pareja estable, alto nivel educativo y locus de control interno alto constituyen factores protectores que deben ser intervenidos para lograr acciones protectoras adecuadas ante la posibilidad de contagio, particularmente ante agentes infecciosos en eventuales pandemias futuras.

Palabras clave: Vulnerabilidad percibida a la enfermedad, locus de control de la salud y percepción de contaminación.

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SUMMARY

Background: Although research is in the international context that relates to and compares attitudes towards infectious-contagious diseases, no studies are referring to this in the Colombian Caribbean.

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Objective: *To evaluate the differences between the variables perceived vulnerability to illness, health locus of control, and obsession-compulsion for pollution according to gender, age, marital status, and educational level, and to identify possible relationships between these variables.*

Materials and Method: *A descriptive-correlational and comparative, cross-sectional study, with the application of the Perceived Vulnerability to Disease Questionnaire -PVDQ, the Multidimensional Health Locus Control Scale (MHLC), and the Padua Inventory (PI) to 246 healthy people.*

Results: *Greater perceived infectability, aversion to germs, and perception of contamination were identified in women and widowers, as well as less aversion to germs in people who declared living in a consensual union. Those over 41 years of age attribute their health to luck to a greater extent compared to younger ones, and those with a lower educational level attribute their health to chance. Widowers report a greater concern with contamination. The perception of contamination is associated with perceived vulnerability to disease and the locus of control of health.*

Conclusion: *Having a stable partner, a high educational level, and a high internal locus of control constitute protective factors that must be intervened to achieve adequate protective actions against the possibility of contagion, particularly against infectious agents in eventual future pandemics.*

Keywords: *Perceived vulnerability to illness, health locus of control, and perceived pollution.*

INTRODUCCIÓN

La vulnerabilidad hace parte de la condición y naturaleza humana (1) y viene del latín “vulnerabilis”, que significa “herida” (vulnus) y “posibilidad” (abilis), la posibilidad de ser herido. La vulnerabilidad hace relación a ser susceptible o estar en riesgo de ser dañado, herido o afectado por un factor externo o interno. En el campo de la salud, la vulnerabilidad al cuerpo hace relación con la enfermedad, la cual puede llegar a afectar todas dimensiones del ser humano, a nivel biopsicosocial y espiritual, llevándole incluso a asumir un nuevo rol en la vida como paciente (2). Es por tanto que, la enfermedad es vista como sinónimo de vulnerabilidad (3).

Ahora bien, la manera de reaccionar ante las enfermedades dependerá de la percepción que tenga la persona sobre la gravedad y las consecuencias de esta y del contexto sociocultural en que se expresen. Es diferente ser diagnosticado

o convivir con alguien con una enfermedad, pues las creencias ante la enfermedad (incluso, si esta es crónica o aguda) guiarán el comportamiento de las personas para optar por un modelo u otro en la dualidad salud-enfermedad (4).

En lo que respecta a enfermedades infecciosas, las personas tienden a sentirse más amenazadas, optando por comportamientos de huida/escape para protegerse, lo que se le denomina “vulnerabilidad percibida a la enfermedad” (VPE). “La vulnerabilidad percibida a la enfermedad funciona como una estrategia adaptativa que explica por qué se evita a los individuos percibidos como fuente de contagio” (5). Según Díaz y col. (5), este constructo hace relación a una susceptibilidad subjetiva a ser infectado (Infectabilidad Percibida) y la sensación de malestar por adquirir gérmenes que causen una enfermedad (Aversión a los gérmenes); las mujeres que reportan más susceptibilidad en estos dos factores (5).

El miedo irracional a enfermar, a ser contaminados o adquirir infecciones o gérmenes, por un agente externo, evitando todo lo que podría generar un “daño” inminente, por la sobrevaloración a la amenaza podría generar ansiedad (6) y este tipo de conductas es asociado además a un subtipo de trastorno obsesivo compulsivo (TOC) llamado TOC de contaminación, el cual también es conocido como misofobia (7).

La misofobia ha sido considerada también como una fobia específica que se caracteriza por un miedo irracional a la contaminación y estándares excesivos sobre la higiene del ambiente y, las personas pueden llegar a desarrollar este trastorno debido en parte, a la atención exagerada por la higiene de manos (8). La misofobia es incluso conocida como verminofobia y germofobia, que es la angustia a los gérmenes y la contaminación, y entre los síntomas está el uso de desinfectantes/antibióticos, evitar los lugares concurridos y el lavado exagerado de las manos, por el miedo a la exposición a los gérmenes (9).

Alrededor de un 2 % de la población mundial padece de por vida TOC, el cual se caracteriza por obsesiones que son pensamientos intrusivos, recurrentes y automáticos que llevan a conductas compulsivas para paliar de manera temporal la ansiedad generada por las obsesiones (10). Los

estudios demuestran una base génica para el desarrollo del TOC, pero hay otros planteamientos que van más allá de la genética y que han sido un poco menos explorados como los eventos vitales estresantes o eventos importantes de la vida que pueden exacerbar en personas sin antecedentes familiares los síntomas del TOC -ej. Conflictos interpersonales, violencia, duelos/pérdidas, enfermedades graves (11).

En épocas de pandemia, especialmente, como la del COVID-19, debido a las políticas de salud pública para aliviar la propagación del virus, los síntomas del TOC y la ansiedad relacionada pueden agudizarse aún más en esta población. La persona puede incrementar más su ritual compulsivo de limpieza/lavado y las obsesiones a ser contaminado por el miedo (12,13). Una revisión de literatura sobre el trastorno obsesivo-compulsivo en tiempos de COVID-19, y de 24 artículos donde no se especificó el tipo de TOC, un 70 % de estos, mostró un efecto negativo del COVID-19 sobre el TOC, además que este hallazgo no distaba de lo encontrado en otras pandemias en el pasado y como hipótesis plantearon que quienes tenían una desmejora en sus síntomas del TOC, eran quienes formaban parte del subtipo de “lavadores”, es decir, tenían obsesiones focalizadas en la contaminación y compulsiones de lavado (14). Por otro lado, un estudio empírico con una muestra de 2 117 participantes de Estados Unidos encontró que los comportamientos de prevención de la contaminación de COVID-19 se asociaron con las obsesiones y fobias a la contaminación (15).

Se ha encontrado que el tener control o la sensación de control ha sido un predictor importante para la explicación de conductas relacionadas con la salud (16). El constructo sobre locus de control (LOC) propuesto por Julian B Rotter en 1954 y como parte de la teoría del aprendizaje social, hace referencia a las creencias que tiene la persona sobre si el resultado de un evento depende de las circunstancias o sus propias acciones. Si la persona tiene un locus de control interno (LoC I) alto, el resultado se concluye por las propias acciones, mientras que un locus de control externo (LoC E) alto, la persona atribuye el resultado más a la fe, la suerte, las condiciones ambientales o las circunstancias sociales. Es por tanto que, el LoC I se relaciona con el bienestar físico y psicológico, mientras que un mayor LoC

E se asocia con una mayor vulnerabilidad a la enfermedad (17).

Los estudios sobre la relación entre el locus de control y los síntomas del TOC no ha sido lo suficientemente robusta (18). En este estudio se encontró que altos niveles de deseo de control y bajos niveles de sensación de control sobre uno mismo y el entorno estaban asociados con altos niveles de creencias y síntomas relacionados con el TOC, y en relación con los síntomas específicos del TOC, las cogniciones de control estaban fuertemente más relacionadas con las obsesiones de contaminación y compulsiones de lavado (18).

Los estudios demuestran además diferencias según el sexo biológico en el inicio temprano del TOC y una variedad en su sintomatología (19,20); en relación con el TOC de contaminación los rituales de lavado y el miedo a la contaminación es más prevalente en las mujeres mientras que en los hombres es más alta la frecuencia de las obsesiones de contaminación (21).

De acuerdo con lo antes planteado y debido a la escasa investigación en el contexto colombiano, este estudio tuvo como preguntas de investigación ¿cuáles son las diferencias según el sexo, la edad, el estado civil y el nivel educativo entre la vulnerabilidad percibida a la enfermedad, el locus de control de la salud y las obsesiones y compulsiones por la contaminación en población adulta de la región caribe colombiana? y ¿Cuáles son las relaciones entre estas variables en la muestra de estudio? Se planteó como hipótesis que los factores de riesgo para mayor vulnerabilidad percibida a la enfermedad y un menor locus de control de la salud y mayor obsesiones y compulsiones por la contaminación era ser mujer, tener mayor edad, vivir solo o sin pareja y tener un bajo nivel educativo y, por otro lado, que quienes tenían una mayor vulnerabilidad percibida a la enfermedad tenían menor locus de control de la salud y mayor obsesiones y compulsiones por la contaminación.

MÉTODO

Participantes

Participaron en este estudio 246 adultos de la región caribe en Colombia entre los 18 y 63 años,

Cuadro 1. Descripción de la muestra.

Género	f	%	Rango de edad	f	%
Hombres	107	43,5	Menores de 40 años	155	63
Mujeres	139	56,5	Mayores de 41 años	91	37
Estado Civil			Educación		
Soltero	73	29,7	Sin estudios	17	6,9
Casado	127	51,6	Primaria	33	13,4
Separado	26	10,6	Bachillerato	104	42,3
Unión libre	4	1,6	Técnico	29	11,8
Viudo	16	6,5	Universitario	63	25,6

quienes fueron escogidos mediante muestreo no aleatorio de sujetos disponibles. La mayoría fueron mujeres, personas casadas, menores de 40 años y con bachillerato completo (Cuadro 1).

Instrumentos

Cuestionario de vulnerabilidad percibida a la enfermedad (*Perceived Vulnerability to Disease Questionnaire*, PVDQ). Desarrollada por Duncan y Schaller (22), versión española de Díaz y col. (5). Evalúa la vulnerabilidad subjetiva a la enfermedad. Cuenta con 15 ítems que se responden en un sistema de respuesta Likert que va de 1 (muy en desacuerdo) a 7 (muy de acuerdo). Comprende dos factores infectabilidad percibida y aversión a los gérmenes.

Escala multidimensional de locus de control de la salud (*The Multidimensional Health Locus of Control Scale*, MHLC). Desarrollada por Wallston y col. (23), versión española de Tomás-Sábado y Montes-Hidalgo (24). Evalúa las creencias sobre las causas de los refuerzos para las conductas relacionadas con la salud. Cuenta con 18 ítems que se responden en un sistema de respuesta Likert que va de 1 (completamente de acuerdo) a 6 (completamente en desacuerdo). Comprende tres factores: 1. *internalidad* que expresa creencias en el sentido de que la salud depende de la propia conducta, 2. *Otras personas relevantes* (incluyendo al médico) y 3. *Suerte/azar* que hacen referencia a creencias en la externalidad, es decir, la salud depende de la

actuación de otras personas competentes y de la suerte.

El Inventario de Padua IP-C (The Padua Inventory, PI). Desarrollada por Sanavio (25), versión española de Ibáñez y col. (26). Evalúa con fines clínicos y de investigación en los trastornos obsesivo-compulsivos. Comprende cuatro factores: Pérdida de control sobre las actividades mentales, Contaminación, Comprobación e impulsos y Preocupación por la pérdida de control sobre la conducta motora. En este estudio solo se empleó el factor de Contaminación de 11 ítems que se responden en un sistema de respuesta Likert que va de 0 (nada en absoluto) a 4 (mucho).

Procedimiento

Este estudio se realizó durante la emergencia sanitaria por COVID-19 decretada por el gobierno colombiano en un período posterior al “lockdown” que implicó un aislamiento total de gran parte de la población colombiana. Por tanto, el estudio se desarrolla considerando todos los protocolos de bioseguridad exigidos por el Gobierno Nacional. Previa explicación sobre los objetivos del estudio a cada uno de los participantes y quienes de manera libre y voluntaria decidieron participar en la investigación se les dio el consentimiento informado para ser firmado. Luego los participantes auto respondieron la batería de cuestionarios. La duración aproximada fue de 15 minutos, y la aplicación de protocolos

psicométricos se llevó a cabo entre enero y mayo de 2022. La investigación es clasificada como “sin riesgo” de acuerdo con el artículo 11 de la Resolución 8430 de 1993, proferida por el Ministerio de Salud de Colombia.

RESULTADOS

A continuación, se presentan los resultados comparativos del estudio de acuerdo con cada criterio sociodemográfico incluido (sexo, la edad, el estado civil y el nivel educativo).

Posteriormente, se muestra la matriz de correlaciones de las variables medidas y los análisis de regresión lineal.

Análisis comparativo

En el Cuadro 2 se presenta las diferencias encontradas según el *sexo*: se identificó en las mujeres mayor infectabilidad percibida y de aversión a los gérmenes del PVDQ y mayor percepción de contaminación del IP-C respecto a los hombres, no encontrándose diferencias significativas en los demás factores medidos.

Cuadro 2. Diferencias de medias por sexo

Sexo	Hombres		Mujeres		U de Mann Whitney	
	Media	D.E.	Media	D.E.	Z	Valor p
PVDQ						
Infectabilidad percibida	3,48	0,96	3,71	1,01	-1,95	0,05
Aversión a los gérmenes	4,09	0,86	4,35	0,86	-2,33	0,02
MHLC						
Salud como condición interna	3,88	1,12	3,97	1,08	-0,89	0,37
Salud debida otras personas	2,73	0,96	3,06	1,26	-1,92	0,06
Salud debida al azar	2,84	1,14	3,13	1,30	-1,84	0,07
IP-C						
Percepción de contaminación	3,04	0,99	3,34	1,02	-2,43	0,02

En el Cuadro 3 se presenta las diferencias encontradas según la *edad*: se identificó de acuerdo con el factor *Salud debida al azar* de la escala MHLC, que las personas mayores de 41 años consideran una mayor tendencia atribuir la salud como producto de la suerte en comparación con los de menor edad. En el resto de las variables no se encontraron diferencias significativas.

En el Cuadro 4 se presenta las diferencias encontradas según el *estado civil*: se identificó según PVDQ que las personas que declaran vivir en unión libre manifiestan menos aversión a los gérmenes respecto a quienes son viudos y separados. Mientras que, según el IP-C, los viudos refieren mayor preocupación con la contaminación, en contraste con las demás modalidades de estado civil reportadas. En cuanto a las demás variables, no se encuentran diferencias significativas.

En el Cuadro 5 se presenta las diferencias encontradas según el *nivel académico*: se identificó según el MHLC que las personas que más creen que la salud es producto de profesionales y personas significativas son los que no refieren estudios, pero es este mismo sector de la muestra el que más tiende a considerar que la salud es producto del azar. Los universitarios y bachilleres son los que menos se identifican con estas creencias. No se identifican otras diferencias significativas en cuanto al nivel académico alcanzado.

Análisis de correlación

El análisis de correlación de Spearman entre las variables psicológicas del estudio donde hubo un nivel de significación entre 0,01 y 0,05 (Cuadro 6).

VINACCIA ALPI S

Cuadro 3. Diferencias de medianas por rango de edad

Rango de edad (años)	Menos de 40		41 en adelante		U de Mann Whitney	
	Media	D.E.	Media	D.E.	Z	Valor p
PVDQ						
Infectabilidad percibida	3,59	1,03	3,65	0,93	-0,49	0,63
Aversión a los gérmenes	4,18	0,83	4,33	0,92	-1,16	0,25
MHLC						
Salud como condición interna	3,82	1,16	4,10	0,96	-1,77	0,08
Salud debida otras personas	2,82	1,17	3,08	1,09	-1,86	0,06
Salud debida al azar	2,85	1,26	3,27	1,15	-2,69	0,01
IP-C						
Percepción de contaminación	3,20	1,06	3,24	0,95	-0,32	0,75

Cuadro 4. Diferencias de medias por estado civil

Variable/Estado Civil	Soltero	Casado	Separado	Unión libre	Viudo	Kruskal-Wallis	Valor p
PVDQ							
Infectabilidad percibida	3,71	3,54	3,42	3,75	3,94	2,53	0,64
Aversión a los gérmenes	4,34	4,11	4,44	3,84	4,56	9,36	0,05
MHLC							
Salud como condición interna	3,90	3,91	4,04	2,92	4,25	5,23	0,27
Salud debida otras personas	2,79	2,97	2,90	3,21	3,02	2,00	0,74
Salud debida al azar	2,87	3,04	2,85	3,08	3,55	4,69	0,32
IP-C							
Percepción de contaminación	3,22	3,07	3,44	3,02	3,96	13,55	0,01

Cuadro 5. Diferencias de medias por nivel académico alcanzado

Variable/Nivel Educativo	Sin estudios	Primaria	Bachillerato	Técnico	Universitario	Kruskal-Wallis	Valor p
PVDQ							
Infectabilidad percibida	3,81	3,68	3,58	3,60	3,57	1,52	0,82
Aversión a los gérmenes	4,07	4,17	4,27	4,44	4,17	2,65	0,62
MHLC							
Salud como condición interna	3,55	3,84	3,85	3,94	4,20	7,53	0,11
Salud debida otras personas	3,51	3,13	2,69	3,20	2,88	12,75	0,01
Salud debida al azar	3,55	3,23	2,82	3,38	2,87	10,34	0,04
IP-C							
Percepción de contaminación	3,07	3,30	3,24	3,41	3,06	4,13	0,39

Según el PVDQ el factor *Infectabilidad percibida* tuvo una correlación negativa con los factores *salud como condición interna* (-0,148*), y con *salud debida otras personas*, (-,349**) y *salud debida al azar* (-0,341**) de la escala MHLC. Mientras que, por otro lado, el factor

aversión a los gérmenes tuvo una correlación negativa con los factores *salud como condición interna* (-0,373**) y *salud debida al azar* (-0,216**) de la escala MHLC.

Según el factor *Percepción de contaminación* del IP-C tuvo una correlación positiva con todos

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los factores del PVDQ como *infectabilidad percibida* (0,494**) y *aversión a los gérmenes* (0,539**) y negativa con todos los factores del

MHLC como *salud como condición interna* (0,304**), *salud debida otras personas*, (0,292**) y *salud debida al azar* (-0,484**).

Cuadro 6. Matriz de correlaciones de las variables medidas

	2	3	4	5	6
PVDQ					
1. Infectabilidad percibida	0,250**	-0,148*	-0,349**	-0,341**	0,494**
2. Aversión a los gérmenes		-0,373**	0,052	0,216**	0,539**
MHLC					
3. Salud como condición interna			0,273**	0,0343**	-0,304**
4. Salud debida otras personas				0,630**	-0,292**
5. Salud debida al azar					-0,484**
IP-C					
6. Percepción de contaminación					

Análisis de regresión lineal

El análisis de regresión lineal demostró que la *aversión a los gérmenes* del PVDQ puede ser predicha con un $R^2 = 0,35$ ($p < 0,05$) por la interacción de las variables *percepción de contaminación* del IP-C (Beta = 0,50, I.C. 95 % = 0,34 - 0,52), *salud como condición interna* (Beta = 0,28, I.C. 95 % = 0,14 - 0,31) y *salud debida otras personas* del MHLC (Beta = -0,21, I.C. 95 % = -0,24 - -0,07).

Por otro lado, el análisis de regresión lineal demostró que la *infectabilidad percibida* del PVDQ puede ser predicha con un $R^2 = 0,27$ ($p < 0,05$) por la interacción de las variables *salud debida otras personas* del MHLC (Beta = 0,43, I.C. 95 % = 0,31 - 0,53) y *percepción de contaminación* del IP-C (Beta = 0,18, I.C. 95 % = 0,06 - 0,26).

DISCUSIÓN

Los participantes de este estudio forman parte de la región caribe colombiana ubicada al norte de este país suramericano, la cual se caracteriza por ser una región marítima con un clima tropical caluroso; su población es la mezcla racial y cultural de los pueblos aborígenes con españoles de diferentes orígenes y de estos con

tribus africanas, y en el último tercio del siglo XIX migraron palestinos, libaneses, sirios, y judíos (sefardíes y asquenazíes) (27). Esta mezcla singular proporciona diferentes referentes étnicos y culturales que matizan la ejecución y justificación a las creencias y prácticas saludables preventivas, ya sea exacerbándolas o suprimiéndolas, con las consecuencias asociadas en la salud integral de las personas.

Según los datos comparativos de este estudio, se encontró que las mujeres muestran mayor vulnerabilidad percibida a contraer alguna enfermedad infecciosa respecto a los hombres y sienten más incomodidad cuando la gente estornuda sin taparse la boca, de tocar objetos que alguien paso por su boca (por ejemplo, morder un lapicero) o usan teléfonos públicos o ropa prestada y llegan en algunos casos hasta lavarse las manos si se la han dado a alguien (aversión a los gérmenes).

De igual manera, las mujeres son las que más obsesiones y compulsiones presentan ante la contaminación (percepción de contaminación IP-C), evitando tocar objetos cuando estos han sido tocado por otros (teléfonos públicos), o cosas sucias (desperdicios), o animales o usar baños públicos, piensan que cualquier contacto con secreciones corporales (respiración, saliva, orina, etc.) pueden contaminar hasta la ropa y generarle un contagio con algún agente patógeno,

y se lavan las manos con mayor frecuencia y dedicación de tiempo para aliviar la sensación de sentirse sucio o contaminado (28). Por otro lado, el haber encontrado que las mujeres presentan más asco a elementos contaminantes que los hombres difiere de lo identificado en España (5), donde no se encontraron diferencias entre hombres y mujeres al asco a los patógenos, posiblemente relacionado por las características culturales mediterráneas de esta muestra que presentan menor distancia interpersonal y mayor contacto físico que muestras poblacionales del norte de Europa (29). Al respecto, el contagio en la cultura colombiana de la costa caribe se podría presentar como un concepto transversal y multidimensional que interconecta dicha sociedad de forma que el riesgo de contagio podría ser visto diferente entre hombres y mujeres (30).

De otro lado, la *aversión a los gérmenes* es más marcada en el grupo de personas que tuvieron pareja en algún momento de sus vidas como los de estado civil viudos y separados en comparación con quienes conviven con una pareja sea en estado de unión libre o casado. Y de igual manera las personas viudas son las más preocupadas por la contaminación (percepción de contaminación IP-C) respecto a personas que viven con su pareja o incluso los solteros. Un estudio desarrollado durante la pandemia del Coronavirus la prevalencia y la vulnerabilidad subjetiva a las enfermedades infecciosas se asocian con una mayor preferencia, conformidad y tradicionalismo del endogrupo y que la evitación de gérmenes de los portadores humanos predicen una ideología conservadora (31).

En relación con el locus de control se encontró en este estudio que las personas de mediana edad y mayores y que no reportan haber estudiado tienden a atribuir la salud a factores más externos que internos ya que perciben por un lado, que la enfermedad es fruto del destino así hagan lo que hagan por su salud y la suerte es determinante para la mejora en la salud y, por otro lado, consideran que una mejoría, o estar igual o peor en su salud dependerá en gran parte del soporte de otras personas y de visitar y seguir las instrucciones del médico.

Numerosos estudios han encontrado que a menor preparación académica se tiende a presentar más locus de control externo, lo cual conlleva a

desarrollar una actitud más conformista sobre el control de los acontecimientos de la propia vida (32). Además, el locus de control externo puede verse como un predictor de enfermedades, en la medida en que las personas están menos dispuestas a asumir las conductas preventivas adecuadas para preservar su salud (33,34). Todo lo anterior lleva a confirmar la primera hipótesis de este estudio donde ser mujer, tener mayor edad, vivir solo o sin pareja y tener un bajo nivel educativo podrían ser factores de riesgo para mayor vulnerabilidad percibida a la enfermedad, mayor obsesiones y compulsiones por la contaminación y un menor locus de control de la salud.

Se identificaron correlaciones negativas y significativas estadísticamente entre el locus de control interno hacia la salud y la vulnerabilidad percibida; así, las personas de este estudio cuando se perciben amenazados por algún virus, germen o enfermedad tienden a asumir una alta responsabilidad por su salud, quizás como mecanismo de protección (35). Más específicamente las obsesiones y compulsiones ante la contaminación (percepción de contaminación IP-C) tuvieron correlaciones negativas altas con la *vulnerabilidad percibida a la enfermedad* (infectabilidad percibida y aversión a los gérmenes) y con locus de control interno hacia la salud (MHLC).

Por su lado, el análisis de regresión lineal muestra que la percepción de ser contaminado y el locus de control interno y externo relacionado con los demás tienen un peso sobre la *aversión a los gérmenes*, mientras que el locus de control externo relacionado con los demás y el percibir ser contaminado tienen un peso sobre la *infectabilidad percibida*. Esto señala que los pensamientos de preocupación acerca de ser contaminado/infectado incrementan al igual que las conductas de evitación como el lavado de las manos y personas y lugares percibidos como sucios, atribuyendo que si llegan a enfermar es por causa de los demás, las circunstancias o los médicos y en caso extremo pueden asumir que es su responsabilidad si llegan a enfermedad, lo que los llevaría a estar en un estado hipervigilante, como mecanismo de protección. Lo anterior confirmaría la segunda hipótesis de este estudio donde quienes tenían una mayor vulnerabilidad percibida a la enfermedad tuvieron menor locus

de control de la salud y mayor obsesiones y compulsiones por la contaminación.

Como limitaciones del estudio las principales tenemos las inherentes a su carácter transversal y tipo de muestreo no aleatorio de sujetos disponibles y que la muestra fue específicamente solo de habitantes de la costa atlántica colombiana y por lo tanto los resultados no son generalizables a muestras poblaciones colombianas de otras regiones geográficas. Es importante señalar además que la continua información presente sobre las variantes de SARS-CoV-2 durante el período de aplicación pudo de alguna forma influenciar los resultados (36).

Se concluye que las mujeres y personas viudas son más susceptibles a la aversión a los gérmenes/infectar, mientras que tener una pareja es un factor amortiguador. Las personas de mediana edad y más edad y con menos estudios tienen un control más externo y supersticioso con respecto a la salud. Y, un locus de control interno es una variable protectora ante la percepción de contaminación. No obstante, es necesario continuar con estudios que validen los resultados expuestos, y que a través de intervenciones multinivel permitan afianzar los factores protectores de conductas saludables preventivas ante agentes infecciosos sin que se afecte la salud mental de las poblaciones.

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Conflicto de Intereses

Los autores declaran que no existe conflicto de intereses en relación con el presente escrito.

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REFERENCIAS

1. Marcos A. Vulnerability as a Part of Human Nature. En: Masferrer A, García-Sánchez E, editors. Human Dignity of the Vulnerable in the Age of Rights. *Ius Gentium: Comparative Perspectives on Law and Justice*. Springer, Cham. 2016;55. Disponible en: https://doi.org/10.1007/978-3-319-32693-1_2
2. Waldow VR. Cuidado humano: la vulnerabilidad del ser enfermo y su dimensión de trascendencia. *Index Enferm*. 2014;23(4):234-238
3. Bluhm R. Vulnerability, health, and illness. *Internat J Femin Approac Bioeth*. 2015;5(2):147-161.
4. Quiceno JM, Vinaccia S. Percepción de Enfermedad: Una Aproximación d partir del Illness Perception Questionnaire. *Psicología desde el Caribe*. 2010;(25):56-83.
5. Díaz A, Soriano JF, Beleña Á. Perceived Vulnerability to Disease Questionnaire: factor structure, psychometric properties and gender differences. *Pers Individ Dif*. 2016;101:42-49.
6. Laforest M, Bouchard S, Créteu AM, Mesly O. Inducing anxiety using a 'contaminated' virtual environment: first steps in the validation of a treatment tool for obsessive-compulsive disorder. *J CyberTherapy and Rehabilitation*. 2011;4(2):290.
7. Belova NA, Koliutskaiia EV. Moral mysophobia phenomenon in schizophrenia. *Zhurnal nevrologii i psikiatrii imeni S.S. Korsakova*, 2012;112(6):13-17.
8. Patnaik NM, Maji S. Psychological Issues and Stress on People in the Purview of COVID-19 Pandemic Lockdown. *Food and Scientific Reports*. 2020;1:36-40.
9. Qadir MI, Yameen IA. Questionnaire-Based Study about Association between Blood Oxygen Level and Mysophobia. *Biomed J Sci Tech*. 2019;14(3):10724-10726.
10. French I, Lyne J. Acute exacerbation of OCD symptoms precipitated by media reports of COVID-19. *Ir J Psychol Med*. 2020;37(4):291-94.
11. Fontenelle LF, Cocchi L, Harrison BJ, Shavitt RG, Conceic do Rosário MC, Ferrão YA, et al. Towards a post-traumatic subtype of obsessive-compulsive disorder. *J Anxiety Disord*. 2012;26(2):377-383.
12. Knowles KA, Olatunji BO. Anxiety and safety behavior usage during the COVID-19 pandemic: The prospective role of contamination fear. *J Anxiety Disord*. 2021;77:102323.
13. Perkes I, Brakoulias V, Lam-Po-Tang J, Castle D, Fontenelle L. Contamination compulsions and obsessive-compulsive disorder during COVID-19.

- Australian New Zealand J Psych. 2020;54(11):1137-1138.
14. Imbali-Vázquez D, Romero-López-Alberca C. Trastorno Obsesivo-Compulsivo en tiempos de la COVID-19: una revisión sistemática. *Escritos Psicol.* 2021;14(2):145-5.
 15. Samuels J, Holingue C, Nestadt PS, Bienvenu OJ, Phan P, Nestadt G. Contamination-related behaviors, obsessions, and compulsions during the COVID-19 pandemic in a United States population sample. *J Psychiatr Res.* 2021;138:155-162.
 16. Boyd JM, Wilcox S. Examining the relationship between health locus of control and God Locus of Health Control: Is God an internal or external source?. *J Health Psychol.* 2020;25(7):931-940.
 17. Gore JS, Griffin DP, McNierney D. Does Internal or External Locus of Control Have a Stronger Link to Mental and Physical Health?. *Psychol Stud.* 2016;61:181-196.
 18. Moulding R, Doron G, Kyrios M, Nedeljkovic M. Desire for control, sense of control and obsessive-compulsive checking: an extension to clinical samples. *J Anxiety Disord.* 2008;22(8):1472-1479.
 19. Mathis MA, Alvarenga PD, Funaro G, Torresan RC, Moraes I, Torres AR, et al. Gender differences in obsessive-compulsive disorder: a literature review. *Braz J Psychiatry.* 2011;33(4):390-399.
 20. Tripathi A, Avasthi A, Grover S, Sharma E, Lakdawala BM, Thirunavukarasu M, et al. Gender differences in obsessive-compulsive disorder: Findings from a multicentric study from India. *Asian J Psychiatr.* 2018;37:3-9.
 21. Lochner C, Hemmings SM, Kinnear CJ, Moolman-Smook JC, Corfield VA, Knowles JA, et al. Gender in obsessive-compulsive disorder: clinical and genetic findings. *Eur Neuropsychopharmacol.* 2004;14(5):437-445.
 22. Duncan LA, Schaller M. Prejudicial attitudes toward older adults may be exaggerated when people feel vulnerable to infectious disease: evidence and implications. *Anal Soc Issues Public Policy.* 2009;9(1):97-115.
 23. Wallston KA, Wallston BS, DeVellis R. Development of the Multidimensional Health Locus of Control (MHLC) Scales. *Health Educ Monogr.* 1978;6(2):160-170.
 24. Tomás-Sábado J, Montes-Hidalgo J. Versión española de la Escala multidimensional de locus de control de la salud en estudiantes de enfermería [Spanish version of the Multidimensional health locus of control scale in nursing students]. *Enferm Clin.* 2016;26(3):181-187.
 25. Sanavio E. Obsessions and compulsions: The Padua Inventory. *Behav Res Ther.* 1988;26(2):169-177.
 26. Ibáñez I, Olmedo E, Peñate W, González M. Obsesiones y compulsiones: estructura del Inventario de Padua. *Internat J Clin Health Psychol.* 2002;2(2):263-288.
 27. Bernal FA. Geografía Humana de Colombia. Bogotá: Fundación Universitaria del Área Andina. 2017. Recuperado de: <https://digitk.areandina.edu.co/bitstream/handle/areandina/1457/Geograf%C3%A9a%20humana%20de%20Colombia.pdf?sequence=1&isAllowed=y>
 28. Olatunji BO, Sawchuk CN. Disgust: Characteristic features, social manifestations, and clinical implications. *J Social Clin Psychol.* 2005;24(7):932-962.
 29. Remland MS, Jones TS, Brinkman H. Interpersonal distance, body orientation, and touch: effects of culture, gender, and age. *J Soc Psychol.* 1995;135(3):281-297.
 30. Caprara A. Cultural interpretations of contagion. *Trop Med Int Health.* 1998;3(12):996-1001.
 31. O'Shea BA, Vitriol JA, Federico CM, Appleby J, Williams AL. Exposure and Aversion to Human Transmissible Diseases Predict Conservative Ideological and Partisan Preferences. *Polit Psychol.* 2022;43(1):65-88.
 32. Ivancevich J, Konopaske R, Matteson M. Comportamiento Organizacional. México: Mc. Graw Hill Interamericana. 2006. Disponible en: https://gc.scalahed.com/recursos/files/r161r/w24903w/Comportamiento%20organizacional_Ivancevich.pdf
 33. Nazareth M, Richards J, Javalkar K, Haberman C, Zhong Y, Rak E, et al. Relating Health Locus of Control to Health Care Use, Adherence, and Transition Readiness Among Youths with Chronic Conditions, North Carolina, 2015. *Prev Chronic Dis.* 2016;13:160046.
 34. Pourhoseinzadeh M, Gheibizadeh M, Moradikalboland M, Bahman C. The Relationship between Health Locus of Control and Health Behaviors in Emergency Medicine Personnel. *Int J Community Based Nurs Midwifery.* 2017;5(4):397-407.
 35. Juanita B, Hardjajani T, Karyanta NA. Hubungan antara Locus of Control Internal dan Dukungan Sosial dengan Ketidakpuasan Bentuk Tubuh pada Wanita Dewasa Awal Anggota Pusat Kebugaran RPM Body Fitness Surakarta. 2015;90:1-14.
 36. Trejos-Herrera AM, Vinaccia S, Bahamón MJ. Coronavirus in Colombia: Stigma and quarantine. *J Glob Health.* 2020;10(2):020372.

Effect of Workload, Work Shift, and Work Stress on Burnout of General Practitioners at Makassar Regional General Hospital during the COVID-19 Pandemic

Efecto de la carga de trabajo, el turno de trabajo y el estrés laboral en el agotamiento de los médicos generales en el Hospital General Regional de Makassar durante la pandemia de COVID-19

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SUMMARY

Objective: This study aimed to analyze the relationship between workload, work shifts, work stress, and work fatigue in general practitioners at Makassar Regional General Hospital.

Method: This research used an analytical observational method with a cross-sectional study design. The sampling method used total sampling on general practitioners at Makassar Regional General Hospital. Workload, work shifts, work stress, and work fatigue were measured using questionnaires.

Results: There were 30 respondents involved in this

study. Most of the respondents were in the 20-30-year age group (73.3 %), female (90 %), working duration <10 years (80 %), and having another one place of practice (40 %). The results of the multivariate statistical test showed an effect of workload ($p=0.001$) and work stress ($p=0.0001$) on the work fatigue of general practitioners at Makassar Regional General Hospital. However, work shift ($p=0.366$) had no effect on general practitioner fatigue at Makassar Regional General Hospital.

Conclusion: Workload and work stress affect the work fatigue of general practitioners in Makassar Regional General Hospital. The most influential factor in work fatigue is work stress.

Keywords: Workload, work shift, work stress, work fatigue.

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RESUMEN

Objetivo: Este estudio tuvo como objetivo analizar la relación entre la carga de trabajo, los turnos de trabajo, el estrés y la fatiga laborales en los médicos generales del Hospital General Regional de Makassar.

Método: Esta investigación utilizó un método observacional analítico con un diseño de estudio transversal. El método de muestreo utilizó muestreo total en médicos generales en el Hospital General Regional de Makassar. La carga de trabajo, los turnos de trabajo, el estrés y la fatiga laborales se midieron mediante cuestionarios.

Resultados: *Hubo 30 encuestados involucrados en este estudio. La mayoría de los encuestados se encontraban en el grupo de edad de 20 a 30 años (73,3 %), mujeres (90 %), antigüedad laboral <10 años (80 %) y con otro lugar de práctica (40 %). Los resultados de la prueba estadística multivariante mostraron un efecto de la carga de trabajo ($p= 0,001$) y el estrés laboral ($p= 0,0001$) sobre la fatiga laboral de los médicos generales en el Hospital General Regional de Makassar. Sin embargo, el trabajo por turnos ($p= 0,366$) no tuvo ningún efecto sobre la fatiga del médico general en el Hospital General Regional de Makassar.*

Conclusión: *La carga de trabajo y el estrés laboral afectan la fatiga laboral de los médicos generales en el Hospital General Regional de Makassar. El factor más influyente en la fatiga laboral es el estrés laboral.*

Palabras clave: *Carga de trabajo, turno de trabajo, estrés laboral, fatiga laboral.*

INTRODUCTION

The current COVID-19 pandemic can worsen various aspects of the work of health workers (increased workload, increased anxiety about being infected with COVID-19, increased stress, and fatigue) (1). COVID-19 has also affected other aspects of healthcare workers to work harder than ever, get tired, stay more sleepless, spend less time with their families, and even live separately from them to prevent families from getting infected with COVID-19. The high risk of infection among health workers in direct contact with COVID-19 patients and the increasing number of health workers infected with COVID-19 make work shifts and workload increase so that health workers in the COVID-19 pandemic are vulnerable to work stress and emotional fatigue (2).

The general practitioner is one of the health workers who are at the forefront of health services in the COVID-19 pandemic. The general practitioner who works in a hospital has a high workload because the emergency room has many emergency cases, and the general practitioner must immediately treat patients quickly. The medical profession bears many responsibilities in handling patients, and general practitioners' physical and mental activity demands make

them vulnerable to experiencing stress and work fatigue (3).

Working amidst intense media and public attention, the long, massive, and possibly unprecedented work duration for some healthcare workers has additional implications in triggering the occurrence of adverse psychological effects, including emotional disturbances, depression, stress, low mood, irritability, panic attacks, phobias, symptoms, insomnia, anger, and emotional exhaustion (4). The stigmatization received and making health workers carriers of the virus is an attitude that can trigger psychological disorders in health workers (5)

Research in Turkey of 442 health workers showed 42 % (182 health workers) experienced stress disorders due to high working hours (6). Research in China by Zhu et al. found that 1 509 out of 5 062 health workers experienced stress during the COVID-19 pandemic, health workers consisting of 243 doctors, 1 130 nurses, and 136 health technicians (7). Research in Iraq by Saeed et al. showed that of 370 doctors working during a pandemic, 15.4 % experienced mild stress, 67.3 % moderate stress, and 17.3 % severe stress (8).

Burnout is a physical, emotional, and mental feeling that occurs because of chronic factors such as pressure and stress at work, and wear and fatigue over time. Emotional exhaustion, a dimension of burnout, is a feeling that emotional resources are exhausted in work done and the psychological inability to work. Özdemir et al. found that work stress positively correlates with emotional fatigue with a value of $r = 0.687$, $p < 0.01$ (2). Prolonged emotional exhaustion can lead to severe mental disorders (9). Emotional fatigue decreases job satisfaction and commitment from health workers (10). Emotional fatigue also causes productivity and performance to decline, and losses due to decreased productivity occur (11). Emotional exhaustion reduces the commitment of health workers to their profession, causing low resignation and patient satisfaction (2).

Based on the evidence this study aimed to analyze the relationship between workload, work shifts, work stress, and work fatigue in general practitioners at Makassar Regional General Hospital.

METHOD

This study is quantitative with a cross-sectional approach. The information collected from respondents used a questionnaire with a general practitioner as the population. The survey method was used to assess the effect of workload, work shift, and work stress on the burnout of general practitioners at Makassar Regional General Hospital.

The population in this study was all general practitioners at Makassar Regional General Hospital, totaling 30 people, consisting of 22 intern doctors and 8 permanent general practitioners. The sampling technique in this study used total sampling. Four variables were measured in this study. Independent variables included workload, work shift, work stress, and work fatigue as the dependent variable.

Data were subjected to the analysis of the correlation of the influence of independent variables on dependent variables, and linear regression analysis of the relationship between workload, work shift, and work stress to burnout. Data were considered significant for a p-value of 0.05.

RESULTS

Of the 30 respondents of general practitioners at Makassar Regional General Hospital, it was found that 22 respondents aged 20-30 years (73.3 %), 4 respondents aged 31-40 years (13.3 %), one respondent aged 41-50 years (3.3 %) and 3 respondents aged >50 years (10 %). There were 3 male respondents (10 %), and 27 female respondents (90 %). 6 people had a working period of ≥ 10 years (20 %) and 24 people were with a working length of <10 years (80 %). Ten people did not have other practice places (33.3 %), 12 people had one other practice place (40 %), and 8 people had 2 other practice places (26.7 %). 14 people were married (46.7 %), and 16 people were unmarried (53.3 %).

Of the 30 respondents in the variable workload measurement, most respondents had a high workload (96.7 %) and those with a very high workload (3.3 %). In the work shift variable,

most respondents have a fairly good work shift quality (70 %), while having poor work shift quality (13.3 %) and good (16.7 %). In the work stress variable, most respondents had normal stress levels (73.3 %), which had mild levels of work stress (13.3 %) and moderate (13.3 %). In the work fatigue variable, most respondents had a low level of fatigue (53.3 %), which had a moderate (43.3 %) and high (3.3 %) level of work fatigue.

Table 1. Analysis of the correlation of the influence of independent variables on dependent variables

Variable	Pearson Correlation	Sig
Workload - burnout	0.559	0.001
Work Shift - burnout	-0.171	0.366
Work stress - burnout	0.605	0.0001

Table 1 showed that: (a) Workload is positively correlated with work fatigue in public docks at Makassar Regional General Hospital ($r=0.559$) where the higher the workload of general practitioners, the higher the perceived work fatigue, the correlation has moderate strength, and statistically significant ($p<0.001$). (b) Work shifts are negatively correlated and very weak with work fatigue in general practitioners at Makassar Regional General Hospital ($r=-0.171$), the correlation is not statistically significant ($p<0.366$). (c) Work stress is positively correlated with work fatigue in general practitioners at Makassar Regional General Hospital ($r=0.605$) where the higher the work stress of general practitioners, the higher the perceived work fatigue, the correlation has strong strength and is statistically significant ($p<0.0001$).

Table 2. Linear regression analysis of the relationship between workload, work shift, and work stress to burnout

Variable	Standardized coefficients beta	Sig	R
Square			
Workload	0.434	0.004	0.547
Work Shift	-0.112	0.410	
Work stress	0.472	0.002	

From the results of regression analysis of the variables workload, work shift, and work stress on work fatigue, the significance value of the variables workload $p= 0.004$ and work stress $p= 0.002$, which indicates that the variables workload and work stress have a significant effect on work fatigue. The work shift variable has a non-significance value of $p= 0.410$ greater than 0.05. These results conclude that variable work shift does not have a significant effect on work fatigue. The magnitude of the R Square value is 0.547 shows that the contribution of the influence of workload, work shift, and work stress on work fatigue is 54.7 % while the remaining 45.3 % is the contribution of other variables that were not included in the study. These results also show that of the three independent variables, the most influential on work fatigue is work stress, because it has the highest beta value, which is 0.472.

DISCUSSION

The effect of workload on general practitioner fatigue at Makassar Regional General Hospital

Due to the COVID-19 pandemic, health workers are faced with heavy workload pressure, the source of the workload faced by doctors is increased working hours, poor sleep quality, and the risk of being infected with the virus and can transmit the virus to family members. The increased workload during the COVID-19 pandemic can cause burnout for healthcare workers (12). In addition, there is an increased mental burden on health workers caused by the increased risk of exposure, infection, and the possibility of infecting their loved ones is also a burden in itself. Many doctors have to isolate themselves from family and loved ones even if they do not have COVID-19, this is a difficult decision and can cause a significant psychological burden on them (13). Even with the use of complete Personal protective equipment (PPE), it can still contract the coronavirus through droplets or aerosols from patients in the air and enter through gaps formed accidentally by health workers when justifying positions, starting positions, wiping sweat, or when removing protective clothing (5). The use of complete PPE

for a long time and the many procedures carried out using PPE are one of the causes of fatigue in health workers (14).

When assess the effect of workload on the work fatigue of general practitioners at Makassar City Hospital, the correlation test showed that workload was positively correlated with work fatigue ($r=0.559$) where the higher the workload of general practitioners, the higher the perceived work fatigue, the correlation was of moderate strength, and statistically significant ($p<0.001$). In linear regression analysis, the workload variable had a significance value of $p<0.004$, which indicates that the workload variable has a significant effect on work fatigue. This study shows that the average workload score for general practitioners at Makassar Regional General Hospital is 71.5 ± 6.75 , which means that the average score falls into the high category, this is in accordance with Shoja et al., who assessed the workload of health workers in Iran during the COVID-19 pandemic, and found that the average workload score for doctors was 56.35 ± 20.45 , which means that the average is also included in the high category (15). Excessive workload (e.g. long working hours, frequent night tasks, and high work intensity), work-home conflict, loss of support from colleagues, and decreased control, autonomy, and meaning in the workplace have each been linked to burnout among clinicians (16).

The effect of work shift on general practitioner fatigue at Makassar Regional General Hospital

The duration of longitudinal shifts often occurs in the practice of medicine. Extended shifts are when doctors are required to work continuously for more than 8 hours, with little or no rest, and often indefinitely. Research on elongated shifts in doctors has the impact of fatigue, increasing the risk of harm to patients and doctors themselves. This elongated shift is partly due to the lack of doctors working at the hospital (17). The shortage of doctors was found during the COVID-19 pandemic, and the increasing number of patients in hospitals made them overwhelmed and more vulnerable to being infected with COVID-19. Like other people, if doctors are infected with COVID-19, they are also required to self-isolate

for 10 days. This certainly makes shifts for other doctors in the same hospital increase in terms of duration and frequency.

Based on the results of the study, the distribution of respondents according to the quality of work shifts found that 70 % of general practitioners at Makassar Regional General Hospital rated the quality of work shifts as quite good, 16.7 % rated the quality as good and 13.3 % rated the quality of shifts as bad during the COVID-19 pandemic. The correlation test showed that work shift was negatively correlated and very weak with work fatigue in general practitioners at Makassar Regional General Hospital ($r=-0.171$), the correlation was not statistically significant ($p=0.366$). In multivariate analysis, the significance value of the work shifts variable was $p=0.41$. Thus, work shift variables do not have a significant effect on work fatigue. This is because most general practitioners at Makassar Regional General Hospital assess the quality of their work shifts as good enough so that work shift has less effect in causing work fatigue. In a study poor shift quality, such as an increase in the number of shift frequencies, lengthening shifts, and night shift frequencies played a role in causing physician fatigue (18). Elongated shifts make doctors tired quickly, because of lack of rest and a doctor's work where he must focus all the time on treating patients, performing medical procedures, and documenting the results of examinations and therapies given.

The effect of work stress on general practitioner fatigue at Makassar Regional General Hospital

Work stress is a state of tension that creates physical and psychological imbalances that affect the emotions, thought processes, and conditions of a worker. This stress is a demand to be able to adjust to the demands that take place. Claims of bias are current (factual) events and can also be things that may happen in the future but are perceived factually. Stressors are demands for conformity. Stress has a characteristic synonymous with behavior adapting to the environment, including things outside the self (outer world) and in the self (inner world) (19,20). The COVID-19 pandemic exposes health workers to many stressors that can increase work stress in

health workers. In handling COVID-19 patients, many physical difficulties are faced, such as prolonged use of PPE and carrying out medical procedures while using full PPE, mental and emotional difficulties such as fear of the risk of exposure to and infection with COVID-19, and increased workload (2).

Research on work stress in doctors during the COVID-19 pandemic found that around 75 % of doctors studied experienced moderate stress, many things that cause stress to doctors, such as fear of being beaten by the patient's family for no reason, fear of infection, not seeing family and friends, fear of infecting family, quarantine for 14 days after the assignment in special COVID-19 care and administrative pressure (21). The correlation test shows that work stress is positively correlated with work fatigue in general practitioners at Makassar Regional General Hospital ($r=0.605$) where the higher the work stress of general practitioners, the higher the perceived work fatigue, the correlation has strong strength and statistically significant ($p<0.0001$). In linear regression analysis, the work stress variable has a significance value of $p<0.002$, which indicates that the work stress variable has a significant effect on work fatigue. Health workers expend a lot of effort and energy in dealing with this work stress so that they can still handle patients professionally and carry out their duties. This can lead to emotional exhaustion (22). Özdemir et al. determined the levels of optimism, stress, and emotional exhaustion of healthcare workers related to COVID-19 and the effect of optimism directly and indirectly through job stress on emotional exhaustion caused by COVID-19. They conclude that the pandemic caused emotional exhaustion, one of these psychological effects. Also, it was determined a relationship between work stress and emotional fatigue, with a statistically significant relationship between the two ($r=0.846$, $p<0.01$), with a multivariate test of $b=0.687$, $p<0.01$ (2). Emotional exhaustion is essential for both the private and business life of employees in the health sector, as in other sectors; it creates many negative results both individually and organizationally, and it increases the intentions of healthcare workers to leave the job. Therefore, health organizations should identify and implement practices that will reduce employee emotional exhaustion; it

is particularly important to take the necessary precautions to minimize emotional exhaustion, especially during this pandemic, where the emotional exhaustion level is high (2).

CONCLUSION

There is a significant influence between workload and work stress on work fatigue in general practitioners at Makassar Regional General Hospital during the COVID-19 pandemic. While in work shift, there was no significant effect on work fatigue.

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Authors' Contributions

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Conflict of Interest

The author(s) declared no potential conflicts of interest concerning this article's research authorship and/or publication.

Availability of Data and Materials

All data generated or analyzed during this study are included in this published article.

REFERENCES

- Al Barmawi MA, Subih M, Salameh O, Sayyah Yousef Sayyah N, Shoqirat N, Abdel-Azeez Eid Abu Jebbeh R. Coping strategies as moderating factors to compassion fatigue among critical care nurses. *Brain Behav.* 2019;9(4):1-8.
- Özdemir Ş, Kerse G. The effects of the COVID-19 process on health care workers: Analysing of the relationships between optimism, job stress, and emotional exhaustion. *Int Multidiscip J Soc Sci.* 2020;9(2):178-201.
- Suharni, Samsualam, Kurnaesih E. Determinant Implementation for Living Baby and Children Health Program in the Makassar City. *Indian J Public Heal Res Dev.* 2017;8(4).
- Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet.* 2020;395(10227):912-920.
- Handayani RT, Kuntari S, Darmayanti AT, Widiyanto A, Atmojo JT. Factors Causing Stress in Health Workers and the Community During a Pandemic COVID-19. *J Keperawatan Jiwa.* 2020;8(3):353-360.
- Elbay RY, Kurtuluş A, Arpacioğlu S, Karadere E. Depression, anxiety, stress levels of physicians and associated factors in COVID-19 pandemics. *Psychiatry Res.* 2020;290(May):1-5.
- Zhu Z, Xu S, Wang H, Liu Z, Wu J, Li G, et al. COVID-19 in Wuhan: Immediate Psychological Impact on 5062 Health Workers. 2020;(1095).
- Saeed BA, Shabila NP, Aziz AJ. Stress and anxiety among physicians during the COVID-19 outbreak in the Iraqi Kurdistan Region: An online survey. *PLoS One.* 2021;16(6):1-15.
- Tuithof M, ten Have M, Beekman A, van Dorsselaer S, Kleinjan M, Schaufeli W, et al. The interplay between emotional exhaustion, common mental disorders, functioning and health care use in the working population. *J Psychosom Res.* 2017;100(March):8-14.
- Dishop CR, Green AE, Torres E, Aarons GA. Predicting Turnover: The Moderating Effect of Functional Climates on Emotional Exhaustion and Work Attitudes. *Community Ment Health J.* 2019;55(5):733-741.
- Chen H, Richard OC, Dorian Boncoeur O, Ford DL. Work engagement, emotional exhaustion, and counterproductive work behavior. *J Bus Res.* 2020;114(March):30-41.
- Patel RS, Bachu R, Adikey A, Malik M, Shah M. Factors related to physician burnout and its consequences: A review. *Behav Sci (Basel).* 2018;8(11).
- Kang L, Li Y, Hu S, Chen M, Yang C, Yang BX, et al. The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psych.* 2020;7(3):e14.
- Patmawati TA, Woge Y, Rif'atunnisa R, Secunda MS, Amir H. Analysis of Factors Associated with Patient

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- Safety Incident Reporting Culture among Nurses. *Jurnal Keperawatan*. 2022; 14(2) :465–472.
15. Shoja E, Aghamohammadi V, Bazyar H, Moghaddam HR, Nasiri K, Dashti M, et al. COVID-19 affects the workload of Iranian healthcare workers. *BMC Public Health*. 2020;20(1):1-7.
 16. West CP, Dyrbye LN, Shanafelt TD. Physician burnout: contributors, consequences and solutions. *J Intern Med*. 2018;283(6):516-529.
 17. Kotze K, van der Westhuizen HM, van Loggerenberg E, Jawitz F, Ehrlich R. Doctors' extended shifts as risk to practitioner and patient: South Africa as a case study. *Int J Environ Res Public Health*. 2020;17(16):1-10.
 18. Hidayah N, Kristan K, Supu NM, Latif AI, Amir H. Telehealth Model in Improving Health Service during COVID-19 Pandemic. *Gac Méd Caracas* 2022;130(4):873-878.
 19. Wintoro AY, Dwiputri RR, Yuniarti S, Iskandarsyah A. Get to Know Closer: Occupational Stress on Internship Doctors. *J Psychol Sci Prof*. 2018;2(1):67.
 20. Suharni. Antidepressant Adherence Among Hispanics: Patients in an Integrated Health Care Model [Letter]. *J Multidiscip Healthc*. 2023;16.
 21. Mansi Dwivedi SP. Stress among doctors during COVID-19. *Int J Indian Psychology*. 2020;8(2).
 22. Sultana A, Sharma R, Hossain MM, Bhattacharya S, Purohit N. Burnout among healthcare providers during COVID-19: Challenges and evidence-based interventions. *Indian J Med Ethics*. 2020;V(4):1-6.

Trastorno por uso de videojuegos y comportamiento agresivo en adolescentes de educación secundaria: Un estudio transversal en Perú

Gaming disorder and aggressive behavior in adolescents of regular basic education: A cross-sectional study in Peru

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RESUMEN

Introducción: Los videojuegos son en la actualidad una de las formas de entretenimiento más populares, especialmente entre los adolescentes y jóvenes, sin embargo, su uso excesivo y compulsivo podría provocar una serie de problemas que afectarían su bienestar personal y calidad de vida.

Objetivo: Determinar si el trastorno por uso de videojuegos se relaciona de manera significativa con el comportamiento agresivo de los adolescentes de educación secundaria de la Amazonía peruana.

Métodos: El enfoque fue cuantitativo, el diseño no experimental y el tipo descriptivo-correlacional de corte transversal. La muestra fue conformada por 264 estudiantes a quienes se les aplicó la prueba de

Dependencia de Videojuegos y el Cuestionario de Agresión, instrumentos con adecuados niveles de validez basada en el contenido y confiabilidad.

Resultados: Se determinó que el trastorno por uso de videojuegos se relacionaba de manera directa y significativa con el comportamiento agresivo ($r=0,484$; $p<0,05$). Asimismo, se halló que el trastorno por uso de videojuegos también se relacionaba de manera directa y significativa con las dimensiones agresividad física ($r=0,502$; $p<0,05$); agresividad verbal ($r=0,447$; $p<0,05$); ira ($r=0,463$; $p<0,05$) y hostilidad ($r=0,477$; $p<0,05$).

Conclusión: Existe una relación directa y significativa entre el trastorno por uso de videojuegos y el comportamiento agresivo de los adolescentes de educación secundaria de la Amazonía peruana. Por ello, es necesario orientar a los padres de familia para que limiten el tiempo en el que los adolescentes permanecen conectados a los videojuegos y eviten que jueguen videojuegos violentos o poco apropiados para sus edades.

Palabras clave: Trastorno por uso de videojuegos, agresividad, adolescencia, educación secundaria, estudiantes.

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SUMMARY

Introduction: Videogames are currently one of the most popular forms of entertainment, especially among adolescents and young people, however, their excessive and compulsive use could cause a series of problems

that would affect their well-being and quality of life.

Objective: *To determine if gaming disorder is significantly related to aggressive behavior in secondary school adolescents from the Peruvian Amazon.*

Methods: *The approach was quantitative, with a non-experimental design and the descriptive-correlational type of cross-section. The sample was made up of 264 students who were given the Test of Dependence of Videogames and the Aggression Questionnaire, instruments with adequate levels of validity based on content and reliability.*

Results: *Gaming disorder was found to be directly and significantly related to aggressive behavior ($r=0.484$; $p<0.05$). Likewise, it was found that video game use disorder was also directly and significantly related to the physical aggression dimensions ($r=0.502$; $p<0.05$); verbal aggression ($r=0.447$; $p<0.05$); anger ($r=0.463$; $p<0.05$) and hostility ($r=0.477$; $p<0.05$).*

Conclusion: *There is a direct and significant relationship between gaming disorder and aggressive behavior in secondary school adolescents from the Peruvian Amazon. Therefore, it is necessary to guide parents so that they limit the time in which adolescents remain connected to video games and prevent them from playing violent or inappropriate video games for their ages.*

Keywords: *Gaming disorder, aggressiveness, adolescence, secondary education, students.*

INTRODUCCIÓN

Los videojuegos se han convertido en una actividad de ocio popular y de rápido crecimiento en todo el mundo, con un número estimado de jugadores en 2020 de alrededor de 2 700 millones de personas (1). Debido a su preferencia, particularmente entre los adolescentes y jóvenes (2), han surgido preocupaciones con respecto a los comportamientos patológicos asociados a su uso (3), lo que llevó a la Asociación Estadounidense de Psiquiatría (APA) a incluir el trastorno por uso de videojuegos (TUV) dentro de la Sección III de la quinta revisión del Manual de Diagnóstico y Estadística de los Trastornos Mentales (DSM-5) como un trastorno emergente que requiere más investigación (4). Posteriormente, la Organización Mundial de la Salud (OMS) decidió incluirlo oficialmente como una condición de salud mental dentro de la última revisión de la Clasificación Internacional de Enfermedades (CIE-11) (5).

El TUV se define como un patrón de comportamiento de juego negativo caracterizado por la pérdida de control sobre el juego y el tiempo total dedicado a jugarlo, lo que da como resultado que se posterguen otros intereses y actividades diarias. Incluso, si hay consecuencias negativas, el usuario continuará jugando (6). También ha sido asociado con varios problemas de salud mental y perjuicios psicosociales, como aumento del estrés, aumento de la obesidad, reducción del desempeño, disminución del rendimiento académico, anomalías del sueño, problemas de socialización, depresión, menor bienestar psicosocial, irritabilidad y ansiedad (7).

Desde el punto de vista de las neurociencias, se sostiene que existen actividades cerebrales comunes entre el TUV (que pertenecen al grupo de adicciones conductuales) y los trastornos por uso de sustancias. En ese sentido, se ha demostrado que la corteza prefrontal dorsolateral, la corteza frontal orbital, la circunvolución parahipocámpal y el tálamo se activan en las personas que padecen de dichos trastornos (8). Además, se ha observado que el nivel de dopamina liberado en el cuerpo estriado ventral al jugar un videojuego es comparable al que provocan las drogas psicoestimulantes (9).

Existen nueve criterios de diagnóstico para el TUV y se cree que cumplir con cinco de los nueve criterios en el transcurso de los últimos 12 meses justifican su diagnóstico (10). Esos nueve criterios son: (1) estar completamente enfocado en los videojuegos; (2) al detener el videojuego tener síntomas como ansiedad e irritabilidad; (3) aumentar gradualmente el tiempo dedicado a los videojuegos; (4) no poder reducir la cantidad de tiempo destinada a los videojuegos; (5) abandonar otras actividades y perder el interés en otros pasatiempos; (6) seguir jugando, incluso cuando se sabe que los videojuegos tienen un impacto negativo en la vida; (7) no dar a conocer la cantidad de tiempo destinado a los videojuegos a los miembros de la familia u otras personas; (8) sentir emociones negativas mitigadoras tales como culpa, desesperación, etc., debido a los videojuegos; y (9) no cumplir con las responsabilidades académicas o domésticas debido a los videojuegos.

Para prevenir que los adolescentes padezcan del TUV es necesario que los padres de familia

limiten el contenido y el tiempo que los adolescentes destinan a los videojuegos, que las compañías de videojuegos publiquen información de advertencia relacionada con los riesgos de jugar en exceso y deben diseñarse políticas para brindar ayuda y tratamientos adecuados a los adolescentes que estén en riesgo o tengan dependencia a los videojuegos (11).

Según el modelo teórico tetrafactorial, el TUV está conformado por cuatro dimensiones: la abstinencia, el abuso y la tolerancia, los problemas ocasionados por los videojuegos y la dificultad en el control (12,36). La abstinencia se refiere al malestar que evidencian las personas cuando no pueden acceder a los videojuegos y su utilización para sobrellevar estados emocionales adversos; el abuso y la tolerancia se asocian al incremento progresivo de las horas destinadas a los videojuegos; los problemas ocasionados por los videojuegos se refieren a las secuelas negativas que ocasionan los videojuegos en su bienestar personal; y la dificultad para el control tiene que ver con la dificultad para dejar de jugar a pesar de conocer que dicha práctica en exceso es perjudicial.

Respecto al comportamiento agresivo (CA), la adolescencia es un período de cambio para los dominios sociales y de desarrollo que puede ir acompañado de problemas, como el CA, el cual puede constituir una preocupación para la salud de los adolescentes y se considera una respuesta conductual y emocional que puede ser angustiada para los demás (13). Fue definido como aquel comportamiento que tiene como intención herir o lastimar a alguien, ya sea física o psicológicamente (14). Se considera que es el resultado de una interacción compleja entre variables personales, interpersonales y circunstanciales (15). La característica definitoria del comportamiento agresivo es la intención de causar daño a otra persona, pero la forma que adopta puede ser directa, como una confrontación física con la víctima, o indirecta, a menudo denominada CA relacional (16).

La evidencia muestra que los estudiantes con rasgos de agresividad en el entorno escolar corren el riesgo de tener fracaso académico, inadaptación social y conductas negativas e incorrectas de por vida (17). Además, se informa que el CA está relacionado con varios resultados negativos en

la edad adulta, incluido el bajo desempeño, el aislamiento social, diversos problemas sociales y problemas de salud física (18).

De acuerdo con el modelo general de agresión, el CA está fuertemente influenciado por las estructuras de conocimiento, que afectan a una amplia variedad de fenómenos sociocognitivos que incluyen la percepción, la interpretación, la decisión y los comportamientos (19). Entonces, algunas de las estructuras de conocimiento más importantes incluyen creencias y actitudes (creer que el CA es normal o evaluarlo positivamente), esquemas de percepción (percibir eventos ambiguos como hostiles), esquemas de expectativas (esperar la agresión de otros) y guiones conductuales (creer que los conflictos deben resolverse con el CA) (20). Estas estructuras de conocimiento se desarrollan a través de la experiencia y pueden influir en la percepción en múltiples niveles, desde la percepción simple de objetos hasta la percepción compleja de eventos sociales (21).

Ahora bien, uno de los grandes problemas asociados al CA en las instituciones educativas es su normalización (22), es decir, pensar que la conducta que lo promueve es normal entre el estudiantado (23). Esta situación debe ser manejada con cautela, puesto que los estudiantes que evidencian frecuentemente el CA suelen tener dificultad para autorregular sus emociones, son impulsivos, indiferentes, evidencian respuestas emocionales sobredimensionadas, lo que origina que tengan pésimas relaciones interpersonales (24).

De acuerdo con el modelo teórico de Buss (25), el comportamiento agresivo presenta 4 dimensiones: agresividad física, agresividad verbal, ira y hostilidad. La agresividad física consiste en atacar a otra persona haciendo uso de las partes del cuerpo o de algún arma u objeto para obtener, mantener o defender un objeto o actitud que se desea. Respecto a la agresividad verbal, se refiere a la descarga emocional a través de una respuesta vocal, como el desprecio, la amenaza o el rechazo. En cuanto a la ira, está asociada a una serie de sentimientos que aparecen a partir de reacciones psicológicas internas y de las expresiones emocionales involuntarias luego de un acontecimiento desagradable. En relación con la hostilidad, está referida a la percepción

negativa que se tiene de las personas junto a un deseo de causarles daño.

Existen investigaciones que analizaron la relación entre el TUV y el CA en adolescentes, sin embargo, los resultados no son concluyentes (26). En ese sentido, algunas investigaciones reportaron que existía una relación directa y significativa entre ambas variables (27-32). Por otro lado, en otras investigaciones no se reportaron relaciones significativas (3,33,34).

Por lo anterior, el objetivo de la presente investigación fue determinar si el TUV se relaciona de manera significativa con el CA de los adolescentes de educación secundaria de la Amazonía peruana.

MÉTODO

El enfoque de investigación fue cuantitativo, debido a que se basó en la medición numérica, así como la utilización de la estadística para determinar los patrones de comportamiento de los participantes. Respecto al diseño, fue no

experimental, puesto que las variables TUV y CA no fueron manipuladas de manera intencional, solo se observaron. En cuanto al tipo, fue descriptivo – correlacional de corte transversal, ya que se desarrolló el análisis de las características de las variables, se determinó si ambas se relacionaban de manera significativa y debido a que el proceso de recolección de datos fue realizado en un solo momento, respectivamente (35).

La población fue conformada por 845 adolescentes que cursaban el tercer, cuarto y quinto grado de educación secundaria pertenecientes a cinco instituciones educativas públicas de la Amazonía peruana, mientras que la muestra fue conformada por 264 estudiantes, cantidad que se determinó a través del muestreo probabilístico con un nivel de confianza del 95 % y un nivel de significancia del 5 %. Como se observa en el Cuadro 1, participaron más estudiantes mujeres, tenían entre 15 y 16 años, cursaban el cuarto grado de secundaria, destinaban hasta 2 horas al día a jugar videojuegos y accedían a ellos mediante sus celulares.

Cuadro 1

Características sociodemográficas de la muestra

VARIABLES	Características sociodemográficas	n= 264	%
Género	Masculino	177	67,1
	Femenino	87	32,9
Edad	Entre 13 y 14 años	79	29,9
	Entre 15 y 16 años	100	37,9
	Entre 17 y 18 años	85	32,2
Grado	Tercero	82	31,1
	Cuarto	93	35,2
	Quinto	89	33,7
Horas diarias destinadas a los videojuegos	Hasta 2 horas	184	69,7
	Entre 3 y 4 horas	51	19,3
	Más de 4 horas	29	11,0
Dispositivo en el que accede a los videojuegos	Celular	146	55,3
	Consola	41	15,5
	Computadora	77	29,2

Para la recolección de datos se elaboró una encuesta, la cual estuvo estructurada en tres secciones. En la primera sección se solicitó a los adolescentes información sociodemográfica (género, edad, grado, horas diarias destinadas a los videojuegos y dispositivos en el que accedían a ellos).

En la segunda sección se aplicó la prueba de Dependencia de Videojuegos, la cual fue elaborado por Chóliz y Marco (36) y adaptado a la realidad peruana por Salas y col. (37). La mencionada prueba está conformada por 25 ítems calificados cuantitativamente mediante una escala de Likert de 5 puntos que transcurren desde 1 (nunca) hasta 5 (siempre) y se distribuyen en 4 dimensiones: abstinencia (ítems del 1 al 10), abuso y tolerancia (ítems del 11 al 15), problemas ocasionados por los videojuegos (ítems del 16 al 19) y dificultad en el control (ítems del 20 al 25). Sus propiedades psicométricas fueron determinadas en un estudio previo realizado en Perú (38), donde se estableció que la prueba tenía un adecuado nivel de validez basada en el contenido (V de Aiken= 0,898) y confiabilidad (α = 0,838).

En la tercera sección se aplicó el Cuestionario de Agresión, el cual fue elaborado por Buss y Perry (39) y adaptado al contexto peruano por Matalinares y col. (40). Consta de 29 ítems calificados cuantitativamente mediante una escala de Likert de 5 puntos que transcurren desde 1 (nunca) hasta 5 (siempre) y se distribuyen en 4 dimensiones: agresividad física (ítems del 1 al 9), agresividad verbal (ítems del 10 al 14), ira (ítems del 15 al 21) y hostilidad (ítems del 22 al 29). Sus propiedades psicométricas también fueron determinadas en un estudio previo realizado en Perú (41), donde se estableció que la prueba tenía un adecuado nivel de validez basada en el contenido (V de Aiken= 0,874) y confiabilidad (α = 0,940).

Para la recolección de datos se gestionaron las autorizaciones a los equipos directivos de las instituciones educativas focalizadas en la presente investigación. Después, se contactó a los padres de familia mediante *Whatsapp* para precisarles el propósito de la investigación y solicitarles el consentimiento para que sus hijos participen. Luego, una vez que se obtuvo el consentimiento informado, se aplicaron los

instrumentos de manera presencial, actividad que tuvo una duración aproximada de 30 minutos. Por último, se creó una base de datos con las respuestas de los estudiantes.

El análisis de datos se realizó a nivel descriptivo e inferencial. El análisis descriptivo se desarrolló mediante el uso de tablas de frecuencia y porcentaje que fueron obtenidos utilizando el Software SPSS V.25. En cuanto a los resultados inferenciales, se obtuvieron mediante el uso del coeficiente de correlación r de Pearson. Este estadístico fue importante para conocer si las variables y dimensiones se relacionaban significativamente ($p < 0,05$). Complementariamente, se realizó la regresión lineal para ver si el TUV predecía el CA de los estudiantes.

RESULTADOS

De acuerdo con el Cuadro 2, el nivel del TUV del 42,8 % de estudiantes fue bajo, del 37,5 % fue moderado y del 19,7 % fue alto. La información descrita indica que los estudiantes se caracterizaban por tener un patrón de comportamiento hacía los juegos en línea o fuera de línea poco recurrente, es decir, accedían a los videojuegos sin descuidar sus responsabilidades y actividades diarias. No obstante, no se debe perder de vista que más de la tercera parte del total de estudiantes tenían un deficiente control de su comportamiento al momento de jugar los videojuegos, situación que indica que ellos priorizaban dicha práctica por encima de otras actividades, dejando de lado sus responsabilidades aun cuando saben las consecuencias negativas que podría ocasionarles.

En lo que respecta a las dimensiones, la abstinencia (41,7 %), el abuso y tolerancia (47,3 %) y la dificultad en el control (46,6 %) se ubicaron en el nivel bajo, sin embargo, la dimensión problemas ocasionados por los videojuegos se ubicó en el nivel moderado (41,7 %).

En el Cuadro 3 se observa que el nivel del CA del 42,8 % de estudiantes fue bajo, del 37,1 % fue moderado y del 21,2 % fue alto. El hallazgo descrito quiere decir que pocas veces tenían la disposición o comportamientos orientados a

TRASTORNO POR USO DE VIDEOJUEGOS

lastimar a sus compañeros, ya sea de manera física o psicológica. No obstante, este hallazgo, aunque resulta alentador, debe observarse con cautela, ya que existe un grupo de estudiantes que superan la tercera parte del total en quienes se observan comportamientos agresivos, es decir, regularmente tienen la disposición de lastimar o herir a sus compañeros, lo cual provocaría el

resquebrajamiento de la atmósfera psicológica del aula y entorno escolar.

Asimismo, el nivel de agresividad verbal (39 %), ira (43,2 %) y hostilidad (50 %) predominante fue bajo, no obstante, el nivel de agresividad física (42 %) que caracterizó a los estudiantes fue moderado.

Cuadro 2

Resultados descriptivos de la variable trastorno por uso de videojuegos y sus dimensiones

Variable y dimensiones	Alto		Moderado		Bajo	
	n	%	n	%	n	%
Trastorno por uso de videojuegos	52	19,7	99	37,5	113	42,8
Abstinencia	64	24,2	90	34,1	110	41,7
Abuso y tolerancia	49	18,6	90	34,1	125	47,3
Problemas ocasionados	69	26,1	110	41,7	85	32,2
Dificultad en el control	42	15,9	99	37,5	123	46,6

Cuadro 3

Resultados descriptivos de la variable comportamiento agresivo y sus dimensiones

Variable y dimensiones	Alto		Moderado		Bajo	
	n	%	n	%	n	%
Comportamiento agresivo	56	21,2	98	37,1	110	41,7
Agresividad física	67	25,4	111	42,0	86	32,6
Agresividad verbal	68	25,8	93	35,2	103	39,0
Ira	61	23,1	89	33,7	114	43,2
Hostilidad	34	12,9	98	37,1	132	50,0

En el Cuadro 4 se pueden ver los datos obtenidos mediante de la prueba de normalidad Kolmogorov-Smirnov. En ese entender, la magnitud de error de la prueba para las variables TUV y CA fue superior al nivel de significancia ($p > 0,05$), lo cual indica que las puntuaciones se ajustan a la distribución normal. Por ello, se optó por utilizar la prueba paramétrica r de Pearson para determinar si las variables y dimensiones se relacionaban de manera significativa.

En el Cuadro 5 se determinó que el TUV se relacionaba de manera directa y significativa con el CA ($r=0,484$; $p < 0,05$). Asimismo, se halló

que el TUV también se relacionaba de manera directa y significativa con las dimensiones agresividad física ($r=0,502$; $p < 0,05$); agresividad verbal ($r=0,447$; $p < 0,05$); ira ($r=0,463$; $p < 0,05$) y hostilidad ($r=0,477$; $p < 0,05$).

En relación con el análisis de regresión lineal, en el Cuadro 6 se observa que existe un ajuste adecuado al modelo (Prueba $F=24,456$; $p < 0,05$), es decir, el TUV ($\beta=0,817$; $p < 0,05$) predijo de manera significativa el CA de los estudiantes (R^2 ajustado= 0,231). Además, los valores t de los coeficientes de regresión Beta de la variable predictora fueron significativos ($p < 0,05$).

Cuadro 4
Prueba de normalidad Kolmogorov-Smirnov para las variables de estudio

VARIABLES	Estadístico	Kolmogorov-Smirnov gl	Sig.
Trastorno por uso de videojuegos	0,144	264	0,121
Comportamiento agresivo	0,131	264	0,085

Cuadro 5
Matriz de correlación entre las variables y dimensiones

VARIABLES	1	2	3	4	5	6
1. Trastorno por uso de videojuegos	1	-	-	-	-	-
2. Comportamiento agresivo	0,484**	1	-	-	-	-
3. Agresividad física	0,502**	0,684**	1	-	-	-
4. Agresividad verbal	0,447**	0,654**	0,666**	1	-	-
5. Ira	0,463**	0,699**	0,681**	0,694**	1	-
6. Hostilidad	0,477**	0,673**	0,642**	0,683**	0,677**	1

** . La correlación es significativa al nivel 0,01 (bilateral).

Cuadro 6
Análisis de regresión lineal

PREDICTORES	B	Error estándar	β	T	p
(Constante)	1,220	0,475		2,566	0,012
Trastorno por uso de videojuegos	0,796	0,052	0,817	15,402	0,0001

Nota: R² ajustado= 0,231; p<0,05; F= 24,456

DISCUSIÓN

El TUV ha sido descrito como un comportamiento adictivo de relevancia clínica aún controversial luego de su inclusión en los sistemas clasificatorios referentes en salud mental (DSM-V y CIE-11). Los estudios han demostrado consistentemente que cuando los adolescentes pasan una cantidad excesiva de tiempo en los videojuegos, muestran numerosos comportamientos patológicos, como la preocupación, retraimiento, pérdida de control y conflictos interpersonales o intrapersonales. En ese sentido, la presente investigación buscó

determinar si el TUV se relacionaba de manera significativa con el CA de los adolescentes de educación secundaria de la Amazonía peruana.

Un primer hallazgo da cuenta que el nivel del TUV del 42,8 % de estudiantes era bajo, es decir, se caracterizaban por tener un patrón de comportamiento hacía los juegos en línea o fuera de línea poco recurrente, ya que accedían a los videojuegos sin descuidar sus responsabilidades y actividades diarias. Resultados similares fueron obtenidos en Perú, donde evaluaron la dependencia a los videojuegos en los adolescentes y determinaron que el nivel predominante era bajo, caracterizado por la dificultad que tenían para dejar de jugar y, por otro lado, la necesidad

de acceder a los videojuegos cuando estaban aburridos (38). Asimismo, en Eslovenia se realizó un estudio para explorar las características de los jugadores de videojuegos y determinaron que la prevalencia del TUV era baja, ya que se determinó que el 4,7 % de los adolescentes eran jugadores de alto riesgo (1).

Respecto al comportamiento agresivo, se determinó que el nivel que caracterizó a los estudiantes fue bajo, lo cual indica que pocas veces tenían la disposición o comportamientos orientados a lastimar a sus compañeros, ya sea de manera física o psicológica. Resultados casi similares a los descritos fueron obtenidos en Perú, donde evaluaron la agresividad de los estudiantes de secundaria y determinaron que los niveles predominantes fluctuaban entre bajo y moderado (41). Del mismo modo, también en Perú evaluaron el CA en los estudiantes de colegios públicos y determinaron que los niveles predominantes fueron bajo y moderado (42).

Un hallazgo relevante indica que existe una relación directa y significativa entre el TUV y el CA de los adolescentes de educación secundaria de la Amazonía peruana. El coeficiente de correlación r de Pearson fue de 0,484 y el p -valor fue inferior al nivel de significancia ($p < 0,05$). Este hallazgo es coherente con lo reportado en un estudio realizado en Nepal, donde encontraron que existía una relación positiva y significativa ($r = 0,239$; $p < 0,05$) entre las puntuaciones de los trastornos del juego y la agresión, por ello, las autoridades competentes debían organizar programas de sensibilización y enfoques de intervención psicosocial efectivos para que los estudiantes mejoren el conocimiento sobre el uso nocivo de los videojuegos (28). Asimismo, en Arabia Saudita se realizó un estudio donde determinaron que jugar videojuegos aumentaba los comportamientos agresivos de los adolescentes, por lo que era necesario reeducar a los padres para que programen y limiten el tiempo que sus hijos pasan jugando videojuegos (29).

Al realizar un análisis predictivo complementario, se estableció que el TUV predijo de manera significativa el CA de los estudiantes, lo cual quiere decir que mientras exista una mayor dependencia y un uso descontrolado y compulsivo de los videojuegos, se reportarán mayores niveles de CA en los adolescentes.

En la actualidad, muchos videojuegos se han tornado cada vez más atractivos para los adolescentes, ya que presentan escenarios atractivos, una interacción con los demás jugadores y una organización en niveles con un nivel de dificultad dosificado, lo cual implica que cualquier adolescente pueda convertirse en jugador potencial y se incrementen la sensación de competencia (36). Este contexto sería favorecedor para que los adolescentes no puedan controlar el tiempo que disponen para los videojuegos, le den mayor prioridad que a las actividades del día a día e, incluso, incrementen su tiempo de conexión a pesar que conocer los perjuicios que les podría ocasionar.

Entonces, el TUV podrían incrementar los niveles del CA o la impulsividad en dos contextos muy concretos: durante el juego (principalmente a través de la agresión verbal u hostilidad) y fuera de él (más aún si son videojuegos con contenidos violentos o inapropiados), ya que tratarían de replicar los comportamientos violentos explícitos en la vida real frente a sus pares (43). Asimismo, el CA también podría evidenciarse cuando los adolescentes no pueden acceder a los videojuegos, aspecto estrechamente relacionado con la abstinencia. En ese entender, podrían mostrar síntomas como la irritabilidad o agresividad debido a la frustración desarrollada por no poder jugar (44).

La presente investigación aborda tópicos que actualmente resultan controversiales y en el contexto peruano han sido poco estudiado, aspectos que realzan su relevancia. Sin embargo, es necesario precisar algunas limitaciones. En primer lugar, el tamaño de la muestra resulta relativamente pequeño y además es homogéneo, lo cual supone ser cautelosos al interpretar los resultados. En segundo lugar, los hallazgos se basan completamente en datos obtenidos de instrumentos autoadministrados, lo cual podría haber provocado valoraciones subjetivas por parte de los participantes. En ese orden de ideas, se espera que en futuras investigaciones se amplíe el tamaño de la muestra, incluyendo a estudiantes de diversas características socioculturales, y se utilicen instrumentos de recolección de datos que complementen a los aplicados para que le den mayor objetividad al mencionado proceso.

CONCLUSIÓN

En la presente investigación se determinó que existe una relación directa y significativa entre el TUV y el CA de los adolescentes de educación secundaria de la Amazonía peruana. El coeficiente de correlación r de Pearson fue de 0,484 y el p -valor fue inferior al nivel de significancia ($p < 0,05$). Asimismo, se determinó que el TUV se relacionaba de manera directa y significativa con las dimensiones agresividad física, agresividad verbal, ira y hostilidad. Los coeficientes de correlación r de Pearson fueron de 0,502; 0,447; 0,463 y 0,477, respectivamente, también resultando estadísticamente significativos en todos los casos ($p < 0,05$).

En coherencia con lo expuesto, se recomienda al personal directivo y docentes promover campañas de sensibilización sobre los riesgos de jugar videojuegos de manera continua y compulsiva. Por otro lado, se debe orientar a los padres de familia para que limiten el tiempo en el que sus los adolescentes permanecen conectados a los videojuegos y eviten que jueguen videojuegos violentos o poco apropiados para sus edades.

REFERENCIAS

1. Macur M, Pontes H. Internet Gaming Disorder in adolescence: investigating profiles and associated risk factors. *BMC Public Health*. 2021;21(1):1547.
2. Allahverdipour H, Bazargan M, Farhadinasab A, Moeini B. Correlates of video games playing among adolescents in an Islamic country. *BMC Public Health*. 2010;10:286.
3. Przybylski A, Weinstein N. Violent video game engagement is not associated with adolescents' aggressive behaviour: Evidence from a registered report. *R Soc Open Sci*. 2019;6(2):171474.
4. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5)*: USA: American Psychiatric Publishing; 2013.
5. Griffiths M, Pontes H. The future of gaming disorder research and player protection: What role should the video gaming industry and researchers play? *Int J Ment Health Addict*. 2020;18(3):784-790.
6. Wang Q, Ren H, Long J, Liu Y, Liu T. Research progress and debates on gaming disorder. *Gen Psychiatr*. 2019;32(3):e100071.
7. Paulus F, Ohmann S, Von Gontard A, Popow C. Internet gaming disorder in children and adolescents: A systematic review. *Dev Med Child Neurol*. 2018;60(7):645-659.
8. Han D, Bolo N, Daniels M, Arenella L, Lyoo I, Renshaw P. Brain activity and desire for Internet video game play. *Compr Psychiatry*. 2011;52(1):88-95.
9. Yau Y, Crowley M, Mayes L, Potenza M. Are internet use and video-game-playing addictive behaviors? Biological, clinical and public health implications for youths and adults. *Minerva Psychiatr*. 2012;53(3):153-170.
10. Mihara S, Higuchi S. Cross-sectional and longitudinal epidemiological studies of Internet gaming disorder: A systematic review of the literature. *Psychiatry Clin Neurosci*. 2017;71(7):425-444.
11. Kuss D. Policy, prevention, and regulation for internet gaming disorder. *J Behav Addict*. 2018;7(3):553-555.
12. Esteve A, Jovani A, Benito A, Baquero A, Haro G, Rodríguez-Ruiz F. Dual diagnosis in adolescents with problematic use of video games: Beyond substances. *Brain Sci*. 2022;12(8):1110.
13. Heizomi H, Jafarabadi M, Kouzekanani K, Matlabi H, Bayrami M, Chattu V, et al. Factors affecting aggressiveness among young teenage girls: A structural equation modeling approach. *Eur J Investig Health Psychol Educ*. 2021;11(4):1350-1361.
14. Bushman B, Anderson C. Is it time to pull the plug on the hostile versus instrumental aggression dichotomy? *Psychol Rev*. 2001;108(1):273-279.
15. Allen J, Anderson C, Bushman B. The general aggression model. *Curr Opin Psychol*. 2018;19:75-80.
16. Warren P, Richardson D, McQuillin S. Distinguishing among nondirect forms of aggression. *Aggress Behav*. 2011;37(4):291-301.
17. Estévez E, Jiménez T, Moreno D. Aggressive behavior in adolescence as a predictor of personal, family, and school adjustment problems. *Psicothema*. 2018;30(1):66-73.
18. Buchmann A, Hohmann S, Brandeis D, Banaschewski T, Poustka L. Aggression in children and adolescents. *Curr Top Behav Neurosci*. 2014;17:421-442.
19. Collins A, Loftus E. A spreading-activation theory of semantic processing. *Psychol Rev*. 1975;82(6):407-428.
20. Anderson C, Bushman B. Human aggression. *Annu Rev Psychol*. 2002;53:27-51.
21. Epps J, Kendall P. Hostile attributional bias in adults. *Cognit Ther Res*. 1995;19(2):159-178.
22. Estrada E, Mamani M, Gallegos N, Mamani H. Adicción a internet y agresividad en estudiantes peruanos de educación secundaria. *Apunt Univ*. 2020;11(1):140-157.

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23. Pinazo D, García L, García R. Implementación de un programa basado en mindfulness para la reducción de la agresividad en el aula. *Rev Psicod.* 2020;25(1):30-35.
24. Cuenca V, Mendoza B. Comportamiento prosocial y agresivo en niños: tratamiento conductual dirigido a padres y profesores. *Acta de Investigación Psicol.* 2017;7(2):2691-2703.
25. Buss A. *La psicología de la agresión.* New York: Wiley; 1961.
26. Shao R, Wang Y. The relation of violent video games to adolescent aggression: An examination of moderated mediation effect. *Front Psychol.* 2019;10:384.
27. Aleissa M, Alhowaish N, Almutairi W, Almanea T, Alkhashki S, Alenezi S. The impact of videogame on aggressive behaviors among adolescents in Saudi Arabia: a national study. *Int J Res Med Sci.* 2023;11(1):22-29.
28. Joshi A, Sharma K, Sigdel D, Thapa T, Mehta R. Internet gaming disorder and aggression among students on school closure during COVID-19 pandemic. *J Nepal Health Res Counc.* 2022;20(1):41-46.
29. Aleissa M, Alenezi S, Saleheen H, Bin Talib S, Khan A, Altassan S, Alyahya A. The association between video game type and aggressive behaviors in Saudi youth: A pilot study. *Behav Sci (Basel).* 2022;12(8):289.
30. Lemmens J, Valkenburg P, Peter J. The effects of pathological gaming on aggressive behavior. *J Youth Adolesc.* 2011;40(1):38-47.
31. Matalinares M, Arenas I, Díaz A, Dioses A. Adicción a la internet y agresividad en estudiantes de secundaria del Perú. *Rev Investig Psicol.* 2013;16(1):75-93.
32. Anderson C, Bushman B. Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: a meta-analytic review of the scientific literature. *Psychol Sci.* 2001;12(5):353-359.
33. Peralta-Cabrejos L, Torres-Flores M. Adicción a videojuegos en relación con la conducta antisocial y delictiva en adolescentes de un colegio estatal de Lima. *CASUS.* 2021;5(3):118-130.
34. Kühn S, Kugler D, Schmalen K, Weichenberger M, Witt C, Gallinat J. Does playing violent video games cause aggression? A longitudinal intervention study. *Mol Psychiatry.* 2019;24(8):1220-1234.
35. Hernández R, Mendoza C. *Metodología de la investigación: las rutas cuantitativa, cualitativa y mixta.* México: McGraw-Hill; 2018.
36. Chóliz M, Marco C. Patrón de uso y dependencia de videojuegos en infancia y adolescencia. *An Psicol.* 2011;27(2):418-426.
37. Salas E, Merino C, Chóliz M, Marco C. Análisis psicométrico del test de dependencia de videojuegos (TDV) en población peruana. *Univ Psychol.* 2017;16(4):1-13.
38. Estrada E, Paricahua J, Velásquez L, Paredes Y, Quispe R, Farfán M, et al. Dependencia a los videojuegos en estudiantes de educación secundaria de la Amazonía peruana. *Arch Ven Famarcol Ter.* 2022;41(4):242-250.
39. Buss A, Perry M. The aggression Questionnaire. *J Pers Soc Psychol.* 1992;63(3):452-459.
40. Matalinares M, Yaringaño J, Uceda J, Fernández E, Huari Y, Campos A, Villavicencios N. Estudio psicométrico de la versión española del Cuestionario de Agresión de Buss y Perry. *Rev Investig Psicol.* 2012;15(1):147-161.
41. Estrada E, Gallegos N, Mamani H, Zuloaga M. Autoestima y agresividad en estudiantes peruanos de educación secundaria. *Arc Ven Farmacol Ter.* 2021;40(1):81-87.
42. Vergaray S, Palomino B, Obregón M, Yachachin Á, Murillo G, Morales J. Conducta agresiva en adolescentes de colegios estatales de un Distrito del Callao. *Health Care Glob Health.* 2018;2(1):6-12.
43. Jeong H, Lee H, Kwon Y, Yim H, Lee S. Gaming disorder and bidirectional relationships with aggression and impulsivity. *Curr Opin Behav Sci.* 2020;31:69-75.
44. Gros L, Debue N, Lete J, Van de Leemput C. Video game addiction and emotional states: Possible confusion between pleasure and happiness? *Front Psychol.* 2020;10:2894.

Effect of Workload and Work Environment on the Anxiety of Health Workers in Dealing with Tuberculosis Patients

Efecto de la carga de trabajo y el ambiente de trabajo en la ansiedad de los trabajadores de la salud en el trato con pacientes con tuberculosis

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SUMMARY

The effect of workload and work environment on employee performance is very influential. Providing workload effectively is useful for knowing the extent to which employees can be given the maximum workload. Primarily, for healthcare workers, the workload should be properly distributed because it is not only about patient services, but they also need to pay attention to their own health from various kinds of infectious diseases in the healthcare facility. This study aims to determine the effect of workload and work environment on the health of workers' anxiety in dealing with tuberculosis patients at Batua Health Center, Makassar City. This study uses a quantitative research design using a cross-sectional study approach. The population and samples were taken using a total sampling technique, namely health workers at the

Batua Health Center, Makassar City, with a total of 58 respondents. The research was conducted in November-December 2022. The result shows that workload significantly affects the health of workers' anxiety, with a p-value = 0.021. The test results also obtained an Exp(B) value of 4,456. Statistical test with Chi-Square obtained p-value = 0.004 < α 0.05, so H_0 is rejected, meaning that statistically there is a relationship between the work environment and the health anxiety of workers at Batua Health Center with an OR value of 5.204, meaning that the work environment is less likely 5 times to cause anxiety in the health of workers.

Keywords: Influences, workloads, work environment, health center.

RESUMEN

El efecto de la carga de trabajo y el entorno de trabajo en el desempeño de los empleados es muy influyente, donde proporcionar la carga de trabajo de manera efectiva es útil para saber hasta qué punto se puede dar a los empleados la máxima carga de trabajo. En especial, para los trabajadores de la salud, la carga de trabajo debe distribuirse adecuadamente porque no solo se trata de los servicios al paciente, sino que también deben prestar atención a su propia salud frente a diversos tipos de enfermedades infecciosas en el centro de salud. Este estudio tiene como objetivo determinar el efecto de la carga de trabajo y el entorno laboral en la salud de la ansiedad de los trabajadores al tratar con pacientes con tuberculosis en el Centro de Salud de Batua, en la ciudad de Makassar. Este estudio empleó un diseño de investigación cuantitativa

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utilizando un enfoque de estudio transversal. La población y las muestras en este estudio se tomaron utilizando una técnica de muestreo total, a saber, trabajadores de la salud en el Centro de Salud de Batua, ciudad de Makassar, un total de 58 encuestados. La investigación se realizó en noviembre-diciembre de 2022. El resultado muestra que la carga de trabajo tiene un efecto significativo en la salud de la ansiedad de los trabajadores con un valor de $p = 0,021$. Los resultados de la prueba también obtuvieron un valor $Exp(B)$ de 4 456. La prueba estadística con Chi-Cuadrado obtuvo p -valor = $0,004 < \alpha 0,05$, por lo que se rechaza H_0 , es decir que estadísticamente existe una relación entre el ambiente de trabajo y la ansiedad por la salud de los trabajadores del Centro de Salud de Batua con un valor de OR de 5 204, es decir, que el ambiente de trabajo tiene 5 veces menos probabilidades de causar ansiedad en la salud de los trabajadores.

Palabras llave: *Influencias, cargas de trabajo, ambiente de trabajo, Centro de salud.*

INTRODUCTION

Health workers, based on the Law of the Republic of Indonesia concerning Health No. 36 of 2014, are any person who is dedicated to the health sector and has knowledge and skills through education in the health sector for certain types that require the authority to carry out health efforts. Health workers also have an important role to play in improving the maximum quality of health services to the community so that the community can increase awareness, willingness, and ability to live healthily to be able to realize the highest degree of health as an investment for the development of socially and economically productive human resources (1).

Every day in carrying out their service, health workers do not only deal with patients, coworkers, nurses, and other fellow medical staff who deal with doctors and regulations in the workplace and workload, which are sometimes considered not in accordance with their physical, psychological, and mental conditions. Emotional issues that affect the workload of medical personnel are when the patient's condition is unstable, the average number of hours of care needed to provide direct services to patients exceeds the ability of medical staff, the desire to achieve work, and high work demands (2).

The impact of a workload that is too heavy will make medical personnel dissatisfied with their work, and less enthusiastic and trigger a psychological impact on medical personnel. Health workers who have a heavy workload tend to feel the need for counseling and psychotherapy, carried out individually, both online and face-to-face (2). In addition to workload, the work environment is another factor that affects employee performance. An uncondusive work environment will make employees fall sick easily, get stressed easily, have difficulty concentrating and decrease work productivity. The effect of workload and work environment on employee performance is very influential (3).

In KwaZulu-Natal Province, South Africa, doctors, especially young doctors, can also experience burnout, anxiety, and depressive symptoms due to limited resources in the hospital. Younger doctors are more prone to burnout, while older doctors are more likely to experience anxiety and depressive symptoms. Therefore, individual- and organization-focused solutions should be considered wisely to reduce the negative impact of a high work environment and workload (4).

In general, anxiety is the psychological state of a person who is filled with fear and worries about something that is not certain to happen. Anxiety is described as a form of negative word and physiological stimulation. According to the American Psychological Association (APA), anxiety is an emotional state that arises when a person feels distressed, and tense and is accompanied by physical responses such as heart palpitations, increased blood pressure, and so on (5).

Diseases can be divided into 2, namely infectious diseases and non-infectious diseases, infection is an invasive process by microorganisms that proliferates in the body that causes pain. In general, the process of disease occurrence involves three interacting factors, namely: disease-causing factors (agents), human factors or hosts (hosts), and environmental factors (6). The Republic of Indonesia Ministry of Health 2014 stated that tuberculosis is an infectious disease caused by the bacterium *Mycobacterium tuberculosis* which is transmitted through sputum splashes. Tuberculosis bacteria usually attack the lungs, common people usually call them lung spots or hollow lungs.

Indonesia has a record of tuberculosis cases in terms of gender, the highest tuberculosis incidence rates are in several provinces in Indonesia. The first position was occupied by the province of West Java with a total of 23 774 cases of pulmonary tuberculosis. The province of North Sumatra occupied the top 4 positions with a total of 7 764 cases of pulmonary tuberculosis (7). Based on data from The Ministry of Health for 2020, tuberculosis cases can be influenced by several factors, including the physical and environmental conditions of residence. Unhealthy physical quality of residence is the biggest cause that causes the development of *Mycobacterium tuberculosis*. Poor ventilation can block sunlight from entering the room, creating a damp and dark atmosphere. Several risk factors for the home environment contribute to the incidence of pulmonary tuberculosis, namely residential density, type of floor, ventilation, humidity, and an environment that is far from healthy (7). One source of transmission of tuberculosis in Public Health Center (Puskesmas) is health workers who have a very large role in preventing tuberculosis because health workers often have direct contact with patients (8). According to WHO data as of July 14, 2020, the number of positive patients in Indonesia was 76 981 people with an average addition of 1 000 cases per day (9). The total deaths of 3 565 people were classified as community transmission.

Based on data from the official website of the South Sulawesi Provincial government, the number of positive patients in Makassar City is 4 430 people (10). Batua Health Center is a health center located in Makassar City, South Sulawesi. The number of health workers at the Batua Health Center is 58 people. It is also known that 119 patients with tuberculosis were registered at the Public Health Center (Puskesmas) in January-May 2022. Thus, this study aimed to assess the influence of workload and work environment on the anxiety of health workers in dealing with tuberculosis patients at the Batua Health Center, Makassar City.

METHOD

This study used a quantitative research design using a cross-sectional study approach. The

population and sample in this study were taken using a total sampling technique, namely the health workers of the Batua Health Center in Makassar City, totaling 58 respondents. The research was conducted in November-December 2022.

Data Analysis Method

Descriptive Analysis allows to know the distribution of the data, helps to detect outliers and typos, and enable to identify associations among variables.

Logistic Regression Analysis, will be carried out as model estimation and model fit testing:

Maximum Likelihood: Linear regression analysis uses an ordinary least square (OLS) estimator that minimizes the sum of the squares of the difference between the actual dependent variable value and its prediction. In contrast, the relationship between the dependent and independent variables in logistic regression is non-linear so it requires a different procedure, namely the maximum likelihood estimator with an iteration process that finds the estimated coefficients instead of minimizing the square deviation but maximizing the probability of an event occurring.

Logistic Regression Equation Model: The mathematical model of logistic regression is:

$$\ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = B_0 + B_1X$$

where P is the event of something happening (success) otherwise, (1 - P) is the event of something not happening (failure) and β_i is the logistic regression coefficient. The following mathematical formula determines the predicted probability of the dependent variable:

$$\hat{p} = \frac{\exp(B_0 + B_1X)}{1 + \exp(B_0 + B_1X)} = \frac{e^{B_0 + B_1X}}{1 + e^{B_0 + B_1X}}$$

Overall Model Test: The overall model test is carried out with the G test or what is commonly called the log-likelihood ratio test (-2Log L), which is the comparison between the log-likelihood of the proposed model

($-2\text{Log } L_{\text{Proposed}}$) and the log-likelihood of the base model / null model ($2\text{Log } L_{\text{Null}}$). The log-likelihood proposed model means a model that includes independent variables while the log-likelihood null model is a model that only includes constants. The log-likelihood ratio test is Chi-Square distributed with a free degree of p independent variables included in the model and a certain α , for example, $\alpha = 5\%$. The testing process is as follows:

Hypothesis $H_0: \beta_1 = \beta_2 = \dots = \beta_p = 0$

H_1 : At least one $\beta_i \neq 0, i=1,2,\dots,p$

Testing Statistics Log Likelihood Ratio Test or G test which follows the Chi-Square distribution with free degree p and $\alpha = 5\%$. The decision criterion is to reject H_0 if the Chi-Square p -value is smaller than $\alpha = 5\%$. The testing process is as follows:

Hypothesis

H_0 : The proposed model fits the data

H_1 : The proposed model does not fit the data

The test statistic is the Hosmer and Lemeshow test which has a Chi-Square distribution with a degree of freedom of 8. The decision criterion is to reject H_0 if the p -value of Chi-Square $\alpha = 5\%$. The H-L statistic test is a Pearson Chi-Square statistic test that assumes that the number of samples used must be sufficient (large sample) with the expected frequency of each cell more than 5. *Partial Test*: After checking the overall model test, the next step is to see the meaning of the regression coefficient of each independent variable and whether it has a significant effect on the dependent variable. This test uses Wald statistics.

Operational Definitions

Workload (X1): Workload is any form of work given to human resources to be completed within a certain period. The workload indicators in this study are targets that must be achieved, working conditions, and work standards. Workload measurement uses a Likert scale with a value interval of 1-4. The assessment category consists

of very suitable with a value of 4, suitable with a value of 3, less suitable with a value of 2, and not suitable with a value of 1. The number of questions is 6 numbers. The measurement criteria are based on a Likert scale, where each answer has a score. The highest score is 4 and the lowest score is 1.

The objective criteria are:

Good: if the respondent's answer score is $\geq 62.5\%$ of the most appropriate answer.

Less Good: if the scheduled score is $< 62.5\%$ of the most appropriate answer.

Work Environment (X2): Work environment indicators (used in this study) are work atmosphere, availability of facilities for employees, and relationship with coworkers. Measurement of the work environment uses a Likert scale with a value interval of 1-4. The assessment category consists of very suitable with a value of 4, suitable with a value of 3, less suitable with a value of 2, and not suitable with a value of 1. The number of questions is 6 numbers. The measurement criteria are based on the Likert scale, where each answer has a score. The highest score is 4 and the lowest score is 1. The objective criteria are:

Good: if the respondent's answer score is $\geq 62.5\%$ of the most appropriate answer.

Less Good: if the scheduled score is $< 62.5\%$ of the most appropriate answer.

Anxiety (Y): The dependent variable or dependent variable used in the study is health worker anxiety (Y). Anxiety is a response to certain threatening situations and is a normal thing that occurs accompanied by development, change, new experiences, and in finding self-identity. Workload measurement uses a Likert scale with a value interval of 1-4. The assessment category consists of very suitable with a value of 4, suitable with a value of 3, less suitable with a value of 2, and not suitable with a value of 1. The number of questions is 14 numbers. The measurement criteria are based on the Likert scale, where each answer has a score. The highest score is 4 and the lowest score is 1. The objective criteria are:

Good: if the respondent's answer score is \geq 62.5 % of the most appropriate answer.

Less Good: if the scheduled score is $<$ 62.5 % of the most appropriate answer.

RESULTS

Table 1. Distribution of Respondents by Gender, Age, Education, Profession, Anxiety, Workload, and Work Environment at the Batua Health Center in Makassar City

	Research Sample	
	Amount (n)	Percentage (%)
Gender		
Man	25	43.1
Woman	33	56.9
Age		
<20 years	2	3.4
20-29 years	20	34.5
30-39 years	22	37.9
40-49 years	10	17.2
>50 years	4	6.9
Education		
D3/equivalent	26	44.8
Profession	19	32.8
S1	7	12.1
S2	3	5.2
Specialist	3	5.2
Profession		
Midwifery	14	24.1
Nursing	27	46.6
Medical	4	6.9
Non-Medical	13	22.4
Worry		
Not good	20	34.5
Good	38	65.5
Workload		
Not good	25	43.1
Good	33	56.9
Work environment		
Not good	19	32.8
Good	39	67.2

Source: Primary Data

EFFECT OF WORKLOAD AND WORK ENVIRONMENT ON THE ANXIETY

Table 2. The Relationship between Workload and Work Environment with Anxiety of Health Workers in Dealing with Tuberculosis Patients at the Batua Health Center in Makassar City

Variable	Health Worker Anxiety				Total		P-value
	Not good		Good		N	%	
	n	%	n	%			
Workload							0.006
Not good	14	56.0	11	44.0	25	100	
Good	6	18.2	27	81.8	33	100	
Work environment							0.004
Not good	12	63.2	7	36.8	19	100	
Good	8	20.5	31	79.5	33	100	

Source: Primary Data

Table 3. Correlation Matrix

		Correlation Matrix		
		Constant	Workload	Work environment
Step 1	Constant	1.000	-0.636	-0.714
	Workload	-0.636	1.000	-0.036
	Work environment	-0.714	-0.036	1.000

Table 4. Evaluation of Logistic Regression Model (Simultaneous Test)

Omnibus Tests of Model Coefficients				
		Chi-square	df	Sig.
Step 1	step	15,730	2	0.0001
	blocks	15,730	2	0.0001
	Model	15,730	2	0.0001

Table 5. Hosmer and Lemeshow test

Hosmer and Lemeshow Test			
step	Chi-Square	df	Sig.
1	0.019	2	0.991

DISCUSSION

Effect of Workload on Anxiety of Health Workers

The workload is an aspect that must be considered by every health service agency because affects officers in increasing productivity and a sense of comfort at work. This is because a balanced workload can maximize or even worsen productivity in terms of quality or quality of products / real results from the resources deployed. The need for division or transfer of tasks among frontline health workers based on complexity and ability (11).

Workload represents the cost of accomplishing mission requirements for the human operator. The workload is physical and mental and both are always related to each other and when a person performs a specific task, they cannot be completely separated. The workload can occur due to various factors, such as the number of tasks that are physical and mental, anxiety, reduced rest time, gender, and age. The workload can appear with various types of severity, for example, light workload, moderate workload, and even heavy workload (12). The high workload felt by health workers at Batua Health Center is caused by the high demands of work that must be completed optimally in a quality service manner.

This can be seen from the statements of health workers that as many as 34.5 % feel they are not in accordance with the demands of their work to always provide quality services. Excessive workload and too little workload can affect the performance of health workers. Indicators of the dimensions of work demands are too much workload to complete in a certain time and excessive workload to be completed by health workers who are unable to carry out a task.

This research is in line with Dewi, from Wates Hospital, who indicated that most nurses have a moderate workload, namely 48 nurses (52.7 %). A heavy workload could cause nurse burnout. Burnout, or exhaustion, is a common cause of mental health problems in the workplace. It can be a major barrier to making meaningful contributions in the personal and professional life. Burnt out nurses cannot work efficiently. Nurse burnout occurs when nurses work over 80 % of their working hours. Nurses perform their duties for about 80 % of their productive time. The workload can also be affected by the type of work itself. One factor that affects workload is mental work assignments, such as the job's difficulty level, and responsibility for work (13).

Pulmonary Tuberculosis (Pulmonary TB) is a contagious infectious disease that is a public health problem in the world, this can generate anxiety on the workers mental health due to their knowlege of the possibility of TB transmission (14). The relationship between workload and work environment with anxiety of Health workers in dealing with Tuberculosis patients at the Batua Health Center in Makassar City, showed that as many as 56.0 % of officers who had a bad workload also experienced bad anxiety, while 81.8 % of health workers who had a good workload had good anxiety. This shows that the better the workload of health workers, the better the anxiety level of health workers at the Batua Health Center in Makassar City tends to be.

According to Purwaningsih et al. (2017) workload in the room does not always cause anxiety among nurses and can cause anxiety if the workload is not proportional to the physical abilities, experience, and expertise of nurses, and the time available. Every nurse has a normal ability to complete the tasks assigned to her. Every nurse has a different way of managing anxiety,

depending on the duration, type, and frequency of anxiety she experiences (15).

Anxiety levels can be influenced by age, gender, family status, patient honesty, availability of personal protective equipment, and knowledge, significantly affecting how a person handles anxiety and copes while undergoing treatment. This is in line with research data that 46.8 % of people aged 26-30 years suffer from mild anxiety disorders. The workload is all the factors that determine the person who is working. Another definition of workload is a portion of the capacity of the worker's ability to do his job. Workload affects individual performance in carrying out the work performed. The workload is not only seen from the physical load alone, but the workload can also be a mental burden that can affect the anxiety of health workers.

The results of the logistic regression test in this study showed that workload had a significant effect on the anxiety of health workers with a p-value = 0.021. It was also obtained that the Exp(B) value was 4.456, which means that workload has an effect of 4 times on anxiety. The higher the workload of health workers, it will affect anxiety 4 times compared to a good workload. Workers who have excessive workloads will reduce productivity and quality of work, and the execution of work is not timely, unsatisfactory, and results in disappointment. Excessive workload and too little workload are stress generators. The workload can be further divided into workloads because the work is quantitatively overloaded, i.e. the large number of jobs that must be completed with a shorter time to complete. As for the workload due to quality overload, that is, individuals who feel unable to do or complete "a task" because their work requires higher abilitie.

The above statement is supported by one study in South Africa, which states that hopelessness, helplessness, and lack of motivation are the result of a variety of issues, including health workers' time constraints and their heavy workload which can reduce focus on the needs and feelings of TB patients (16). Health workers were dissatisfied with organizational policies including limited opportunities for vacation, involvement in non-TB tasks, long working hours, and inflexible work schedules. Efforts to improve the motivation and

retention of healthcare workers need to address the quality of the work-life dimension, which focuses on the organization's requirements to achieve employee well-being, as this may contribute to their job satisfaction (17).

Research at Tikung Lamongan Health Center indicate that a high workload can create a low performance for health workers. The workload is still an obstacle due to limited adequate equipment and competent labor. In 2020 and 2021, the workload of health workers is increasing due to the increase in the number of patients received by the Public Health Center while the health workers are decreasing because some are exposed and must be isolate. Therefore, the human resources of the health center must be strengthened to provide better services in the health sector to prevent the occurrence of mental disorders, psychological anxiety, anxiety, and fatigue on the night shift. The workload feels heavy if it is not balanced with the appropriate number of human resources. A high workload can increase burnout and might force health workers to suffer psychological problems (18).

Work overload can be caused by uncertain consumer circumstances, patients who demand to be provided with fast service beyond the ability of normal work in general, the desire for performance, and the desire for a lot of work and must document nursing care (19). Health workers who work to care for TB patients need to be heard for their complaints regarding anxiety and fear of TB transmission from patients and managers of hospitals or health centers need to increase their resources because it is very important to ensure the successful implementation of the new policy and prevent the unintended negative consequences it could have hindered the quality of patient care (20). This indicates that it is necessary to pay attention to workloads that are appropriate or balanced with the ability of health workers to carry out their duties, especially for those who care for TB patients.

The Effect of the Work Environment on the Anxiety of Health Workers

The work environment in an institution, especially the community health center

(Puskesmas), is very important for management to pay attention to. Even though the work environment does not carry out the production process within a company, the work environment directly influences the health workers who carry out the production process. The work environment is an atmosphere where health workers carry out daily activities. A conducive work environment provides a sense of security and allows health workers to work optimally. If the officer likes the work environment in which he works, then the person will feel at home at work, and carry out his activities so that work time is used effectively. Conversely, an inadequate work environment will reduce the performance of health workers at the Public Health Center (21).

Based on the results of interviews using a questionnaire, it was found that 41.4 % of health workers stated that they were not good at working at room temperature to support work activities. An increase in temperature can increase work performance, but on the other hand, it can also reduce work performance. An increase in temperature to a certain limit can generate enthusiasm which will stimulate work performance, but after passing a certain threshold this increase in temperature has begun to interfere with body temperature which can disrupt health workers' performance. All room occupants, in this case, employees, need air quality that meets human health and safety requirements. Therefore, they must always try to maintain the air quality in the room to remain within a comfortable range for employees to work (15). One effort that can be made to get a room that has comfortable air is to use an Air Conditioner (AC). The ideal range for air temperature is between 18°C to 28°C (22).

The work environment is not limited to the physical environment, such as temperature, noise, or workspace design. One that also influences a good work environment is the relationship between co-workers who are open to each other in communicating at the Public Health Center. A comfortable and safe atmosphere dramatically affects the performance and satisfaction of employees in an agency. Idham (23), on health workers at the Kertak Hanyar Health Center, concluded that the calculated P-value for the interpersonal/colleague relationship variable was 5.209, with a variable error rate probability

of 0.0001 (smaller than 0.05) which means that interpersonal relationships/co-workers have a significant effect on job satisfaction.

An unfavorable work environment can cause distractions and threats, in a work environment like this will cause employees to become forgetful, more errors in activities, and decreased their ability to make plans. Changes in working conditions cause employee reactions to be able to adapt to existing conditions. If workers are unable to adapt to existing working conditions, they will tend to experience work stress (24). The results of Chi-Square obtained a p-value = 0.004 $< \alpha$ 0.05, so H_0 was rejected, meaning that, there is a relationship between the work environment and the anxiety of health workers at the Batua Health Center with an OR value of 5.204 meaning that the work environment is less likely to cause 5 times anxiety for health workers.

In dealing with TB patients, many obstacles must be passed by health workers, especially regarding their health. It is well known that TB is an infectious disease that exposes officers to the disease. This can be seen from the results of interviews with health workers dealing with tuberculosis patients at the Public Health Center, it was found that 39.7 % had difficulty breathing (for example, often gasping for air or unable to breathe even though they had not done any physical activity before).

TB is a contagious disease, usually spread through the air by droplet nuclei. Transmission generally occurs indoors, so nurses sometimes feel anxious and afraid to contact or treat TB patients. Nurses or healthcare professionals believe that TB disease has a strong emotional impact on a patient's life since it evokes disability, impotence, and self-discrimination. One of the nurses at a hospital in the Limpopo province of South Africa said that the hospital where they work does not have enough resources for them to do a good job so it affects them emotionally, but they also cannot just stand by, so they feel it is better to risk their lives to save TB patients. Nurses or other health workers must receive specialized support from managers, psychologists, and staff appreciation to provide quality care and maintain good mental health. This study also reports that TB is the most dangerous job for health workers worldwide (25).

A similar study conducted in Southern Ethiopia also revealed that health workers were anxious about the low awareness of the community and the socioeconomic status of TB patients who might transmit the disease to vulnerable family members such as the elderly, pregnant women, and children. In addition, health workers were frustrated by unsuccessful treatment, layoffs, ignorance of care responsibilities, fatigue, shortage of health workers, and not following treatment guidelines properly affecting their actions in following up and treating TB patients, as the disease spreads easily (26).

Quality research in South Africa indicates that health workers have low levels of trust in the workplace. They strike and demand better pay or wages, a safe and comfortable working environment and conditions, and recognition for their work. They don't have the equipment to do their job safely, and some colleagues don't trust, or value their contributions (27). This proves that a conducive work environment is very important for health workers in carrying out their duties, especially for those caring for TB patients.

CONCLUSION

From the results of the study, it can be concluded that: 1) Based on the Chi-Square test, workload and work environment have a significant relationship with the anxiety of health workers in dealing with TB patients, 2) Anxiety of health workers in The Batua Health Center in Makassar City can increase if the overall workload felt by employees can be reduced or suppressed, 3) The work environment of health workers at the Batua Health Center in Makassar City has a significant influence on anxiety perceived by health workers.

SUGGESTION

Based on the results, the authors provide the following suggestions: 1) Health workers are advised to be able to manage their work time by dividing work time with friends to reduce the work environment caused by workload and be able to control emotions well, 2) The need to increase the number of health workers at the

Batua Health Center in Makassar City because there is an unbalanced relation between health workers and patients.

Declaration of Conflict of Interest. All authors declare no potential for conflict of interest in this research and article.

REFERENCES

1. Law-Health Law. Law of the Republic of Indonesia Number 36 of 2014 concerning Health Workers. Minister of Law and Human Rights of the Republic of Indonesia. 2014:4-37.
2. Munandar. Industrial and Organizational Psychology. 2016.
3. Hasibuan M. Human Resource Management. Bumi Aksara; 2012.
4. Naidoo T, Tomita A, Paruk S. Burnout, anxiety, and depression risk in medical doctors working in KwaZulu-Natal Province, South Africa: Evidence from a multisite study of resource-constrained government hospitals in a generalised HIV epidemic setting. *PLoS One*. 2020;15(10 October):1-14.
5. Annisa DF. Basic Concepts of Anxiety. 2016;12-34.
6. Potter P, Perry A. Fundamental Nursing Textbook: Concepts, Processes, and Practices. EGC; 2005.
7. The Ministry of Health. Indonesia Health Profile. Information Technology. 2020;(48):6-11.
8. The Ministry of Health. Indonesia Health Profile. 2015.
9. WHO. Coronavirus disease [Internet]. 2020. Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
10. PPS S. Inter-district data. 2020.
11. Manjunath U, Sarala R, Rajendra D, Deepashree MR, Chokshi M, Mokashi T, et al. Assessment of Workload of ASHAs: A Multi-stakeholder Perspective Study for Task-sharing and Task-shifting. *J Health Manag*. 2022;24(1).
12. Solon M, Madu YG, Tolidunde M, Megawati M. The Impact of Workload on Stress Levels in Health Workers During the COVID-19 Pandemic. *Florence Nightingale J Nurs*. 2021;4(2):94-101.
13. Hutabarat. Basic Concepts of Workload. 2017;
14. Yori SA. Nurses' Experience in Caring for MDR-TB Patients at the Padang City Health Center. 2019.
15. Purwaningsih P, Nursalam N, Nihayati HE, Dewi YS, Sudarsono S. Analisis Beban Kerja Perawat Berdasar Time and Motion Study. *Jurnal Ners*. 2017;2(1):114307.
16. Kallon II, Colvin CJ, Trafford Z. A qualitative study of patients and healthcare workers' experiences and perceptions to inform a better understanding of gaps in care for pre-discharged tuberculosis patients in Cape Town, South Africa. *BMC Health Serv Res*. 2022;22(1):1-14.
17. Ogbuabor DC, Okoronkwo IL. The influence of quality of work life on motivation and retention of local government tuberculosis control programme supervisors in South-eastern Nigeria. *PLoS One*. 2019;14(7):1-15.
18. Purwanti I, Suyanto UY, Dzikri Abadi M, Darianto D, Liliana D. The Role of Burnout between Workload, Work Stress, and Employee Performance: Mediation Model. *KnE Social Sciences*. 2022;2022:70-85.
19. Korkmaz S, Kazgan A, Cekic S, Tartar AS, Balci HN, Atmaca M. The anxiety levels, quality of sleep and life and problem-solving skills in healthcare workers employed in COVID-19 services. *Journal of Clinical Neuroscience*. 2020:131-136.
20. Vanleeuw L, Atkins S, Zembe-Mkabile W, Loveday M. Provider perspectives of the introduction and implementation of care for drug-resistant tuberculosis patients in district-level facilities in South Africa: A qualitative study. *BMJ Open*. 2020;10(2):1-8.
21. Hidayat R. Basic Concepts of Work Environment. Ibi Dharmajaya. 2017;53.
22. Rustiyanto E, Rahayu WA. Documentation Filing Management Medical Records and Health Information. 2011.
23. Idham. The Effect of Salary, Co-Employee Relationship and Job Characteristics on Job Satisfaction (Study of Health Workers at Puskesmas Kertak Hanyar, Banjar District). Kalimantan; 2021.
24. Badri M, Aziz A. The Influence of Locus of Control and Self-Esteem on the Work Motivation of Medan City Education Office Employees. *Analytics: J Master of Psychology UMA*. 2011;3(1):29-36.
25. Matakanye H, Ramathuba DU, Tugli AK. Caring for tuberculosis patients: Understanding the plight of nurses at a regional hospital in Limpopo Province, South Africa. *Int J Environ Res Public Health*. 2019;16(24).
26. Abebe A, Nuriye S, Baza D, Gelgelu TB, Markos M, Woldeyohanes S. Experience and Perception of Healthcare Workers on the Challenges of Follow-Up and Treatment of Tuberculosis Patients in Southern Ethiopia: An Exploratory-Descriptive Qualitative Study. *Risk Manag Healthc Policy*. 2022;15:1931-1945.
27. Anstey Watkins J, Griffiths F, Goudge J. Community health workers' efforts to build health system trust in marginalised communities: a qualitative study from South Africa. *BMJ Open*. 2021;11(5):e044065.

Organizational care of workers during COVID-19: Systematic literature review

Cuidado Organizacional de los trabajadores durante el COVID-19:
revisión sistemática de literatura

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SUMMARY

This article presents the results of a systematic review aimed at investigating the importance of implementing the occupational health and safety system to improve working conditions and the health of employees, leading to the application of necessary measures for prevention of risks produced from the execution of the tasks and the impact of the pandemic on the SGSST in entities that make up the provision of the health service. The sample unit was composed of 36 investigations, identified in the Web of Science, Science Direct, EBSCOhost, and Scopus databases, the search was carried out in the period covered (2018 - 2022), with publications in Spanish, English, and Portuguese. Data analysis was performed through the PRISMA methodology. The results indicate that the occupational health and safety management system played a very important role in the pandemic and that the safety measures contributed to the mitigation of the spread of the virus; likewise, constant monitoring

of the workers' protection strategies should be carried out to adopt a culture of self-care.

Keywords: Labor conditions, health, prevention, SGSST.

RESUMEN

Este artículo presenta resultados de una revisión sistemática encaminada a investigar la importancia de implementar el sistema de seguridad y salud en el trabajo con el objetivo de mejorar las condiciones laborales y la salud de los empleados, llevando estas a la aplicación de medidas necesarias para la prevención de riesgos producidos de la ejecución de las labores y el impacto de la pandemia en el SGSST en entidades que conforman la prestación del servicio de salud. La unidad muestral fue compuesta por 36 investigaciones, identificadas en las bases de datos Web of Science, Science Direct, EBSCOhost, Scopus, la búsqueda fue realizada en el periodo comprendido (2018 - 2022), publicaciones en español, inglés y portugués. El análisis de los datos fue realizada a través de la metodología PRISMA. Los resultados indican que el sistema de gestión de seguridad y salud en el trabajo cumplió un papel muy importante en la pandemia y las medidas de seguridad contribuyeron a la mitigación de la propagación del virus, así mismo, se debe realizar un seguimiento constante a las estrategias de protección de los trabajadores para apropiar la cultura de autocuidado.

Palabras clave: Condiciones laborales, salud, prevención, SGSST.

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INTRODUCTION

In Colombia the implementation of the occupational health program has been regulated since 1979, only in 2004 the implementation of the Andean instrument 584 of the occupational health and safety management system began, after that the Ministry of Labor defined the occupational health and safety management system using law 1562 of 2012 (1).

The above, to generate own actions for the prevention of occupational risks and accidents, which is part of a joint effort between company managers and workers, aimed at improving working conditions achieving an active promotion, and encouraging individual level safety and hygiene (2).

The safety and health of the worker are one of the most important factors to consider within organizations and much more in the entities that make up the provision of health services, the International Labour Organization (ILO) in its annual estimates reveals that each year about 317 million people in the world are victims of occupational accidents and 2.34 million people die in the year due to accidents and occupational diseases, in Latin America the challenge is huge and the figures alarming, so much so that the figures indicate that for every 100 000 workers 11.1 fatal accidents are recorded (3).

Due to these frightening figures and to reduce workplace accidents, preventive work has been implemented with the systems, organizations are carrying out all the instructions to improve the results of accidents which leads to an increase in productivity and will impact the sector and the finances of the industry (4).

The pandemic in Colombia increased the use of the Internet from 35 % to 64 % which allowed the generation of new forms of work environments giving continuity to the development of the sector, allowing the development of new forms of teleworking at a global level (5).

Occupational health is directed to the promotion and prevention of the health of the workers and the capacity that they have in developing a healthy environment understood to prevent injuries and diseases related to the exercise of its work (6).

Thus, the present study investigated the importance of the occupational health and safety system during the COVID-19 pandemic, through a systematic review of scientific literature published in the last five years.

METHOD

The methodological design under which the present systematic review was developed corresponds to descriptive research based on the analysis of documents under the quantitative approach. The search was conducted through the databases Web of Science, Science Direct, EBSCOhost, and Scopus, carried out in the period (2018 - 2022).

For accuracy, the search was focused on the words: occupational health, safety, and health, safety and health at work, occupational safety and health, SGSST (Sistema de Gestión de Seguridad y Salud en el Trabajo), and COVID-19, after applying all filters the sample unit was composed of 36 articles of which, taken from the primary and secondary source, publications in Spanish, English, Portuguese.

Inclusion criteria

The aspects taken into account for the inclusion criteria focused on the analysis of those articles that were published in the last five years, taking into account the words used for the precision of the search. Articles were included in Spanish, Portuguese, and English since these are the languages that predominate in the articles, as well as those that bring together information related to occupational safety and health aspects.

Exclusion criteria

Articles that were not the product of research results, books, book chapters, essays, as well as any material that did not take into account the search words of this research study were not taken into account.

Search strategy

At the beginning of the search for the exploration of documents (7), it was focused on exploring the mentioned databases according to the opportunity and publications associated

with the area of interest, taking into account the scientific publications that were published in the last five years, including articles in Spanish, Portuguese, and English. The search included variables related to the occupational health and safety management system.

Table 1. Information search terms

“Conditions” and “Labor” or = “workers” not = “unemployed” “health” and “occupational” or = safety not = “development” “prevention” and “work environments” not = “activity” “accident analysis” and “wellbeing” not = “Exposure” “occupational safety” and “personal protection” not = “dangerous driving” “safety management” and “occupational safety” not = “digital safety” “adult wellbeing” and “SG-SST” not = “well-being in children” “occupational incidents” and “risks” not = “patients” “Condições” and “Trabalho” or = “trabalhadores” not = “desempregados” “saúde” and “trabalho” or = segurança not = “desenvolvimento” “prevenção” and “ambientes de trabalho” or = “atividade” not = “análise de acidentes” and “bem-estar” not = “Exposição” “segurança ocupacional” “Condiciones” and “Laborales” or = “trabajadores” not = “desempleados” “salud” and “ocupacional” or = seguridad not = “desarrollo” “prevención” and “entornos laborales” not = “actividad” “análisis de accidentes” and “bienestar” not = “Exposición” “seguridad ocupacional” and “protección personal” “COVID-19” not = “manejo peligroso” “gestión de la seguridad” and “seguridad ocupacional” not = “seguridad digital” “bienestar adulto” and “SG-SST” “Pandemia” not = “bienestar en niños” “incidentes laborales” and “riesgos” not = “pacientes”

The selection of this information and the search of the articles reviewed and the advances reported in the databases Web of Science, Science Direct, EBSCOhost, and Scopus, through the use

of Boolean operators in the formulation of the equations (Table 2), which serves to analyze the exploration process that helps to determine the research work.

Table 2. Search equations

Databases	Database search equations
web of Science	"Health - Safety" and "COVID-19" or = "Occupational health" not= "digital safety" "Occupational accidents" and "Working conditions" not= "occupational therapy" "Occupational safety" and "SG-SST" or= "management system" not= "Quality system". "Salud - Seguridad" and "COVID-19" or = "Salud ocupacional" not= "seguridad digital" "Accidente laborales" and "Condiciones laborales" not= "terapia ocupacional" "Seguridad laboral" and "SG-SST" or= "sistema de gestión" not= "Sistema de calidad"
Science Direct	"Labor conditions" not= "occupational therapy" "Occupational safety" and "SG-SST" or= "management system" not= "Quality system" "Health - Safety" and "COVID-19" or = "Occupational health" not= "digital safety" "Occupational accidents" "Condiciones laborales" not= "terapia ocupacional" "Seguridad laboral" and "SG-SST" or= "sistema de gestión" not= "Sistema de calidad" "Salud - Seguridad" and "COVID-19" or = "Salud ocupacional" not= "seguridad digital" "Accidente laborales"
EBSCOhost	"safety" and "occupational" or= "organizational" not= "digital safety" "safety" and "occupational health" or = organizations not= "digital safety" "accidents" and "occupational" or= "organization" not= "occupational disease" "accidents" and "occupational" or= "organization" not= "occupational disease" "seguridad" and "laboral" or= "organizaciones" not= "seguridad digital" "seguridad" and "salud ocupacional" or = organizaciones not = "seguridad digital" "accidentes" and "laborales" or= "organización" not= "enfermedad laboral"
Scopus	"systems" or= "occupational" not= "quality system" "safety" and "occupational health" or= organizations not = "digital security" "health" and "occupational" or = organizations not= "Schools" "safety" and "health at work" or = "organization" not= "home" "SG-SST" and "sistemas" or = "ocupacional" not= "sistema de qualidade" "segurança" and "saúde ocupacional" or = organizações not= "segurança digital" "saúde" and "ocupacional" or = organizações not= "Escolas" "segurança" and "saúde no trabalho" o or = "organização" not= "casa" "SG-SST" and "sistemas" or= "ocupacional" not= "sistema de calidad" "seguridad" and "salud ocupacional" or= organizaciones not= "seguridad digital" "salud" and "ocupacional" or = organizaciones not= "Colegios" "seguridad" and "salud en el trabajo"

Data collection process

The data processing was carried out through the PRISMA methodology (8), established in the literature review of an equivalent topic to draw a succession of conclusions taking into account the details of the search, covering the areas of

interest, based on the scientific contributions made by expert researchers. Thus, from this systematic review, contributions are made in the area of occupational safety and labor development through occupational safety and health management systems (9).

Table 3. Cross-references of search terms in the databases

Crosses/ databases	Web of Science	Science Direct	EBSCOhost	Scopus	Total
"Health" and "Safety" or = "Occupational" not= "Digital Security".	356	4 580	1 034	384	6 354
"Health" and "Occupational" not= "Occupational therapy".	20	595	491	46	1 152
"accidents" and "occupational" or "conditions" not= "occupational disease".	4	187	125	18	334
"conditions" and "labor"	4	631	584	79	1 298
"seguridad" and "salud" or "en el trabajo" or= "Laboral" not "seguridad digital".	60	2 769	106	26	2 961
"SG-SST" or "occupational safety and health management system" not "quality system".	2	1 179	40	5	1 226
"System" and "management" not "quality system".	67	2 600	1 945	254	4 866
Total	513	12 541	4 325	812	18 191

Selection of studies

The selection of the articles was made taking into account the selection filter in the last five years taking into account the variables of the study, consecutively excluding studies that did not meet the criteria and those texts that were not complete or available.

monitoring and control, which is why the importance of the creation of COPASST (Comité Paritario de Seguridad y Salud en el Trabajo) is responsible for monitoring and promoting standards related to safety and health at work, developing the organization in a culture of prevention and care that will be essential for each area of the organization to meet the expected objectives (45).

RESULTS

Categories of analysis

Effectiveness of the joint occupational safety and health committee

The organizations responsible for ensuring health and safety at work must invest in their employees and intervene in the processes for

The application of the system, the approval, and compliance of the Committee has shown a decrease in individual risks derived from the preventive culture that has achieved the decrease of occupational accidents, discharging the companies, the society, and the members of the organization in the concern of occupational health and assuming this responsibility the committee (46).

Table 4. Item identification, elimination, and selection process

Equation	Databases	No filter	No access	Revisions/ incomplete/ duplicates	Do not meet Criteria	Selection
"Health" and "Safety" or = "Occupational" not = "Digital Security".	Web of Science Science Direct EBSCOhost Scopus	6 535	3 802	854	2 604	5
"Health" and "Occupational "not= "Occupational therapy".	S c i e n c e Science Direct EBSCOhost Scopus	1 152	446	92	712	5
"accidents" and "occupational" or "conditions" not= "occupational disease".	S c i e n c e Science Direct EBSCOhost Scopus	334	149	55	178	1
"conditions" and "labor"	S c i e n c e Science Direct EBSCOhost Scopus	1 298	525	48	565	0
"seguridad" and "salud" or "en el trabajo" or="Laboral" not "seguridad digital".	S c i e n c e Science Direct EBSCOhost Scopus	2 961	1 910	390	1 213	13
"SG-SST" or "occupational safety and health management system" not "quality system".	S c i e n c e Science Direct EBSCOhost Scopus	1 226	834	150	562	9
"System" and "management" not "quality system".	S c i e n c e Science Direct EBSCOhost Scopus	4 866	2 056	298	2 533	5
Total		18 191	9 722	1 887	8 367	38

Culture of Prevention of occupational health and Safety at Work

The organizations must work not only in implementing the COPASST but in being able to internalize in each of the workers the clear objectives and practices of the committee and integrate them to generate a culture of prevention enriching the beliefs shared with each member of the entity to promote better health conditions at work to reduce occupational diseases and accidents (47).

The culture of prevention and care should be related to each of the professionals who are part of the system working in health promotion, risk prevention, medical care, and training, directly influencing these aspects to improve the quality of services in terms of customer satisfaction and achievements internally with each of the workers allowing this bidirectionality working in an environment where all the necessary tools are offered to provide the necessary care and where the customer feels that he is being part of the transforming system (48).

Data extraction

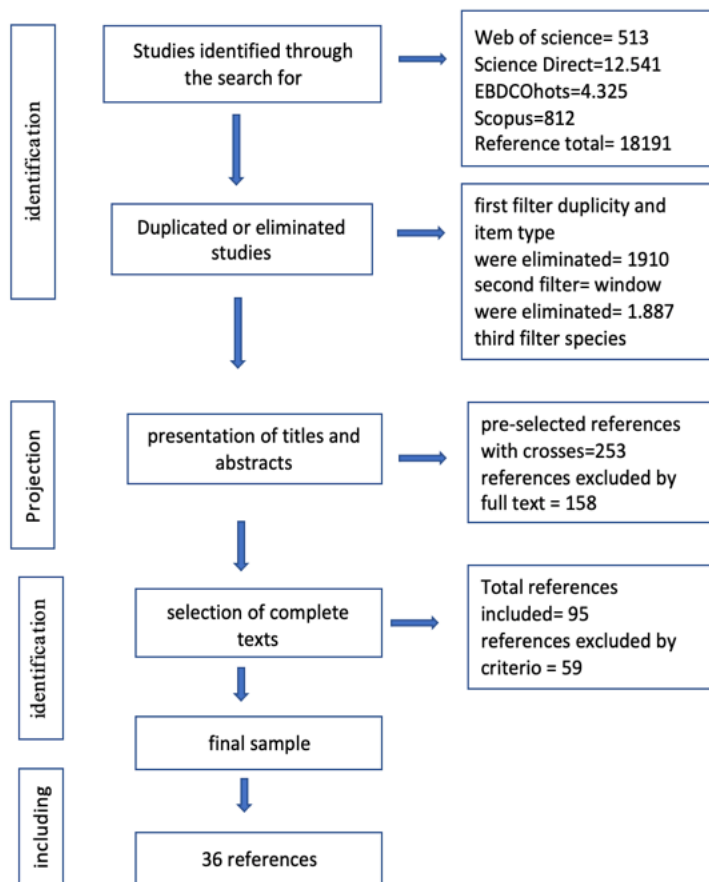


Figure 1. Flow chart of the study selection process.

Occupational health plays a fundamental role in the commitment to achieve an adequate implementation of prevention measures to create better health conditions and reduce accidents and occupational diseases, so it should be clear its important role in the crisis processes in organizations such as the COVID-19 pandemic were the protagonists of the timely detection to prevent the sequelae of the disease (49).

Role of occupational health in the Pandemic

Occupational health and safety are charged with establishing a safe workplace that can

eliminate accidents or fatalities, such accidents can not only cause those injuries, but material losses for both workers and employers and such events can disrupt the service delivery process. The pandemic has been one of the great challenges for the system due to the non-use of safety equipment, the non-acquisition of safety equipment and the high level of work stress, which led to an additional effort on the culture of understanding and use of personal protective equipment and the process of dissemination of health messages to provide information concerning care (27).

Table 5. Results obtained

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
COVID-19; Professionals; Occupational health; Primary health care; Patient safety; Second victims	Professionals safety as prerequisite for patient safety	https://doi.org/10.1016/j.aprim.2021.102216	An analysis was made of the main risks and damages suffered by professionals in primary care, and we provided keys to contribute to their protection in similar situations in the future	Science Direct	(10)
Social security Occupational Health and Safety Health System Health policies	Welfare State and public health: the role of occupational health	https://doi.org/10.1016/j.gaceta.2017.07.007	This study emphasizes reports on how occupational health must meet the challenge of health promotion, prevention, and care of injuries, illnesses, and, above all, disabilities, based on better coordination of prevention services.	Science Direct	(11)
Strategic productivity management Small and medium-sized enterprises (SMEs)	Occupational safety and health management systems as a component of labor productivity	https://doi.org/10.1016/j.procs.2022.07.098	The degree of commitment of the strategic management in promoting the effectiveness of occupational health and safety management programs (OHSMS) is necessary to consolidate the processes for the adoption and awareness of these programs by employees that promote labor productivity.	Science Direct	(12)
Management system, health, intensive care occupational safety, and health, occupational health, teleworkers, teleworkers	Health and safety management system to ensure the operability of self-protection plans in intensive care units.	https://doi.org/10.1016/j.medin.2018.02.010	Healthcare organizations must go beyond compliance with current regulations and move towards a proactive system model to achieve comprehensive safety, through the development of management systems that address procedures and processes to ensure the safety and health protection of users and healthcare professionals.	Science Direct	(13)

Continued in page S422...

...continuation Table 5. Results obtained from page S421

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Telework, occupational safety, and health, occupational health, teleworkers, teleworkers	Occupational Health and Safety in Teleworking in Colombia	https://doi.org/10.1016/j.medin.2018.02.010 https://doi.org/10.1016/j.medin.2018.02.010	The management of safety and health at work for autonomous teleworkers is a starting point to develop methodologies that facilitate companies that are implementing telework and OSH SG, generating simple and systematic processes that provide support to the leaders of the processes of the area.	EBSCOhost	(14)
Design Ergonomics Anthropometrics	Anthropometric characteristics of Chilean workers for ergonomic and design purposes	https://doi.org/10.1080/00140139.2018.1540725	The anthropometric characteristics of the workers were described taking into account measurements based on ISO 7250 and ISO 15535 to ensure the highest possible standards, and a total of 2946 workers, aged between 18 and 76 years	Web of Science	(15)
Occupational Safety and Health (SG-SST) Compliance with management systems Decree 1072	Development of decree 1072 of 2015, as a regulatory factor of practices in the field of construction for the prevention of occupational accidents with MHF Construark SAS, carried out during 2020 in Bogota.	https://doi.org/10.16925/2357-6014.2021.02.11	Establish the level of compliance in the implementation of the SGSST, to identify the determining factors that negatively affect this process.	Web of Science	(16)
Digital, workplace safety in smart cities, Organizational safety management, Safety governance Occupational health, and safety.	Intelligent occupational health and Safety for a digital age and Its Place in Smart and sustainable cities	https://doi.org/10.3934/mbe.2021436	Occupational health and safety (OHS) is an essential aspect to consider in the design of a smart city and its digital ecosystems, yet it remains imprudent in the frameworks of most smart cities, despite the need for a specific space for smart OHS.	Web of Science	(17)
Occupational Health and Safety Legislation Legal	Occupational health and safety compliance management. A review of the literature	https://doi.org/10.1016/j.ssci.2019.08.033	Provides information on how compliance and non-compliance with legislation influence the day-to-day	Science Direct	(18)

Continued in page S423...

...continuation Table 5. Results obtained from page S422

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Compliance Safety Rules Safety Regulations Review	Regulatory advances in the Occupational Safety and Health Management System (OSH-SG SST).	https://doi.org/10.18041/0124-0102/a.32.5523	management of health and safety in companies	EBSCOhost	(19)
Laws; Labor rights; Equality; Equality; Protection.	Development of occupational safety and health management systems in Colombia since Decree 1072: a systematic review.	https://doi.org/10.15332/19905080/00140139.2018.1540725	Evaluate the state of the art in the development and implementation of the SG-SST in Colombia, aimed at the control of occupational hazards and risks focused on the prevention of occupational accidents and occupational diseases.	EBSCOhost	(20)
Development; management system; occupational health and safety; implementation; occupational health.	Safety and Health Conditions in the Workplace of Teleworkers: Systematic Review.		Advances in new information and communication technologies allow new work environments to be generated, thus favoring the business sector to find spaces for the employability of new workers, who, due to their competitive, economic, time, compliance, and social environmental conditions, among others, assume a competitive role from a place other than the traditional workplace.	EBSCOhost	(21)
Teleworking, Legislation, Occupational Health, Advantages					

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Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Public policy, occupational health, occupational health public policies, occupational risk prevention program, occupational hazards, Colombia.	Public policy on occupational safety and health: the Colombian case	https://doi.org/10.11144/Javeriana.rgsp17-35.pps	The objective of this review is to present the development of the Colombian public policy on occupational safety and health, showing the international guidelines postulated by the ILO and the WHO, their deployment in Ibero-American strategies, and the application of the public policy in the national occupational safety and health programs.	EBSCOhost	(22)
Organizational Culture Risk Management Workplace Occupational Health Telework	Teletrabajo: Gestión de la Seguridad y Salud en el Trabajo en Colombia/Teleworking: Occupational Health and Safety Management in Colombia.	https://doi.org/10.12961/apr.2020.23.01.03	Companies with teleworkers for risk management must improve through the adjustment of some of the components of the management system. The main adjustments to be made involve information management and technology innovation applied to the organization and planning, implementation, and evaluation of the management system of safety and health at work.	EBSCOhost	(23)
Quality Decree 1072 of 2015 ISO 9001:2015 occupational health and safety integrated management system	Integration of the occupational health and safety management system into the quality management system in Colombian national public entities.	https://doi.org/10.15332/s2145-1389.2018.0001.02	For the implementation of an integrated management system, the lack of resources, the organization's resources, and the differences in the standards were identified. This methodology seeks to carry out activities with the minimum resources necessary for its management.	EBSCOhost	(24)
Occupational Health and safety management system (OSHMS) construction companies	Diagnosis of the implementation of the sg-sst in construction companies in Colombia.	https://doi.org/10.15332/24631140.5943	The construction companies confirm that it is important and necessary to have a methodology that allows them to implement the sg-sst in the projects they develop with greater ease, agility, and efficiency to obtain greater coverage and reception by all stakeholders, achieving	EBSCOhost	(25)

Continued in page S425...

...continuation Table 5. Results obtained from page S424

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Coronavirus; COVID-19; Health care personnel; Occupational exposure; Occupational health; Health care workers	Occupational safety and health in the context of the covid-19 pandemic: An exploratory review.	https://doi.org/10.15446/RSAP.V22N3.87238	the continuous improvement of the system. Healthcare workers are the most exposed workforce. Accompaniment, coaching, and training in relation to patient care and the use of personal protective equipment are essential to reduce transmission among healthcare workers. In other work activities, social distancing is the standard measure for transmission mitigation, as well as for continuous disinfection of workplaces.	Scopus	(26)
Occupational health and safety management, COVID-19, occupational stress, COVID-19, work stress	Implementation of occupational health and safety (OHS) management system to work stress among healthcare workers during the COVID-19 pandemic at Daya Regional General Hospital, Makassar.	https://doi.org/10.473071/GMC.2022.130.4.3	The continuous work faced by healthcare workers during the COVID-19 pandemic is likely to cause stress. It was possible to analyze the application of the OSH management system to cope with stress in healthcare workers during the COVID-19 pandemic at Daya Regional General Hospital in Makassar City in 2022.	Scopus	(27)
Technology; wellness; flexible work arrangements; health and safety; right to disconnect; working time registration	How to ensure employee well-being in the digital age?	https://doi.org/10.7238/IDP.V0135.392944	Technology and flexible work arrangements have potentially positive effects on employee well-being by promoting autonomy, work-life balance, and reduced role conflict and stress.	Scopus	(28)
Occupational health; Organizational maturity; Problems; Safety management; Safety management	Occupational health and safety management: Maturity and minimum standards in district public entities in Colombia.	https://doi.org/10.37960/rvlg.v25i3.33359 DOI	This article shows the relationship between maturity and the standards of public entities. Entities must strive to comply with the legal requirements associated with the system and at the same time establish strategies for continuous improvement in aspects such as the	Scopus	(29)

Database

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...continuation Table 5. Results obtained from page S425

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Strategic management strategies Small and medium-sized enterprises (SMEs)	Occupational safety and health management systems as a component of labor productivity	https://doi.org/10.1016/j.procs.2022.07.098	strategic analysis of the system and the quality of work life. The objective of this article was to analyze the occupational safety and health management system (OSHMS) as a component of labor productivity in small and medium-sized exporting companies (SMEs) in the metal-mechanic sector in Barranquilla-Colombia.	Scopus	(12)
Diagnostic Occupational Health and safety management System	Occupational Health and Safety Management System	https://doi.org/10.4067/S0718-7642019000400001	Explanation and orientation of occupational health and safety standards for a real transition from Occupational Health Program to Occupational Health and Safety Management System, at the highest level of implementation for companies in the various economic sectors that manage to build a feasible management system, adjusted to their needs, which effectively prevents accidents and illnesses of workers caused by working conditions.	Scopus	(30)
Applied research; applied research; formative research; methodology; occupational safety; safety at work	Safety and health at work, perspectives of methodological research.	https://doi.org/10.47307/MC.2022.1304.13	The purpose of this document was to identify the methodological perspectives applied in Occupational Safety and Health research, as a contribution to the social appropriation of knowledge, within the department of Tolima from 2010 to 2020.	Scopus	(31)
Management; Management system; Occupational risks; Occupational health;	Analysis of the job and the occupational health and safety professional	https://doi.org/10.37467/revhuman.v11.4111	The objective of this article was to carry out an analysis of the work of the occupational health and safety	Scopus	(32)

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...continuation Table 5. Results obtained from page S426

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Occupational health; Occupational safety and health			professional and specialist of a group of graduates of this discipline, this process is based on the analysis of four dimensions, the first focused on the demographic part, the second on the socio-work, the third on the barriers that can arise in the Management of Safety and Health at Work.		
Diagnostics; Manufacturer; Regulations; Occupational health and safety; Standards; Diagnosis; Standards	Analysis of the implementation of occupational safety and health in the manufacturing sector in Valledupar.	https://doi.org/10.15332/246314435-2021-601	The study focused on the development of a diagnosis of occupational health and safety conditions in manufacturing companies, based on the application of two instruments that focused mainly on identifying the socioeconomic conditions of workers and determining the state of compliance with minimum occupational health and safety standards.	Scopus	(33)
Cost evaluation promotion and prevention occupational health and safety occupational health and safety management system	Methodology of costs of promotion and prevention in occupational safety and health for Colombia.	https://doi.org/10.15332/2463140.7791	The aim was to design a methodology to evaluate the costs of promotion and prevention (P&L) in occupational safety and health (OSH) for Colombian companies, as a contribution to the management in this area and the vision of P&L costs.	EBSCOhost	(34)
Employee wellness human resources managers workplace	Influence of suffering at work on health, occupational safety, and professional performance.	https://doi.org/10.3232/UBR.2022.V19.N4.02	The article offers an innovative look at the under-researched topic of suffering at work to discover what has been done, what needs to be changed, and what is yet to come in the field of suffering in companies.	EBSCOhost	(35)

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Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Changes work management occupational health safety	Change management in the framework of occupational safety and health.	https://doi.org/10.15332/24631140.7798	This study was responsible for investigating the organizational culture, working and health conditions, and the socialization of those involved through a training program. Regarding external factors, the importance of reviewing current legislation and making the necessary adjustments to implement management systems was identified.	EBSCOhost	(36)
Occupational Risk Prevention	Preventive Effectiveness of occupational health and safety plans	https://doi.org/10.12961/apr.2022.25.03.08	This is a novel investigation, which is unprecedented, largely due to the inaccessibility of the data, which had to be consulted on-site at the various offices of the labor authority, and to the number of PSTs consulted.	EBSCOhost	(37)
Cost evaluation prevention occupational health and safety occupational health and safety management system	Criteria for the evaluation of occupational safety and health costs: a literature review	https://doi.org/10.15332/24631140.6671	This study made it possible to identify that studies on occupational safety and health that include cost evaluations are currently being carried out in the world. In addition, it was possible to determine the theoretical references that will contribute to the construction of a cost evaluation methodology for occupational safety and health: direct costs, indirect costs, and indicators (economic evaluations); and the analyses that have been made of the different criteria established by each one.	EBSCOhost	(38)
Management Occupational health and safety Psychosocial risks	Psychological health and safety at work: management of psychosocial	https://doi.org/10.15332/24631140	This research is a tool for Colombian organizations to incorporate into their organizational management and	EBSCOhost	(39)

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Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
	hazards and risks. Research and regulatory overview.		occupational health and safety management strategies, processes, and actions for psychological health and safety that promote occupational well-being and the promotion and protection of the physical and psychological health of workers and the promotion and protection of the physical and psychological health of workers.		(32)
Small business occupational safety social security	Perceptions of occupational safety and health systems in textile organizations in Medellín (Colombia): a qualitative analysis.		The conclusion is that there is a need to strengthen the role played by the labor risk management companies in managing the system's funds and in the processes of accompanying and advising the companies on the adoption of these initiatives, which are not only mandatory by law but also necessary to guarantee the quality of life of the working population.	EBSCOhost	(40)
Products chemistry risk	Analysis of occupational health and safety practices in the handling of carcinogenic chemicals and substances in the laboratories of the Instituto Tecnológico Metropolitano-ITM.		it was determined that the substances analyzed are indeed carcinogenic, where most of the substances determined as carcinogenic produce malignant neoplasia of the bronchus and lung or, in other words, bronchial cancer and lung cancer, respectively.	EBSCOhost	(41)
Control measures occupational health and safety management system	Selection of control measures in Occupational Health and Safety Management Systems using metaheuristics.		Achieve a maximum reduction of risk levels, a fact that is conditioned by budgetary planning and restrictions of nature inherent to the implementation of an Occupational Health and Safety Management System (OSHMS).	EBSCOhost	(42)

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...continuation Table 5. Results obtained from page S429

Variable/keyword crosses	Title	DOI	Apported	Database	Authors/ year
Quality of life; occupational disease; management; prevention; health; safety.	Occupational health and safety management system, MSMEs in Sincelejo, Colombia	https://doi.org/10.22267/rtend.222302.206	The results showed the relevance of unifying efforts for monitoring, resource management, and effective information for businessmen on the subject. The study allowed concluding the reality of a weak occupational health and safety system and the lack of knowledge of the regulations.	EBSCOhost	(43)
Environmental management system quality management system occupational health and safety management system	Integration of quality, environmental and occupational health and safety management systems in a national public entity of the finance sector.	https://doi.org/10.15332/s2145-1389.2018.0002.08	The aim of this article is to propose a methodology to integrate the quality management system (QMS), the environmental management system (EMS), and the occupational health and safety management system (OHSMS) in a national entity of the finance sector.	EBSCOhost	(44)

With the various existing factors that affect the health of workers, COVID-19 was one more where it was possible to work on the promotion and maintenance of the physical and mental well-being of each of the employees through the adoption of the identification of risks, understanding that the pandemic brought with it the presentation of numerous factors that affected the health of workers. For the pandemic to be carried out by the actors of health care, basic knowledge about occupational health was required, which allowed them to act within the process protocols in medical care helping to specify the factors associated with prevention and care measures (50).

The challenge of the pandemic, apart from the integral attention of the patients, the care at home, and others were based on the health institutions in the appropriation of programs and practices that contributed to generating a set of beliefs, knowledge, values, experiences, and skills that will lead the employee to adopt a series of habits aimed to reduce the accident rate and the occupational disease caused by the virus, taking with these new habits to the use of the safety measures provided (51).

DISCUSSION

Every organization must guarantee adequate conditions so that its employees can perform their work without putting their physical or mental health at risk. The pandemic made it possible to understand the importance of implementing the health and safety system and its responsibility in achieving the adequate implementation of isolation measures for all persons who became ill with the virus (49).

Every challenge is different when talking about workers' safety and the health emergency was one of them, renewing the way of seeing safety and health at work, reinforcing the use of biosafety protocols, where the existence of direct exposure to infected and asymptomatic people was latent. Because of this, it was essential to generate surveillance protocols to generate a culture of self-care and achieve the maintenance of the strategy by determining actions aimed at mitigating the spread of the virus (52).

It is important to mention that Personal Protection Equipment (PPE) that was part of the health care of workers during the pandemic and proper hand hygiene was disclosed as the most effective strategy to prevent infections associated with the pandemic so it was essential that within organizations there was the availability of water, soap, alcohol-based gel or disinfection supplies that contributed to the use of the technique for the prevention of infection and that was difficult to access for many workers by factors such as shortage of raw materials, lack of resources or lack of knowledge of the measures (53).

CONCLUSIONS

With the pandemic, occupational health and safety acquired greater relevance in organizations to save lives, likewise, international commitments were acquired towards personal protection elements thus reducing the contagion and helping to raise awareness of the use of personal protection elements associated with the performance of their activity, thus generating a culture of health care.

The above leads to the knowledge of the close relationship between the worker's health and the performance of their work, the organizations must direct the processes and institutional policies to comply with the objectives and be able to adopt safe workspaces that prevent the occurrence of risks inherent to the position.

The major challenge of occupational health and safety during the pandemic was to maintain at home the prevention, health care, and awareness of latent risk exposure, in which it was essential to adapt to change, maintenance of workspace, cleaning, active breaks, electrical hazards, among others, which contributed to self-care, health and safety of employees.

REFERENCES

1. Peralta D. Integration of occupational health and safety management system in the quality management system in Colombian public entities of national level. *SIGNOS*. 2018;10(1):39-56.
2. Blanco A, Domínguez A. Regulation of occupational welfare: Between legislation and corporate social responsibility. *Rev Esp Sociol*. 2020;29(2):367-384.

3. International Labour Organization. Available at: <https://www.ilo.org/americas/temas/salud-y-seguridad-en-trabajo/lang-es/index.htm>
4. Obando J, Sotolongo M, Villa E. Safety and health performance evaluation in a printing company. *Rev Indust Engine*. 2019;136-147.
5. Estupiñan L, Villamil H, Jimenez E. Safety and Health Conditions in the Workplace of Teleworkers: Systematic Review. *Rev Am Thought*. 2019;12(23).
6. Alvares S, Riaño M. The public policy of safety and health at work: the Colombian case. *Rev Geren Polít Salud*. 2018;35.
7. Hutton B, Catalá-López F, Moher D. The extension of the PRISMA statement for systematic reviews incorporating network meta-analyses: PRISMA-NMA. *Med Clin (Barc)*. 2016;(xx):10-14.
8. Bravo-Toledo R. The PRISMA 2020 statement: An updated guide for publishing systematic reviews. *PLoS Med*. 2021;1-15.
9. Barrios-Serna K, Orozco-Núñez D, Pérez-Navas E, Conde-Cardona G. New PRISMA 2020 version recommendations for systematic reviews and meta-analyses. *Acta Neurológica Colomb*. 2021;37(2):105-106.
10. Torijano Casalengua M, MaderuelomFernández J, Astier Peña M, Añel Rodríguez R. La seguridad de los profesionales como condición indispensable para la seguridad de los pacientes. *Aten Primaria*. 2021;53(Suppl 1):102216.
11. Benavides F, Delclós J, Serra C. Welfare state and public health: the role of occupational health. *Rev Gac Saint*. 2018;32(4):377-380.
12. Camargo-Acuña G, Guzmán-Castillo S, Payares-Jimenez K, Garizabalo-Davila C, Sukier H, Gómez-Charris Y. Occupational safety and health management systems as a component of labor productivity. *Procedia Computer Science*. 2022;203:667-672.
13. López-Gobernado M, Villalba Gil D, Hernández J. Health and safety management system to ensure the operability of self-protection plans in intensive care units. *Med Intensiva (Engl Ed)*. 2018;42:457-457.
14. Abril Martínez LP, Abril Martínez MC, Abril Martínez SC. Seguridad y salud en el trabajo en teletrabajo autónomo en Colombia. *SIGNOS-Investigación en Sistemas de Gestión*. 2019;12:83-101.
15. Castellucci H, Molenbroek F, Martinez M. Anthropometric characteristics of Chilean workers for ergonomic and design purposes. *Rev Ergonomics*. 2019;62:459-474.
16. Tabares D. Development of decree 1072 of 2015, as a regulatory factor of practices in the field of construction for the prevention of occupational accidents with MHF Construark SAS, carried out during 2020 in Bogota. *Rev Ingeniería Solidaria*. 2021;17.
17. Sanchez-Segura M, Duarte-Peña G, de Amescua A, Medina-Dominguez F, López-Almansa E, Barrio Reyes E. Smart occupational health and Safety for a digital era and its place in smart and sustainable cities. *Math Biosci Eng*. 2021;18(6):8831-8856.
18. Salguero F, Pardo MC, Martínez M, Rubio J. Management of legal compliance in occupational health and safety. A review of the literature. *Safety Science*. 2020;121:111-118.
19. Morales J, Bermejo J. Normative advances in the Occupational Health and Safety Management System - Sg Sst. *Rev Advocatus*. 2019;32:51-63.
20. García D, Navarro K, Parra L. Development of occupational safety and health management systems in Colombia since Decree 1072: A systematic review. *Rev Via Inveniendit et Iudicandi*. 2020;15(2):37-57.
21. Estupiñan L, Villamil H, Jimenez E. Occupational Safety and Health Conditions of Teleworkers: Systematic Review. *Rev Am Thought*. 2019;12.
22. Álvarez S, Riaño M, The public policy of safety and health at work: the Colombian case. *Rev Pontificia Universidad Javeriana*. 2018;17.
23. Valero I, Riaño M. Telework: Management of Safety and Health at Work in Colombia. *Rev Arch Preven Riesgo Lab*. 2020;23:22-33.
24. Peralta Cruz D, Guataqui Cervera S. Integración del sistema de gestión de la seguridad y salud en el trabajo en el sistema de gestión de calidad en las entidades públicas colombianas de orden nacional. *SIGNOS*. 2018;10:39-56.
25. Barrios Y. Diagnosis of OSHMS implementation in pioneering construction companies in Colombia. *Rev Signos*. 2020;12:149-159.
26. Betancourt-Sánchez L, Ochoa-Gelvez E, Velásquez-Bernal C, Rozo-Silva YA, Quiroga-Vargas D. Occupational safety and health in the context of the COVID-19 pandemic: An exploratory review. *Rev Public Health*. 2020;22:381-388.
27. Efendy A, Djajakusli R, Muis M, Wahyu A, Hidayanty H, Indarty A. Implementation of occupational safety and health (OHS) management for occupational stress among healthcare workers during the COVID-19 pandemic at Daya Regional General Hospital, Makassar. *Gac Med Caracas*. 2022;130(4):696-707.
28. Gines A. How to ensure employee well-being in the digital age? *Rev D'Internet Law and Policy*. 2022;35:1-15.
29. Rodríguez-Rojas Y, Hernández Cruz H, Monroy Silva M. Gestión de seguridad y salud laboral: Madurez y estándares mínimos en entidades públicas distritales en Colombia. *Rev Venez Geren*. 2020;25(3):150-166.

30. Marrugo E, Jotty-Martínez E, Ortiz-Avila L, Gallo-López S. Overview of Occupational Health and Safety in numbers. *J Industrial Neo-Technol.* 2019;30.
31. Loreto Vásquez F, Garrido Raad R, Ramirez Peña M. Seguridad y salud en el trabajo, perspectivas metodológicas de investigación. *Gac Méd Caracas.* 2022;130(4):781-790.
32. Rueda Y, Martínez J, Silva C, García A. Analysis of the work and the professional in safety and health at work. *Internat J Humanities.* 2022;11:1-2.
33. Zambrano C, Mendoza J. Analysis of the implementation of occupational safety and health standards in manufacturing companies in the city of Valledupar. *Rev Brasil Med Trab.* 2021;19:290-298.
34. Ortiz Méndez G. Metodología de evaluación de costos de la Promoción y Prevención en Seguridad y Salud en el Trabajo para empresas colombianas (Tesis de Grado). *SIGNOS.* 2021;14(2).
35. Liberal S, Paredes C, Gismera E, Sastre J. Influence of suffering at work on health, occupational safety and professional performance. *Rev Enterprise and Society of the UCJC.* 2020;19:62-103.
36. Hernández Duarte W. Gestión del cambio en el marco de la seguridad y la salud en el trabajo. *SIGNOS, Investigación en Sistemas de Gestión.* 2022;14(2).
37. Cañamares M. Preventive effectiveness of occupational safety and health plans. *Safety Science.* 2021;143:105.
38. Ortiz Mendoza G. Criteria for the evaluation of costs in occupational safety and health: A literature review. *SIGNOS.* 2021;13(2).
39. Rodríguez Rojas Y. Psychological health and safety at work: Management of psychosocial hazards and risks. Research and normative overview. *SIGNOS.* 2022;14(1).
40. Bram L, Arboleda J. Perceptions of occupational safety and health systems in textile organizations in Medellín (Colombia): A qualitative analysis. *Rev CEA.* 2022;8(17).
41. Mosquera Y, Narváez J. Analysis of occupational safety and health practices in the handling of carcinogenic substances and chemicals in the laboratories of the Instituto Tecnológico Metropolitano- ITM. *Rev Producción + Limpia.* 2019;14:2.
42. Ruiz J, Plaza M, Hernández H. Selection of control measures in Occupational Safety and Health Management Systems using metaheuristics. *Rev Spaces.* 2020;41(45).
43. Alvares D, Astrid E, Jiménez K. Occupational Health and Safety Management System, MSMEs in Sincelejo, Colombia. *Rev Facul Econ Admin Scienc.* 2020;2:178-201.
44. Ruiz A, Batista M. Integration of quality, environmental and occupational health and safety management systems in a public entity of the national order of the finance sector. *SIGNOS.* 2018;10:141-157.
45. Márquez P, Atencio N, Daza M. Analysis of the efficiency of the Joint Committee on Occupational Safety and Health in private organizations in Barranquilla (Colombia) during the second half of 2020. *Rev Labor Gazette.* 2021;27:117-133.
46. Salvador V, Salvador M S, Sánchez A. Trend change analysis of occupational health indicators in Spain, in the period 1995 to 2017. *Rev Industrial Psychol.* 2020;95:39-42.
47. Hernández H, Botero S, Chiquillo J. Occupational health policy for the creation of a culture of occupational safety and health prevention in health care institutions. *Rev Acad Der.* 11(20).
48. López Espinosa GJ, Lemus Lago ER, Valcárcel Izquierdo N, Yeras Alos IB, Beltrán González BM, Pérez Bada E. Identification of learning needs in occupational health by the specialist in General Comprehensive Medicine. *Educ Med Sup.* 2018;32:195-207.
49. Moreno L. Occupational health in the COVID-19 era. *Rev Méd Inst Mex Seg Soc.* 2021;59:151-156.
50. Arteaga-Cuéllar Y, Veliz-Martínez P, Hernández Malpica S, Castro Ladrón de Guevara N, Castro Morejón L, Borges Cabrera PR. Caracterización de la atención a la salud ocupacional en el Policlínico Juan José Apolinaire Pennini. *Cienfuegos, 2018. MediSur.* 2021;19(5):814-826.
51. Hernández H, Botero S, Chiquillo J. Occupational health policy for the creation of a culture of occupational health and safety prevention in health care institutions. *Rev Acad Law.* 2020;11(20).
52. Solorzano-Aquino D, Castillo-Martínez W, Minan-Olivos G, Simpalo-López W. Gestión de la seguridad y salud en el trabajo frente al COVID-19 en una empresa del sector pesquero peruano. *Arch Prev Riesgos Labor.* 2021;24(3):240-251.
53. Narváez Olalla A, Melena Zapata J, Guerrero Gonzalez J, Solís Cárdenas D, Calderón Layedra L, Albán Villacis J, et al. Exposición y riesgo ocupacional de COVID-19 en estudiantes, docentes y profesionales de la salud. *Rev Med Vozandes.* 2020;31(2):33-41.

Obesity paradox and cardiovascular risk

Paradoja de la obesidad y riesgo cardiovascular

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SUMMARY

Obesity, traditionally defined as excess body fat, is a non-communicable chronic inflammatory disease highly prevalent in both sexes, in all age groups, and in different regions globally, which is frequently associated with an increased risk of metabolic and cardiovascular morbidity and mortality. During the last decades, evidence has been growing that suggests the existence of a phenomenon that is currently known as the “obesity paradox”, which exposes that individuals who are overweight or obese have a lower risk of mortality from all causes, an effect that extends to those patients with cardiovascular diseases (CVD), in whom mortality from CV causes is also decreased. However, the published data on the existence or not of this phenomenon are contrasting, so this research seeks to summarize the available epidemiological evidence on the real effect of overweight and obesity on the cardiovascular risk (CVR) of individuals with excess body fat.

Keywords: *Obesity paradox, obesity phenotypes, cardiovascular risk, overweight, body mass index.*

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RESUMEN

La obesidad, tradicionalmente definida como un exceso de peso corporal, se trata de una enfermedad crónica inflamatoria no transmisible altamente prevalente en ambos sexos, en todos los grupos etarios y en diferentes regiones a nivel global, la cual es asociada frecuentemente con un mayor riesgo de morbi-mortalidad metabólica y cardiovascular. Durante las últimas décadas, ha ido en crecimiento la evidencia que sugiere la existencia de un fenómeno que actualmente es conocido como la “paradoja de la obesidad”, el cual expone que los individuos con sobrepeso u obesos, tienen menor riesgo de mortalidad por todas las causas, efecto que se extiende a aquellos pacientes con enfermedades cardiovasculares (ECV), en quienes la mortalidad por causas CV también se encuentra disminuida. Sin embargo, son contrastantes los datos publicados sobre la existencia o no de este fenómeno, por lo que la presente investigación busca resumir la evidencia epidemiológica disponible sobre el efecto real del sobrepeso y obesidad en el riesgo cardiovascular (RCV) de individuos con exceso de peso corporal.

Palabras clave: *Paradoja de la obesidad, fenotipos de obesidad, riesgo cardiovascular, sobrepeso, índice de masa corporal.*

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INTRODUCTION

Obesity is a morbid condition, traditionally defined as excess body weight, estimated in clinical practice through the body mass index (BMI). This is an anthropometric measure that evaluates the relationship between body mass and height (1). From a pathophysiological perspective, obesity results from an energy imbalance, where energy intake is higher than the energy expended, and the excess energy is stored in adipose tissue. However, it is known that body weight gain is multifactorial, where not only the abnormal intake of high caloric food is related to energy imbalance. Habits that lead to a reduction in physical activity at work or home, as well as certain environmental, socioeconomic, and even genetic/epigenetic factors, seem to play a fundamental role in the development of obesity (2-4).

Obesity is a highly prevalent morbid condition in both sexes, in different age groups, and in different regions, particularly in Western countries, where lifestyles and environmental conditions are characterized by obesogenic conditions. The maladaptive impact of obesity on cardiovascular structure, function, hormonal communication, and hemodynamics has played an important role in different cardiovascular diseases (CVD). Among these, we can find arterial hypertension (AHT), coronary heart disease, heart failure (HF), atrial fibrillation (AF), sudden cardiac attacks, and, therefore mortality (5,6).

In this regard, it is well known that obesity represents an important risk factor for CVD-related morbidity and mortality (7,8). However, in recent decades it has become evident that, epidemiologically, not all obese subjects have the same risk of developing cardiovascular events. This opened the way to a new era in nutritional research, focused on what is now known as the "Obesity Paradox", a phenomenon that reveals the possible cardioprotective role of obesity. Studies have shown that overweight or obese subjects with established CVD often have a better prognosis compared to their leaner counterparts with the same CVD (5,6). To explain this phenomenon, it has been proposed that in each BMI category, different metabolic profiles are associated with

different degrees of cardiovascular risk (CVR). It is in this way that the existence of different obesities or phenotypes of obesity is proposed, of which the most common are: the metabolically healthy obese (OBMS) and the metabolically obese/sick or unhealthy normal-weight (NPME), which have a prevalence of 7.27 % and 19.98 %, respectively. This prevalence varies according to the parameters for defining and measuring each phenotype (8-10). OBMS is the obese phenotype without metabolic syndrome and with lower CVR, while NPME is a phenotype defined by a normal BMI but with obesity-related metabolic complications (11).

So far, the available data on the real impact of obesity phenotypes on CVR increase are contrasting. Some authors claim that OBMS is a benign condition with no associated short-term risk; however, other studies document that this obesity phenotype does have a significantly negative impact on long-term CV health (8,12,13). In a prospective study of 8 years of follow-up, it was reported that CVR was not increased in the OBMS group compared to normal weight subjects without dysmetabolic factors (12). Because of this uncertainty, the present review aims to summarize the available evidence on the real effect of overweight and obesity on CVR in individuals with excess body weight.

Obesity Paradox in cardiovascular disease

Traditionally, BMI has been used as an anthropometric marker for the estimation of morbidity and mortality in clinical practice, where a value above 30 kg/m² (obesity) is associated with an undeniably higher risk of cardiovascular morbidity and mortality (14,15). However, several studies have shown that some overweight and obese patients have a better cardio-metabolic prognosis compared to normal-weight subjects, a phenomenon known as the "obesity paradox" (6).

In the early 2000s, Gruberg et al. (16), were the first researchers to describe that overweight or obese individuals had a better prognosis when affected by CVD regardless of gender and smoking compared to their lean counterparts. Subsequent studies have provided further evidence on the apparent protective role of excess fat for overall mortality and cardiovascular mortality in patients affected by various CVD,

such as coronary heart disease, heart failure (HF), atrial fibrillation (AF), and even in other types of chronic noncommunicable diseases such as end-stage chronic kidney disease, chronic obstructive pulmonary disease, and type 2 diabetes mellitus. In this regard, Flegal et al. (17), conducted a systematic review and meta-analysis that included more than 90 observational studies, analyzing 2.88 million subjects, which found that being overweight is associated with lower overall mortality (OR=0,94 IC95 %=0,91-0,96; p<0,05).

However, the possible molecular mechanisms that explain the obesity paradox in CVD are still not completely clear. It is known that overweight individuals produce more stable receptors for tumor necrosis factor-alpha in their adipose tissue and have a greater metabolic reserve, which confers certain cardio-metabolic protection (5,6,18,19). Additionally, overweight or obese subjects with HF have reduced circulating levels of B-type natriuretic peptide (BNP). This allows them to develop symptoms in a shorter period, compared to patients with lower weight, which leads to a timely diagnosis and approach that would reduce the risk of morbidity and mortality. It has been observed that these low levels of BNP in overweight subjects are associated with greater development of lean mass, a factor that also confers protection (20). Likewise, it is necessary to consider that those overweight or obese patients who ended up developing CVD could have avoided them if they had prevented weight gain. Meanwhile, individuals with normal weight who develop CVD may have developed them due to pathophysiological mechanisms different from those associated with obesity, either due to genetic predisposition, sociodemographic factors, lifestyles, or other biological factors specific to the thin individual (5,6,19).

Central (visceral) or peripheral (subcutaneous and/or hip) distribution is another factor that could influence the paradoxically better overall and cardiovascular survival observed in overweight patients compared to lean counterparts (21). Another key factor in paradoxical obesity is the existence of individuals who could well be considered overweight or obese based on their BMI, but whose excess weight is the result of a high percentage of hypertrophic muscle tissue resulting from regular anaerobic physical activity (22). Other factors such as

genetic polymorphism, intrauterine exposure to toxic substances, contamination by endocrine disruptors, air pollution, and even intestinal microbiota also play a determining role in the predisposition to obesity. These factors influence the distribution of adiposity and the cardio-metabolic risk of each phenotype (23,24). Similarly, the obesogenic environment driven by the consumption of high-caloric food and epigenetic modifications that affect the transcription of obesity-related genes is other factors influencing the obesity paradox (25,26).

Coronary heart disease

Although the presence of paradoxical obesity in cardiovascular diseases has been suggested, its existence in coronary heart disease is still under discussion, since studies have failed to demonstrate the protective effect of excess weight on cardiovascular mortality (27). However, it has been evidenced that in obese patients, acute myocardial infarction (AMI) is associated with less severe and complex coronary artery disease, compared to non-obese subjects, suggesting the presence of the obesity paradox in coronary artery disease (28). Thus, in a study of patients who suffered AMI, it was observed that in those with morbid obesity, the unadjusted mortality rate was 3.5 %, while in non-obese subjects it was 5.5 %, this difference being statistically significant (p <0,0001). After adjustment, the odds of mortality remained lower in morbidly obese compared to non-morbidly obese patients (29). Similarly, Bucholz et al. (30), conducted a retrospective study involving 124,981 patients with AMI, reporting longer survival in overweight and obese subjects, even after accounting for younger age and more intensive pharmacological treatment. Likewise, in a systematic review conducted by Romero-Corral et al. (31), which analyzed 250 152 patients with coronary artery disease, it was found that the total mortality risk of coronary artery disease was (RR 0.87 [95 % CI 0.81–0.94]) and of cardiovascular mortality was (RR 0.88 [95 % CI 0.75–1.02]) was lower in overweight and moderately obese patients.

Given these findings, it is important to consider that, epidemiologically, obese and overweight patients who develop coronary artery disease tend to be younger and have a higher left ventricular ejection fraction compared to normal-weight

patients, factors that favor a better prognosis for the patient (16,32,33). Likewise, it should also be taken into account that patients with excess weight usually have more regular access to cardioprotective drugs such as aspirin, statins, or beta-blockers, which could partially explain the reduced hospitalization times and low mortality (34,35).

Heart failure

HF is another very frequent CVD in obese patients; however, these patients seem to have a better prognosis than lean subjects, both in men and women, even when adiposity has been estimated with other anthropometric methods, such as abdominal circumference, hip circumference, or triceps skinfold thickness (36-38). In this context, Littnerova et al. (39), conducted a longitudinal study in 5 057 patients with acute HF, where they found that, after 32 months of follow-up, overweight/obese patients had lower long-term mortality than normal-weight patients (HR 1.36; [IC 95 % 1.26-1.48]). Likewise, Zamora et al. (40), reported that those individuals with elevated BMI who did not have diabetes as a comorbidity had lower cardiovascular and all-cause mortality after 4 years of follow-up (HR 0.76; [IC 95 % 0.58-0.99]). In the same manner, in Curtis et al. (41), which included 7 767 patients with stable HF, it was observed that after 37 months of follow-up, both in overweight patients and in patients with stable HF, it was observed that after 37 months of follow-up, both in overweight patients and patients with (HR 0.88; [IC 95 % 0.80-0.96]) and obese (HR 0.81; [IC 95 % 0.72-0.92]), there was lower mortality for all causes. Similar results were achieved by other authors (42-44).

Several mechanisms have been proposed that could explain the protective role of obesity in HF. Thus, as discussed in the case of coronary heart disease, patients with HF and obesity are usually younger than their thin counterparts. This added to the fact that they can be diagnosed in earlier stages of the disease, due to the presentation of a clinical picture characterized by dyspnea, edema, and/or decreased left ventricular ejection fraction. This phenomenon allows, in one way or another, this group of patients to be treated promptly, with a consequent reduction in the risk of long-term morbidity and mortality (39,40,42-48).

As previously mentioned, the concentrations of BNP are lower in individuals who co-morbidly present overweight and acute or chronic HF, which leads to an earlier clinical presentation with a consequent better prognosis (49). In addition, it is important to note that chronic HF promotes a persistent catabolic state causing cardiac cachexia, which could be remedied by the additional nutritional support provided by obesity (46,50). In this regard, one study found that, in a group of patients with HF, only obese subjects were able to maintain muscle protein balance. In non-obese individuals, higher protein catabolism was observed and, therefore, an increased release of amino acids (51). It should also be taken into account that obese patients usually also suffer from hypertension, which is why they are treated with cardioprotective drugs more intensely than their normal-weight counterparts (52).

Atrial Fibrillation

The association between obesity or overweight and AF has been widely documented and reconfirmed with different anthropometric measures to estimate adiposity, apart from BMI. It has also even been observed that excess weight represents a risk factor for the progression of paroxysmal AF to permanent AF and recurrences (53-55). However, different longitudinal studies have demonstrated the presence of the obesity paradox in subjects with AF, since overall mortality and mortality due to CV causes is lower in obese than in normal-weight subjects. In this sense, Wang et al. (56), conducted a study in 2016 of patients with AF for 12 months, observing that the odds of all-cause mortality and CV mortality were higher in the low weight category (HR 1.57 [IC 95 % 1.02-2.42] and HR 2.01 [IC 95 % 1.76-3.43], respectively) and normal weight (HR 1.53 [IC 95 % 1.76-3.43] and HR 1.53 [IC 95 % 1.03-2.28], respectively) comparing with the overweight category. Likewise, Inoue et al. (57), also conducted a study in 6 379 patients with non-valvular AF, finding lower all-cause mortality in overweight patients (HR 0.60 [IC 95 % 0.37-0.95]; $p=0.029$), after a 2-year follow-up. In the same manner, Sandhu et al. (58), followed 17 913 patients with AF for 1.8 years, reporting a lower risk of all-cause mortality in overweight patients (HR 0.67 [IC 95 % 0.59-0.78]) and obese (HR 0.63 [IC 95 %

0.54-0.74]) compared to subjects with normal BMI; they also found a 31 % reduction in the risk of all-cause mortality and a 28 % reduction in the risk of stroke or systemic embolism in women with high abdominal circumference. Similar results were reported by other authors (59-61). Concerning age, the protective action of obesity in older patients has also been demonstrated, as shown by Yanagisawa et al. (62), in a sample of 413 individuals ≥ 70 years with AF, where obesity was associated with lower mortality (HR 0.35 [95 % CI 0.13-0.89]) and lower need for hospitalization compared to lean counterparts.

In contrast to these findings, other studies reveal that weight loss may rather have a beneficial effect on the onset and progression of AF. In this regard, Berkovitch et al. (63), showed that for every 5 kg of weight loss, the risk of developing AF was reduced by up to 12 % in asymptomatic middle-aged subjects; whereas, Pathack et al. (64), in a prospective study conducted over 12 months, reported that patients with a progressive weight loss of more than 10 % were up to 6 times more likely to maintain sinus rhythm. Thus, the available evidence on the true effect of excess weight on AF patients is discordant, so the estimation of the beneficial factor of the obesity paradox should be personalized in this type of patient.

Obesity Paradox: Defining Different Subtypes of Obesity

The contrasting evidence on the controversial role of obesity in the estimation of CVR could be explained in part by the existence of different phenotypes of obesity. This is based more on the distribution of body fat than on the total percentage of adipose tissue. In this sense, obesity has classically been defined based on BMI, a nutritional anthropometric measure that does not allow estimation of the level of ectopic fat. Similarly, it is not able to differentiate fat mass from lean mass, which promotes the placement in the same category of subjects with anthropometric characteristics, metabolic profiles, inflammatory profiles, or levels of physical activity associated with a good or bad state of health (65). Thus,

the cut-off point defined for discrimination between non-overweight and overweight could allow the overlapping of both categories. This is because the former could include subjects who, although they have a “normal” BMI, are a body fat percentage higher than that of individuals classified as overweight or obese.

In resonance with the above, it has been proposed that the apple body shape in individuals classified as normal weight, where fat is distributed mainly in the visceral adipose tissue, is associated with an adverse cardio-metabolic profile. While the pear body shape in overweight subjects, where the highest percentage of fat is distributed in the subcutaneous tissue and hips, is associated with a healthier cardio-metabolic profile (66). Thus, it is hypothesized that there are different types of obesity phenotypes, each of which could individually explain the phenomenon of paradoxical obesity.

Metabolically Healthy Obesity

In the metabolically healthy obese phenotype (MBO) are those individuals with a high BMI who have a healthy metabolic profile. There is a non-atherogenic lipid profile, where there are low concentrations of pro-inflammatory cytokines, both in plasma and adipose tissue, where peripheral tissues are highly sensitive to insulin, and where there is a lower percentage of visceral adipose tissue and hepatic fat (67,68). In European populations, the incidence of this phenotype varies between 10 % and 30 %, being more frequently observed in the female sex and young individuals (69). This subgroup of patients has a CVR and mortality rate comparable to normal-weight individuals (70). However, other authors have observed that the MBO profile is not an entirely benign phenotype. Because, in studies with long evaluation periods of up to 30 years, it has been observed that these subjects have a higher CVR, a higher probability of chronic kidney disease, and non-alcoholic steatohepatitis (13,71–74). It has even been documented that some subjects who were initially MBO, over the years, acquired metabolic characteristics that turned them into sick individuals (75).

Normopoietic Metabolically Obese

The metabolically obese or diseased normal-weight phenotype (NPME) integrates those subjects with a BMI within the normal range, but who have CV risk factors characteristic of obese diseased subjects (76). Thus, NPME patients are characterized by a pro-atherogenic lipid profile, a pro-inflammatory adipokine profile, a higher amount of visceral adipose tissue, and hyperinsulinemia accompanied by insulin resistance (77). Individuals with this phenotype, whose prevalence can reach up to 20 %, are often characterized by being smokers, sedentary, older, and with obesogenic habits. Underdiagnosis of this phenotype is high because both the patient and the health professional typically underestimate the CVR of individuals with normal weight. In this situation, it has been proposed that in men with BMI > 23.8 kg/m² and women with BMI > 22.5 kg/m², the abdominal circumference is measured, since it has been suggested that the diseased profile of this phenotype is attributable to excess visceral adipose tissue (11.78) < 25.0; overweight, 25.0-29.9; and obese, > or = 30.0 [calculated as weight in kilograms divided by height in meters squared].

Normal-weight Obesity

Normal-weight obesity (NWO) is a phenotype where the individual has a BMI within normal limits with a percentage of body fat mass above 30 %, however, they lack the sick metabolic profile characteristic of the NPME. This phenotype seems to be typical of women, in whom an intermediate pro-inflammatory state between normal-weight and pre-obese subjects has been reported. This early pro-inflammatory condition represents a prognostic factor for CVR and metabolic syndrome, so its diagnosis and timely approach should be emphasized in patients with NWO (79,80).

Sarcopenic obesity (SO)

Sarcopenic obesity (SO) is a phenotype of obesity that is difficult to characterize since there is no established consensus on the specific definition of this condition. However, SO

arises from the coexistence of decreased lean mass, skeletal muscle hyperfunctioning, and a high percentage of adipose tissue, phenomena that are associated with aging. Likewise, it has been shown that obesity and sarcopenia have a synergistic relationship since the metabolic, CVD, and mortality risk is higher in SO compared to that observed in each of these conditions in isolation. In this sense, both obesity and sarcopenia are pathologies that have some risk factors in common, such as a sedentary lifestyle; in addition, the chronic inflammatory state of obesity promotes loss of muscle mass, which further favors the sarcopenic state (81-83).

CONCLUSIONS

The obesity paradox is an epidemiological phenomenon in which excess weight seems to have a protective role in overweight or obese subjects. It also reduces the risk of all-cause and CVD death in patients with CVD such as coronary heart disease, heart failure, or atrial fibrillation. However, the evidence currently available is contrasting, with studies either reinforcing or refuting this axiom. It has been proposed that paradoxical obesity could be partially explained by the existence of phenotypes such as OBMS, NPME, NWO, and SO, each of which has anthropometric characteristics and cardio-metabolic and inflammatory profiles, which individualize CVR. In the absence of a universally shared definition of "obesities", it is difficult to estimate the real burden of each phenotype and its role in the obesity paradox. Hence, more prospective studies with long follow-up periods, where adiposopathy is determined in different ways, are needed. In addition, the evaluation of all possible influencing and confounding factors in the relationship between excess weight and CVR, so that the existence of an obesity paradox can be confirmed.

REFERENCES

1. González-Muniesa P, Martínez-González MA, Hu FB, Després JP, Matsuzawa Y, Loos RJF, et al. Obesity. *Nat Rev Dis Primers*. 2017;3:17034.
2. Faienza MF, Wang DQH, Frühbeck G, Garruti G, Portincasa P. The dangerous link between childhood

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- and adulthood predictors of obesity and metabolic syndrome. *Intern Emerg Med.* 2016;11(2):175-182.
3. Church TS, Thomas DM, Tudor-Locke C, Katzmarzyk PT, Earnest CP, Rodarte RQ, et al. Trends over 5 decades in U.S. occupation-related physical activity and their associations with obesity. *PLoS One.* 2011;6(5):e19657.
 4. Swinburn B, Sacks G, Ravussin E. Increased food energy supply is more than sufficient to explain the US epidemic of obesity. *Am J Clin Nutr.* 2009;90(6):1453-1456.
 5. Lavie CJ, Milani RV, Ventura HO, Romero-Corral A. Body composition and heart failure prevalence and prognosis: getting to the fat of the matter in the «obesity paradox». *Mayo Clin Proc.* 2010;85(7):605-608.
 6. Lavie CJ, Milani RV, Ventura HO. Obesity and cardiovascular disease: risk factor, paradox, and impact of weight loss. *J Am Coll Cardiol.* 2009;53(21):1925-1932.
 7. Molenaar EA, Hwang SJ, Vasan RS, Grobbee DE, Meigs JB, D'Agostino RB, et al. Burden and rates of treatment and control of cardiovascular disease risk factors in obesity: The Framingham Heart Study. *Diabetes Care.* 2008;31(7):1367-1372.
 8. Eckel N, Meidtnr K, Kalle-Uhlmann T, Stefan N, Schulze MB. Metabolically healthy obesity and cardiovascular events: A systematic review and meta-analysis. *Eur J Prev Cardiol.* 2016;23(9):956-966.
 9. Ruderman N, Chisholm D, Pi-Sunyer X, Schneider S. The metabolically obese, normal-weight individual revisited. *Diabetes.* 1998;47(5):699-713.
 10. Wang B, Zhuang R, Luo X, Yin L, Pang C, Feng T, et al. Prevalence of Metabolically Healthy Obese and Metabolically Obese but Normal Weight in Adults Worldwide: A Meta-Analysis. *Horm Metab Res.* 2015;47(11):839-845.
 11. Wildman RP, Muntner P, Reynolds K, McGinn AP, Rajpathak S, Wylie-Rosett J, et al. The obese without cardiometabolic risk factor clustering and the normal weight with cardiometabolic risk factor clustering: prevalence and correlates of 2 phenotypes among the US population (NHANES 1999-2004). *Arch Intern Med.* 2008;168(15):1617-1624.
 12. Hosseinpahan F, Barzin M, Sheikholeslami F, Azizi F. Effect of different obesity phenotypes on cardiovascular events in Tehran Lipid and Glucose Study (TLGS). *Am J Cardiol.* 2011;107(3):412-416.
 13. Kramer CK, Zinman B, Retnakaran R. Are metabolically healthy overweight and obesity benign conditions?: A systematic review and meta-analysis. *Ann Intern Med.* 2013;159(11):758-769.
 14. Jensen MD, Ryan DH, Apovian CM, Ard JD, Comuzzie AG, Donato KA, et al. 2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society. *Circulation.* 2014;129(25 Suppl 2):S102-138.
 15. Global BMI Mortality Collaboration null, Di Angelantonio E, Bhupathiraju S, Wormser D, Gao P, Kaptoge S, et al. Body-mass index and all-cause mortality: Individual-participant-data meta-analysis of 239 prospective studies in four continents. *Lancet.* 2016;388(10046):776-786.
 16. Gruberg L, Weissman NJ, Waksman R, Fuchs S, Deible R, Pinnow EE, et al. The impact of obesity on the short-term and long-term outcomes after percutaneous coronary intervention: The obesity paradox? *J Am Coll Cardiol.* 2002;39(4):578-584.
 17. Flegal KM, Kit BK, Orpana H, Graubard BI. Association of all-cause mortality with overweight and obesity using standard body mass index categories: A systematic review and meta-analysis. *JAMA.* 2013;309(1):71-82.
 18. Lavie CJ, Osman AF, Milani RV, Mehra MR. Body composition and prognosis in chronic systolic heart failure: The obesity paradox. *Am J Cardiol.* 2003;91(7):891-894.
 19. Lavie CJ, Milani RV, Artham SM, Patel DA, Ventura HO. The obesity paradox, weight loss, and coronary disease. *Am J Med.* 2009;122(12):1106-1114.
 20. Das SR, Drazner MH, Dries DL, Vega GL, Stanek HG, Abdullah SM, et al. Impact of body mass and body composition on circulating levels of natriuretic peptides: Results from the Dallas Heart Study. *Circulation.* 2005;112(14):2163-2168.
 21. Sahakyan KR, Somers VK, Rodriguez-Escudero JP, Hodge DO, Carter RE, Sochor O, et al. Normal-Weight Central Obesity: Implications for Total and Cardiovascular Mortality. *Ann Intern Med.* 2015;163(11):827-835.
 22. McAuley PA, Artero EG, Sui X, Lee Dchul, Church TS, Lavie CJ, et al. The obesity paradox, cardiorespiratory fitness, and coronary heart disease. *Mayo Clin Proc.* 2012;87(5):443-451.
 23. Di Ciaula A, Portincasa P. Fat, epigenome and pancreatic diseases. Interplay and common pathways from a toxic and obesogenic environment. *Eur J Intern Med.* 2014;25(10):865-873.
 24. Graff M, Scott RA, Justice AE, Young KL, Feitosa MF, Barata L, et al. Genome-wide physical activity interactions in adiposity - A meta-analysis of 200,452 adults. *PLoS Genet.* 2017;13(4):e1006528.
 25. Swinburn BA, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML, et al. The global obesity pandemic: shaped by global drivers and local environments. *Lancet.* 2011;378(9793):804-814.
 26. Wang B, Gao W, Li J, Yu C, Cao W, Lv J, et al. Methylation loci associated with body mass index,

- waist circumference, and waist-to-hip ratio in Chinese adults: An epigenome-wide analysis. *Lancet*. 2016;388:S21.
27. Chrysant SG, Chrysant GS. New insights into the true nature of the obesity paradox and the lower cardiovascular risk. *J Am Soc Hypertens*. 2013;7(1):85-94.
 28. Cepeda-Valery B, Chaudhry K, Slipczuk L, Pressman GS, Figueredo VM, Lavie CJ, et al. Association between obesity and severity of coronary artery disease at the time of acute myocardial infarction: Another piece of the puzzle in the «obesity paradox». *Int J Cardiol*. 2014;176(1):247-249.
 29. Dhoot J, Tariq S, Erande A, Amin A, Patel P, Malik S. Effect of morbid obesity on in-hospital mortality and coronary revascularization outcomes after acute myocardial infarction in the United States. *Am J Cardiol*. 2013;111(8):1104-1110.
 30. Bucholz EM, Beckman AL, Krumholz HA, Krumholz HM, Dr. Bucholz was affiliated with the Yale School of Medicine and Yale School of Public Health during the time that the work was conducted. Excess weight and life expectancy after acute myocardial infarction: The obesity paradox reexamined. *Am Heart J*. 2016;172:173-181.
 31. Romero-Corral A, Montori VM, Somers VK, Korinek J, Thomas RJ, Allison TG, et al. Association of bodyweight with total mortality and with cardiovascular events in coronary artery disease: A systematic review of cohort studies. *Lancet*. 2006;368(9536):666-678.
 32. Kang WY, Jeong MH, Ahn YK, Kim JH, Chae SC, Kim YJ, et al. Obesity paradox in Korean patients undergoing primary percutaneous coronary intervention in ST-segment elevation myocardial infarction. *J Cardiol*. 2010;55(1):84-91.
 33. Das SR, Alexander KP, Chen AY, Powell-Wiley TM, Diercks DB, Peterson ED, et al. Impact of body weight and extreme obesity on the presentation, treatment, and in-hospital outcomes of 50 149 patients with ST-Segment elevation myocardial infarction results from the NCDR (National Cardiovascular Data Registry). *J Am Coll Cardiol*. 2011;58(25):2642-2650.
 34. Tan XF, Shi JX, Chen AMH. Prolonged and intensive medication use are associated with the obesity paradox after percutaneous coronary intervention: A systematic review and meta-analysis of 12 studies. *BMC Cardiovasc Disord*. 2016;16:125.
 35. Akin I, Nienaber CA. «Obesity paradox» in coronary artery disease. *World J Cardiol*. 2015;7(10):603-608.
 36. Zuchinali P, Souza GC, Alves FD, d'Almeida KSM, Goldraich LA, Clausell NO, et al. Triceps skinfold as a prognostic predictor in outpatient heart failure. *Arq Bras Cardiol*. 2013;101(5):434-441.
 37. Clark AL, Fonarow GC, Horwich TB. Waist circumference, body mass index, and survival in systolic heart failure: the obesity paradox revisited. *J Card Fail*. mayo de 2011;17(5):374-380.
 38. Clark AL, Chyu J, Horwich TB. The obesity paradox in men versus women with systolic heart failure. *Am J Cardiol*. 2012;110(1):77-82.
 39. Littnerova S, Parenica J, Spinar J, Vitovec J, Linhart A, Widimsky P, et al. Positive influence of being overweight/obese on long-term survival in patients hospitalised due to acute heart failure. *PLoS One*. 2015;10(2):e0117142.
 40. Zamora E, Lupón J, Enjuanes C, Pascual-Figal D, de Antonio M, Domingo M, et al. No benefit from the obesity paradox for diabetic patients with heart failure. *Eur J Heart Fail*. 2016;18(7):851-858.
 41. Curtis JP, Selter JG, Wang Y, Rathore SS, Jovin IS, Jadbabaie F, et al. The obesity paradox: Body mass index and outcomes in patients with heart failure. *Arch Intern Med*. 2005;165(1):55-61.
 42. Vest AR, Wu Y, Hachamovitch R, Young JB, Cho L. The Heart Failure Overweight/Obesity Survival Paradox: The Missing Sex Link. *JACC Heart Fail*. 2015;3(11):917-926.
 43. Lin GM, Li YH, Yin WH, Wu YW, Chu PH, Wu CC, et al. The Obesity-Mortality Paradox in Patients With Heart Failure in Taiwan and a Collaborative Meta-Analysis for East Asian Patients. *Am J Cardiol*. 2016;118(7):1011-1018.
 44. Zafir B, Salman N, Crespo-Leiro MG, Anker SD, Coats AJ, Ferrari R, et al. Body surface area as a prognostic marker in chronic heart failure patients: Results from the Heart Failure Registry of the Heart Failure Association of the European Society of Cardiology. *Eur J Heart Fail*. 2016;18(7):859-688.
 45. Hu G, Jousilahti P, Antikainen R, Katzmarzyk PT, Tuomilehto J. Joint effects of physical activity, body mass index, waist circumference, and waist-to-hip ratio on the risk of heart failure. *Circulation*. 2010;121(2):237-244.
 46. Khalid U, Ather S, Bavishi C, Chan W, Loehr LR, Wruck LM, et al. Pre-morbid body mass index and mortality after incident heart failure: the ARIC Study. *J Am Coll Cardiol*. 2014;64(25):2743-2749.
 47. Puig T, Ferrero-Gregori A, Roig E, Vazquez R, Gonzalez-Juanatey JR, Pascual-Figal D, et al. Prognostic value of body mass index and waist circumference in patients with chronic heart failure (Spanish REDINSCOR Registry). *Rev Esp Cardiol (Engl Ed)*. 2014;67(2):101-106.
 48. Lee SH, Park JS, Kim W, Shin DG, Kim YJ, Kim DS, et al. Impact of body mass index and waist-to-hip ratio on clinical outcomes in patients with ST-segment elevation acute myocardial infarction (from the Korean

- Acute Myocardial Infarction Registry). *Am J Cardiol.* 2008;102(8):957-965.
49. Mehra MR, Uber PA, Park MH, Scott RL, Ventura HO, Harris BC, et al. Obesity and suppressed B-type natriuretic peptide levels in heart failure. *J Am Coll Cardiol.* 2004;43(9):1590-1595.
 50. Gastelurrutia P, Lupón J, de Antonio M, Zamora E, Domingo M, Urrutia A, et al. Body mass index, body fat, and nutritional status of patients with heart failure: The PLICA study. *Clin Nutr.* 2015;34(6):1233-1238.
 51. Aquilani R, La Rovere MT, Febo O, Boschi F, Iadarola P, Corbellini D, et al. Preserved muscle protein metabolism in obese patients with chronic heart failure. *Int J Cardiol.* 2012;160(2):102-8.
 52. Sharma A, Lavie CJ, Borer JS, Vallakati A, Goel S, Lopez-Jimenez F, et al. Meta-analysis of the relation of body mass index to all-cause and cardiovascular mortality and hospitalization in patients with chronic heart failure. *Am J Cardiol.* 2015;115(10):1428-1434.
 53. Anaszewicz M, Budzyński J. Clinical significance of nutritional status in patients with atrial fibrillation: An overview of current evidence. *J Cardiol.* 2017;69(5):719-730.
 54. Tsang TSM, Barnes ME, Miyasaka Y, Cha SS, Bailey KR, Verzosa GC, et al. Obesity as a risk factor for the progression of paroxysmal to permanent atrial fibrillation: A longitudinal cohort study of 21 years. *Eur Heart J.* 2008;29(18):2227-2233.
 55. Guglin M, Maradia K, Chen R, Curtis AB. Relation of obesity to recurrence rate and burden of atrial fibrillation. *Am J Cardiol.* 2011;107(4):579-582.
 56. Wang J, Yang Y Min, Zhu J, Zhang H, Shao X hui, Tian L, et al. Overweight is associated with improved survival and outcomes in patients with atrial fibrillation. *Clin Res Cardiol.* 2014;103(7):533-452.
 57. Inoue H, Kodani E, Atarashi H, Okumura K, Yamashita T, Origasa H, et al. Impact of Body Mass Index on the Prognosis of Japanese Patients With Non-Valvular Atrial Fibrillation. *Am J Cardiol.* 2016;118(2):215-221.
 58. Sandhu RK, Ezekowitz J, Andersson U, Alexander JH, Granger CB, Halvorsen S, et al. The «obesity paradox» in atrial fibrillation: observations from the ARISTOTLE (Apixaban for Reduction in Stroke and Other Thromboembolic Events in Atrial Fibrillation) trial. *Eur Heart J.* 2016;37(38):2869-2878.
 59. Wang J, Yang Y Min, Zhu J, Zhang H, Shao X Hui. Obesity paradox in patients with atrial fibrillation and heart failure. *Int J Cardiol.* 2014;176(3):1356-1358.
 60. Badheka AO, Rathod A, Kizilbash MA, Garg N, Mohamad T, Afonso L, et al. Influence of obesity on outcomes in atrial fibrillation: Yet another obesity paradox. *Am J Med.* 2010;123(7):646-651.
 61. González-Cambeiro MC, Abu-Assi E, Raposeiras-Roubín S, Rodríguez-Mañero M, Otero-Raviña F, R González-Juanatey J, et al. Exploring The Obesity Paradox In Atrial Fibrillation. AFBAR (Atrial Fibrillation Barbanza Area) Registry Results. *J Atr Fibrillation.* 2014;6(5):991.
 62. Pensak ML, Choo DI, Ahmed ZM, Beaudoin KS, Bojrab DI, Brainard L, et al. Adult Audiological Rehabilitation. In: *Clinical Otology.* 4th edition. New York: Thieme Verlag; 2015.p.392-401
 63. Berkovitch A, Kivity S, Klempfner R, Segev S, Milwidsky A, Erez A, et al. Body mass index and the risk of new-onset atrial fibrillation in middle-aged adults. *Am Heart J.* 2016;173:41-48.
 64. Pathak RK, Middeldorp ME, Meredith M, Mehta AB, Mahajan R, Wong CX, et al. Long-Term Effect of Goal-Directed Weight Management in an Atrial Fibrillation Cohort: A Long-Term Follow-Up Study (LEGACY). *J Am Coll Cardiol.* 2015;65(20):2159-2169.
 65. Blundell JE, Dulloo AG, Salvador J, Frühbeck G, EASO SAB Working Group on BMI. Beyond BMI--phenotyping the obesities. *Obes Facts.* 2014;7(5):322-832.
 66. Capers PL, Kinsey AW, Miskell EL, Affuso O. Visual Representation of Body Shape in African-American and European American Women: Clinical Considerations. *Clin Med Insights Womens Health.* 2016;9(Suppl 1):63-70
 67. Naukkarinen J, Heinonen S, Hakkarainen A, Lundbom J, Vuolteenaho K, Saarinen L, et al. Characterising metabolically healthy obesity in weight-discordant monozygotic twins. *Diabetologia.* 2014;57(1):167-176.
 68. Primeau V, Coderre L, Karelis AD, Brochu M, Lavoie ME, Messier V, et al. Characterizing the profile of obese patients who are metabolically healthy. *Int J Obes (Lond).* 2011;35(7):971-981.
 69. van Vliet-Ostaptchouk JV, Nuotio ML, Slagter SN, Doiron D, Fischer K, Foco L, et al. The prevalence of metabolic syndrome and metabolically healthy obesity in Europe: a collaborative analysis of ten large cohort studies. *BMC Endocr Disord.* 2014;14:9.
 70. Appleton SL, Seaborn CJ, Visvanathan R, Hill CL, Gill TK, Taylor AW, et al. Diabetes and cardiovascular disease outcomes in the metabolically healthy obese phenotype: A cohort study. *Diabetes Care.* 2013;36(8):2388-2394.
 71. Aung K, Lorenzo C, Hinojosa MA, Haffner SM. Risk of developing diabetes and cardiovascular disease in metabolically unhealthy normal-weight and metabolically healthy obese individuals. *J Clin Endocrinol Metab.* 2014;99(2):462-468.

72. Chang Y, Ryu S, Choi Y, Zhang Y, Cho J, Kwon MJ, et al. Metabolically Healthy Obesity and Development of Chronic Kidney Disease: A Cohort Study. *Ann Intern Med.* de 2016;164(5):305-312.
73. Gómez-Ambrosi J, Catalán V, Rodríguez A, Andrada P, Ramírez B, Ibáñez P, et al. Increased cardiometabolic risk factors and inflammation in adipose tissue in obese subjects classified as metabolically healthy. *Diabetes Care.* 2014;37(10):2813-2821.
74. Fan J, Song Y, Chen Y, Hui R, Zhang W. Combined effect of obesity and cardio-metabolic abnormality on the risk of cardiovascular disease: A meta-analysis of prospective cohort studies. *Int J Cardiol.* 2013;168(5):4761-4768.
75. Schröder H, Ramos R, Baena-Díez JM, Mendez MA, Canal DJ, Fito M, et al. Determinants of the transition from a cardiometabolic normal to abnormal overweight/obese phenotype in a Spanish population. *Eur J Nutr.* 2014;53(6):1345-53.
76. Romero-Corral A, Somers VK, Sierra-Johnson J, Korenfeld Y, Boarin S, Korinek J, et al. Normal weight obesity: A risk factor for cardiometabolic dysregulation and cardiovascular mortality. *Eur Heart J.* 2010;31(6):737-746.
77. Hyun YJ, Koh SJ, Chae JS, Kim JY, Kim OY, Lim HH, et al. Atherogenicity of LDL and unfavorable adipokine profile in metabolically obese, normal-weight woman. *Obesity (Silver Spring).* 2008;16(4):784-789.
78. Suliga E, Kozieł D, Głuszek S. Prevalence of metabolic syndrome in normal weight individuals. *Ann Agric Environ Med.* 2016;23(4):631-635.
79. De Lorenzo A, Martinoli R, Vaia F, Di Renzo L. Normal weight obese (NWO) women: An evaluation of a candidate new syndrome. *Nutr Metab Cardiovasc Dis.* 2006;16(8):513-523.
80. De Lorenzo A, Del Gobbo V, Premrov MG, Bigioni M, Galvano F, Di Renzo L. Normal-weight obese syndrome: early inflammation? *Am J Clin Nutr.* 2007;85(1):40-45.
81. Lim S, Kim JH, Yoon JW, Kang SM, Choi SH, Park YJ, et al. Sarcopenic obesity: Prevalence and association with metabolic syndrome in the Korean Longitudinal Study on Health and Aging (KLoSHA). *Diabetes Care.* 2010;33(7):1652-1654.
82. Kim TN, Choi KM. The implications of sarcopenia and sarcopenic obesity on cardiometabolic disease. *J Cell Biochem.* 2015;116(7):1171-1178.
83. Tian S, Xu Y. Association of sarcopenic obesity with the risk of all-cause mortality: A meta-analysis of prospective cohort studies. *Geriatr Gerontol Int.* 2016;16(2):155-166.

Emotions, anxiety, depression and the immune system: an integrative view of psychoneuroimmunology from a meta-analytic review of the narrative

Emociones, ansiedad, depresión y sistema inmunológico: una visión integradora de la psiconeuroinmunología desde una revisión meta-analítica de la narrativa

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SUMMARY

The study focused on conducting a meta-analytic review of three variables psychoneuroimmunology, emotions, and the immune system, intending to find a relationship between them. The methodology was the PRISMA statement with inclusion criteria: production of the last five years, full text, exclusion criteria: book chapters, reviews, editorials, letters to the editorials, as well as systematic and meta-analytic reviews; a

formula was created from the variables with Boolean operators (AND, OR, NOT) in databases: Web of Science, PubMed and Elsevier. The first sweep denotes (n=2237) articles and after the application of the screening, the final sample was (n=26). Among the findings is the emergence of three categories of analysis using a word map: cognitive abilities, mental fatigue, and stressors. In conclusion, psychoneuroimmunology is a science that articulates mental processes and the functioning of the nervous, immune, and endocrine systems that affect the individual in such a way that the psychological aspects linked to emotional management and control can present better management and intervention in mental illnesses.

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Keywords: *Anxiety, depression, emotions, immune system, psychoneuroimmunology.*

RESUMEN

El estudio se centró en la realización de una revisión meta-analítica de tres variables psiconeuroinmunología, emociones, y el sistema inmunológico, con la intención de encontrar una relación entre ellos. La metodología fue la declaración PRISMA con criterios de inclusión: producción investigativa de los últimos cinco años con texto completo; y criterios de exclusión: capítulos de libros, reseñas, editoriales, cartas a los editoriales, así como revisiones sistemáticas y meta-revisiones analíticas; se creó una fórmula a partir de las variables con operadores booleanos (AND, OR, NOT) en bases de datos: Web of Science, PubMed y Elsevier. El primer barrido arrojó (n=2237) artículos y después de la aplicación del cribado, la muestra final fue (n=26). Entre los hallazgos se encuentra la aparición de tres categorías de análisis utilizando un mapa de palabras: capacidades cognitivas, fatiga mental y factores estresantes. En conclusión, la psiconeuroinmunología es una ciencia que articula los procesos mentales y el funcionamiento de los sistemas inmunológicos y endocrinos son afectados por los aspectos psicológicos relacionados con el manejo y control emocional, siendo necesario un mejor manejo e intervención de estos en las enfermedades mentales.

Palabras clave: *Ansiedad, depresión, emociones, sistema inmunológico, psiconeuroinmunología-*

INTRODUCTION

Positive and negative emotions have generated in individuals diverse experimentations that have allowed linking the mind-body duality by analyzing the attitudes and mental habits that are associated with studies linked to psychoneuroimmunology (1), which has been described as the science that investigates the association between the psyche and the immune systems; identifying that there is a strong influence of the emotional management and control that individuals have on the functioning of the pituitary gland; thus implying that when experiencing an emotion this performs a transformation process that is related to a physical activity, which has an impact on the

body, a situation that is explained through the reception of emotional inputs that trigger organic reactions. Psychoneuroimmunology is one of the areas of clinical intervention that approaches health problems and their link with the emotional states that affect the health of human beings (2).

To achieve an intervention from psychoneuroimmunology and health states in individuals, it is necessary to analyze the interconnections between organic components (biological), psychological (emotional), and environmental (contexts) (3) that are linked to the basis of the elements associated with the states of stress, anxiety, and depression. Because psychotherapists holistically focus their intervention on the dysfunctions that concatenate to trigger organic symptoms that manifest in behavioral patterns (4). In this way, the neuroendocrine system presents neurochemical failures characterized by altered responses in depressive and anxiogenic manifestations, which alter the functioning of neurotransmitters generating clinical indicators, affecting the adrenal autonomic system and with it its incidence in mood affectations; creating collateral effects that influence glutamatergic neurotransmission that requires pharmacological and psychological interventions to inhibit the effects linked to the central nervous system (5).

The relationship between the immune, endocrine, and central nervous system is articulated from the functioning and regulation between hormones and neurotransmitters, generating an autonomous defence system in the organism that has an association of reciprocal modulation between immunocytes, the reticuloendothelial and hematopoietic systems that influence the regulation of hormone production levels and on the psychological variables that present experimental evidence associated to the behavioral patterns that explain the health-disease dyad in individuals (6), identifying the dysfunctions associated to the pathologies that are presented from the emotional substrate, which influences from the theological postulate and the receptor functions coming from the stimuli that affect the corporal systems from the position of the biological base, explainable from the methods of neuropathology in relation to the holistic position of the mind and the body (7).

For its part, mental health from the positive dimension has been defined as a complete state of well-being that includes physical, mental, and social aspects (8). Understanding in this way that when speaking from the integrity of the sphere of health, it is necessary to mention the emotional component, because the brain within its functions generates substances that stimulate neurotransmitters that are connected to the immune system, thus generating defences in the body and activating changes from the immune system (9). So from the neuroimmune factors it has been established that the connection between emotional factors and perceived vulnerability significantly increases the risks of suffering from major diseases because it generates more symptoms and increases the presence of negative emotions due to dissatisfaction that is linked to the factors of psychological discomfort and inhibitory personality patterns (10).

Therefore, the relationship between mind and body is adjusted to the emotional processes and how thoughts originated, linking these components to the levels of satisfaction with life, an increase of psychological well-being, and thus an increase of health determinants that are fundamental in human beings (11); because the responses that are generated from the immune system, represent physical and emotional psychic aspects that are adjusted to the aspects that determine the social and cultural components that allow the increase of the states of satisfaction with oneself and that lead to increase directly the states of health, due to the subjective expressions and self-representation that affect the manifestation of symptoms that are assumed by the individual from an experimental perspective (12).

The biopsychosocial processes of the individual are linked to cognitive factors and the existing relationships between the central nervous system, endocrinology, and immunology (13), because the information that comes from the environmental determinants fulfil a regulation function between the events and how they are perceived, determining in this way that the greater the increase of positive emotions such as joy, optimism, love, the greater the increase of health determinants presented by the subject; thus suggesting that the specific aspects related to emotional regulation and biological immunity

are presented satisfactorily if there is a positive correlation with psychic states, providing explanatory support for the relationship between pathogenic factors and the link with attitudes, thoughts and personality traits (14).

Finally, psychoneuroimmunology is fundamental to achieving an understanding of the psychological factors related to diseases of the body, the proper management of emotions will allow you to improve and contribute to patient treatments, establishing the articulations that exist between behavior and the constitution of some diseases in the body (15). Determining the significant increases in states of well-being that are associated with increases in health determinants that lead individuals to develop relational aspects with self-care processes in favor of mental health status and the increase of positive emotions as a defence strategy from the functioning of the autoimmune system (16).

METHOD (PRISMA)

The prism statement performs documentation employing a systematic review of the literature, employing which first identification of the scientific advances in the subject is made, to be subsequently selected according to the inclusion criteria to evaluate and synthesize the corresponding studies that provide a state of knowledge from the approach of a research question that seeks to study a particular phenomenon (17).

Thus, the analysis of observational documentation evaluates the evidence from a quantitative synthesis of the results obtained from an iterative process that analyzes the retrospective contributions, synthesizing the findings in an organized manner, where the biases of systematic reviews are reduced (18).

Inclusion criteria

Among the aspects taken into account for the processing of the information, intellectual production published in the last five years was identified, in studies under full text, which had

as a characteristic a variable associated with the subject of analysis, in the English language, with adult participants (19).

Exclusion criteria

We excluded texts related to book chapters, reviews, editorials, letters to publishers, as well as systematic and meta-analytic reviews, documents in languages other than English, and findings outside the range of the last five years and whose samples were not representative (20).

Search strategies

The search was conducted in specialized databases, which were selected according to the thematic relevance in the areas of health, in line with the reports of advances that incorporate interventional treatments in the area of psychoneuroimmunology and its relationship with emotions in individuals from the psychopathological perspective of diseases such as depression and anxiety as shown in Table 1.

Emotion AND psychoneuroimmunology OR anxiety NOT symptoms; Emotion AND psychoneuroimmunology OR depression NOT

dysfunctions; Positive health AND system OR immune NOT stress; Immune system AND neuroendocrine OR cortisol NOT suppression; Health AND disease OR neurogenesis NOT abilities; Emotional AND pathogens OR glucocorticoids NOT effects; Immune system AND emotional OR hypothalamus NOT mechanisms; Emotional AND treatments OR depression AND anxiety OR affective states NOT manifestations.

Data collection process

The analysis of the documents was based on the PRISMA system that takes into account the inclusion of information through evidence, reviewing the relevant findings on the subject that included the analysis of the variables taking into account the contributions made by the scientific community, taking into account that advances in mental health are focused from the perspective of psychoneuroimmunology because the trend in intervention indicates that patients with pathologies or dysfunctions have a high probability of rehabilitation. After all, the different states of mind present direct repercussions on the health status of individuals (Table 1).

Search equations

Table 1. Information search criteria

Databases	Equations in data bases
Web of Science	Emotion AND psychoneuroimmunology OR anxiety NOT symptoms; Emotional AND treatments OR depression AND anxiety OR affective states NOT manifestations. Emotion AND psychoneuroimmunology OR depression NOT dysfunctions.
PubMed	Immune system AND emotional OR hypothalamus NOT mechanisms; Positive health AND system OR immune NOT stress; Emotional AND pathogens OR glucocorticoids NOT effects.
Elsevier	Immune system AND neuroendocrine OR cortisol NOT suppression; Emotional AND treatments OR depression AND anxiety OR affective states NOT manifestations. Emotion AND psychoneuroimmunology OR anxiety NOT symptoms

Own elaboration (2023)

EMOTIONS, ANXIETY, DEPRESSION AND THE IMMUNE SYSTEM

Table 2. Cross-referencing of search terms in the databases.

Crosses/ databases	Web of Science	PubMed	Elsevier	Total
Emotion AND psychoneuroimmunology OR anxiety NOT symptom, Immune system AND emotional OR hypothalamus NOT mechanisms	321	125	157	603
Emotional AND treatments OR depression AND anxiety OR affective states NOT manifestation; Positive health AND system OR immune NOT stress	432	256	243	931
Emotion AND psychoneuroimmunology OR depression NOT dysfunctions; Emotional AND pathogens OR glucocorticoids NOT effects	467	147	89	703
Total	1 220	528	489	2 237

Own elaboration (2023)

Table 3. Process of identification, elimination, and selection of articles.

Equation	Databases	No filtering	No access	Revisions/ Incomplete/ Duplicates	Not met Criteria	Selection
Emotion AND psychoneuroimmunology OR anxiety NOT symptom, Immune system AND emotional OR hypothalamus NOT mechanisms	Web of Science PubMed Elsevier	1 220	545	512	154	9
Emotional AND treatments OR depression AND anxiety OR affective states NOT manifestation; Positive health AND system OR immune NOT stress	Web of Science PubMed Elsevier	528	348	180	169	11
Emotion AND psychoneuroimmunology OR depression NOT dysfunctions; Emotional AND pathogens OR glucocorticoids NOT effects	Web of Science PubMed Elsevier	489	284	205	199	6
Total		2 237	1 177	897	522	26

Own elaboration (2023)

Selection of the studies

The selected studies were based on the analysis of the variables that imply dual pathologies in the processes of mental health affectation in the area of psychoneuroimmunology. The main articles were reviewed from the databases, applying Boolean equations, and then the information was classified by eliminating duplicate files (18) (Table 2).

The selection of the articles was carried out taking into account the observation window of the last five years, taking into account the compliance of the variables studied, subsequently, the studies that were duplicated or did not meet the criteria were eliminated, additionally, the publications that were available in the full text were taken into account, eliminating the abstracts and research notes (19) (Table 3).

Data extraction

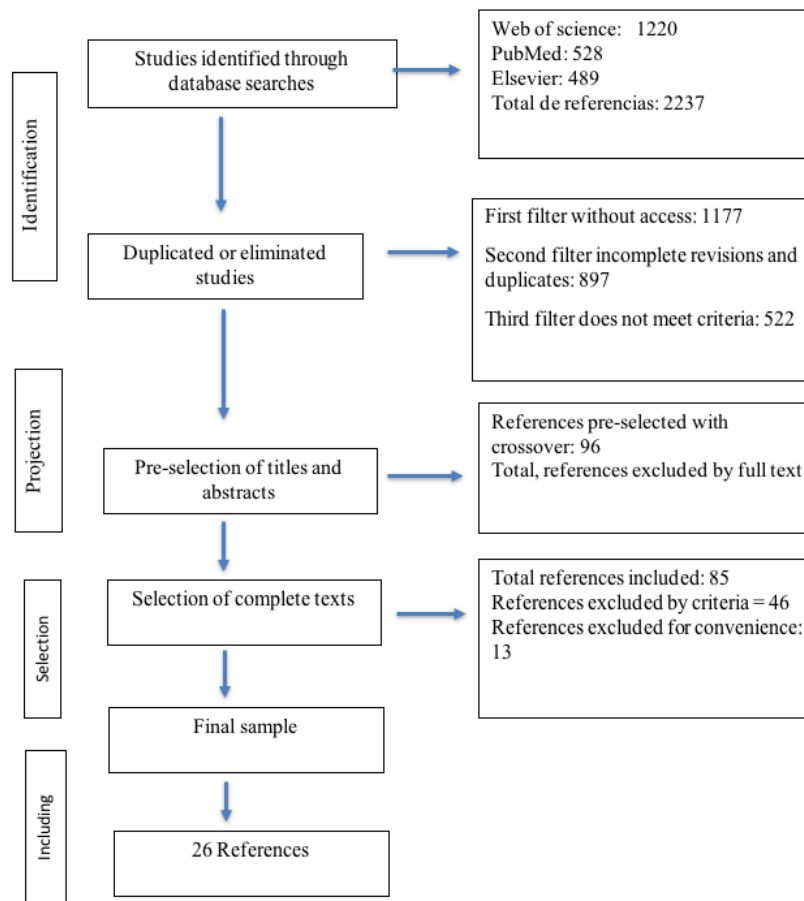


Figure 1. Flowchart of the process of study selection.

Word map

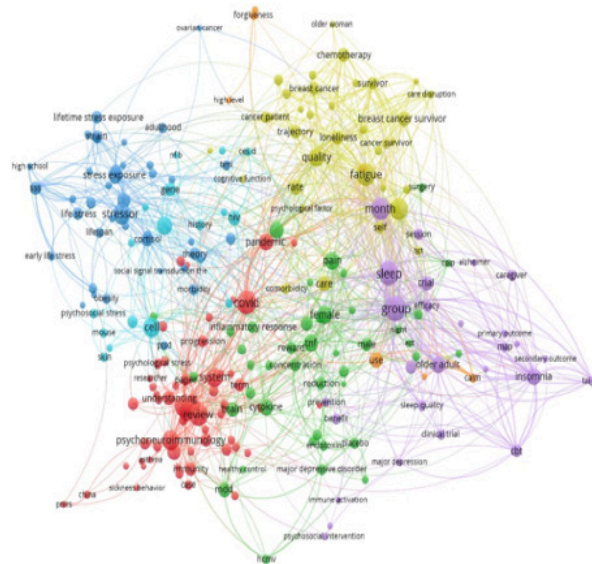


Figure 2. VOSviewer Word Networ.

According to what is expressed in the figure and in relation to the study variables, three categories of analysis are denoted as follows:

Cognitive functions or skills

They are defined as the mental processes that allow the individual to receive, process, and elaborate information, taking an active role in the sensory perception of the surrounding environment (21). These allow learning, storage, and comprehension processes to be carried out in the integration of information processing, thus playing an important role in decision-making and dual execution. Determining that the link between emotions and thinking generates positive behaviors that allow the control of mental states related to the psychological response that is linked to information processing and the formation of thought (22).

This indicates that behavioral determinants are linked to the experience of situations and experiences that are related to feelings (23). Thus, the link between behavior and the brain

is presented in an interdependent manner but correlated through the development of socio-emotional skills that integrate the regularization and evaluation of thought from the articulation with positive or negative emotions that lead to the experience of well-being, the strengthening of social skills and healthy relationships that influence health components (24).

Mental fatigue

Fatigue is a state that presents a lack of energy and motivation, as well as symptoms related to drowsiness, apathy, boredom, and emotional stressors, this emotional fatigue leads to the experience linked to the appearance of headaches, muscle tension, and breathing difficulties, among others (25). Within this there is an alteration that affects the decrease in mental functioning, which leads to emotional states presented negatively hindering concentration, skill development, and attentional processes that directly affect feelings

and emotions, increasing the risks of the onset of heart disease and chronic diseases that have a negative impact on mental health (26).

One of the problems that have a greater impact on mental health is the appearance of depressive and anxious conditions that trigger other comorbid pathologies, among which fibromyalgia and cancer stand out, due to the threats and the experience of organic reactions that have a direct impact on internal and external factors that cause psychological disorders and alterations in the central nervous system, due to immunological reactions caused by stress (27); the presence of acute and chronic diseases and immunoregulation disorders and the appearance of neuropsychiatric markers that interfere in the ability to develop activities of daily living that present physical, mental and emotional chronicity due to the difficulty they present in finding a balance in the linking of states of well-being (28).

Stressors

Stress is an emotional response generated by the perception of threats and the security of individuals that are identified in the alteration of neuronal and endocrine functions that impede the psychological adjustment in the human being (29). In this way, the interactions that occur between the nervous system and the immune system present alterations in the adrenergic neurotransmitters obstructing the neuropeptides that prevent a regulation between the central nervous system and the immune system that is linked to the immunosuppression behavior product of the psychophysiological changes that occur in the brain in the face of threatening responses (30).

For the above-mentioned (31), the pituitary ovens present pathophysiological alterations through the chromaffin cells and the activation of the adrenal medulla that generate in the individual an autoimmune response linked to the growth, maturation, and functioning of the immune system (32). Thus, the activating and inhibitory effects of adrenocorticotrophic hormones release corticotropin that acts on activated lymphocytes and glucocorticoid receptors that prepare the individual to generate neuromodulation in the synaptic interconnection that transforms the information from the amygdala to the brain through a bidirectional communication that

generates a response to psychological stress and stressful experiences that alter the immune parameters in individuals (33).

RESULTS

The results are presented in Table 4.

DISCUSSION

Psychoneuroimmunology focuses its interventions on the psychic and physical interaction processes that occur in the central nervous, endocrine and immune systems (34), thus generating an integrative vision of the processes of health and disease that occur in the individual from the appearance, course and development of somatic diseases that are linked to the psychological alterations that occur more frequently such as anxiety, depression and stress that involve negative manifestations associated with the extrapolation of the psychological alterations that occur more frequently such as anxiety, depression and stress, course and development of somatic diseases that are linked to the psychological alterations that occur more frequently such as anxiety, depression and stress that involve negative manifestations associated with the extrapolation of feelings and emotions that integrate an approach to health problems that are interrelated in the proper functioning of emotions and their impact on the body (35). Consequently, the relevant manager will help to improve the different interventions that the patient has had in their treatments, and their direct incidence in the forms of behavior that lead to the appearance of symptomatology associated with organic diseases (36).

For its part (37), depression has a direct impact on the immune system causing a decrease in serotonin and noradrenaline levels that cause immune reactions linked to dysfunctions and disorders that produce negative emotions related to frustration, anger, fear, and sadness (38). This affects the organism in the appearance of dual pathologies such as stress, fibromyalgia, and cancer since the deterioration of the patient leads to psychological alterations that make

Table 4.

Doi	Title	Year of publication	Sample	Treatment	Country/ City	Mean age	Gender %	(Follow-up time)
1 https://doi.org/10.1177/09727531221109117	Psychoneuroimmunology of Meditation	2022		Therapeutic Role of Yoga and Meditation Preksha (MP)	New Delhi/ India	25 years	N/A	Meditation may have positive benefits in regulating cognitive and emotional behavior
2 doi:10.1080/10253890.2021.1876658	Oxytocin, cortisol, and cognitive control during acute and naturalistic stress	2021	37 participants	Experimental session of acute stress through videos	California/ USA	22 Years	37 women	Oxytocin may provide women with an anxiolytic and affective effect that favors social synchrony and makes it easier to overcome stressful moments
3 https://doi.org/10.1161/ahajpaha.120.069406	Do psychiatric patients experience more psychiatric symptoms during COVID-19 pandemic and lockdown? A case-control study with service and research implications for immunopsychiatry	2020	76 patients healthy people	Impact of Event Scale-Revised (IES-R)	Chongqing /China	18 years		Study confirms the severity of the negative psychological impact on psychiatric patients during the COVID-19 epidemic
4 https://doi.org/10.1016/j.jad.2021.09.004	A mindfulness meditation mobile app improves depression and anxiety in adults with sleep disturbance: Analysis from a randomized controlled trial	2021	239 participants	Insomnia Severity Index (ISI)	Arizona/ USA	Average age 44.5 years	74.6 % women 40.6 % of the racial-ethnic population diverse	A meditation app can improve depression and anxiety in adults with sleep disorders.

Continued in page S453...

...continuation Table 4 from page S452

Doi	Title	Year of publication	Sample	Treatment	Country/ City	Mean age	Gender %	(Follow-up time)
5 https://doi.org/10.1038/s41598-020-62652-1	Mindfulness Meditation Activates Altruism	2020	326 participants	Calm app (meditation)	Connecticut/ USA	25 years	58,28% women	The current findings are the first to identify a relationship between mindfulness meditation and cooperation
6 doi:10.1080/13607863.2021.1876636	Early-life stress, depressive symptoms, and inflammation: the role of social factors	2022	3416 participants	Meditation through mindfulness	Los Angeles/ USA	From 36 years to 97.		The frequency of social contact and social support can moderate depressive symptoms.
7 doi:10.1016/j.jbbi.2019.03.004	Depressive Symptoms and Immune Transcriptional Profiles in Late Adolescents	2019	87 participants	Psychosocial questionnaire Depression Scale of the Center for epidemiological Studies	Los Angeles/ USA	18 years		Teens with levels of Depressive symptoms may be at increased risk of developing immune-related somatic diseases in adulthood.
8 https://doi.org/10.1093/abm/kaab106	Psychological Predictors of Self-reported COVID-19 Outcomes: Results From a Prospective Cohort Study	2022	1087 participants	Psychological factors survey Patient Health Questionnaire (PHQ-9) Generalized Anxiety Disorder Scale Perceived Stress	United Kingdom	18 years onwards		COVID-19 infection and symptoms can increase among people with distress elevated psychological.

Continued in page S454...

Doi	Title	Year of publication	Sample	Treatment	Country/City	Mean age	Gender %	(Follow-up time)
9	Neuroinflammation as a pathophysiological factor in the development and maintenance of functional seizures: A hypothesis	2021	12 participants	Scale The scale of Positive and Negative Experiences Hospital Anxiety and Depression Scale (HADS). Profile of Mood States	Alabama / USA	23y 50 Years	12 women	This study revealed that the data provided is not sufficient to corroborate the hypothesis. However, psychiatric and immune functioning has given rise to a new field of study called psychoneuroimmunology.
10	More than a skin disease: stress, depression, anxiety levels, and serum neurotrophins in lichen simplex chronic,	2021	36 participants	Hospital Anxiety Scale Depression Scale Perceived Stress Scale	Istanbul, Turkey	Average age 37 years	7 men 29 women	Patients with Lichen Simplex Chronicus (LSC) are at risk of increased levels of stress, anxiety, depression, impaired quality of life, and decreased levels of neurotrophins
11	Psychosocial Resilience to Inflammation - Associated Depression: A Prospective Study of Breast-Cancer Survivors	2022	270 participants	Center for epidemiologic Studies - Depression (CES-D) blood samples for C-reactive	California / USA		270 Women	The importance of psychosocial resilience by demonstrating a relationship between psychosocial resources and sensitivity to depressive symptoms associated with inflammation.

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Doi	Title	Year of publication	Sample	Treatment	Country / City	Mean age	Gender %	(Follow-up time)
				protein (CRP) evaluation Event Impact Scale Attachment subscale of the Social Dispositions Scale Revised Life Orientation Test (LOT-R) Pearlin - Schooler Mastery Scale Rosenberg self-esteem scale Positive and Negative Affect Schedule Subscale Mindfulness Awareness Scale				
12	Age, BMI, and inflammation: Associations with emotion recognition	2021	90 participants	test screen	Birmingham England	21 to 35 years / 63 and 80 years	60% women	Young people with a high BMI performed worse on the RMET compared with their normal BMI counterparts, while the opposite pattern was observed in older individuals.

Continued in page S456...

Doi	Title	Year of publication	Sample	Treatment	Country/ City	Mean age	Gender %	(Follow-up time)
13 https://doi.org/10.1186/s13063-020-04242-0	Goal-Focused Emotion-Regulation Therapy (GET) for young adult survivors of testicular cancer: a pilot randomized controlled trial of a behavioral intervention protocol	2020	60 participants	Goal-Focused Emotion Regulation Therapy (GET)	California/ US	18 and 39 years	Men	GET may have the potential to improve overall adjustment to cancer
14 http://doi.org/10.2147/JIR.S285000	Association Between Systemic Immune-Inflammation Index and Diabetic Depression	2021	2 556 participants	Depression was assessed using the PHQ-9.26 Blood samples	Yanji, China	Average age 61.4 years	1 252 women 1 314 men	Systemic inflammation is a risk factor for depression in patients with diabetes mellitus.
15 https://doi.org/10.3389/fimmu.2020.585294	CD157 and Brain Immune System in (Patho)physiological Conditions: Focus on Brain Plasticity	2020	Mice	CD157 on neuronal and glial cells	Krasnoyarsk, Russia K			CD157 could play a role in the regulation of anxiety and social avoidance
16 https://doi.org/10.2147/JIR.S387588	Evaluation of Inflammatory Response System (IRS) and Compensatory Immune Response	2022	100 participants	Children's Depression Inventory (CDI) Blood test	Zilina, Slovakia	Average age 15.4 years	40 men 60 women	Importantly, the association between the inflammatory response system (IRS) and the compensatory immune response system (CIRS) in adolescent depression appears to be gender-specific.

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	Doi	Title	Year of publication	Sample	Treatment	Country / City	Mean age	Gender %	(Follow-up time)
		(CIRS) in Adolescent Major Depression							-specific.
17	https://doi.org/10.1038/s41577-021-00508-z	Neuromodulation by the immune system: a focus on cytokines	2021	mice	Cytokine immune molecules	Virginia/ USA			Cytokines can be used to send signals to neurons and thus regulate neuronal activity
18	https://doi.org/10.1186/s13041-022-00902-1	Tumor suppression and improvement in immune systems by specific activation of dopamine D1receptor-expressing neurons in the nucleus accumbens	2022	mice	Stimulation a repeat of neurons with D1 receptors	Tokyo, Japan			Stimulation of neurons with D1 receptors in the region of the nucleus accumbens suppressed the tumor progression and improved the immune system. It may be a valuable and useful approach to cancer therapy.
19	https://doi.org/10.3390/s22103834	"Listen to Your Immune System When It's Calling for You": Monitoring Autoimmune Diseases Using the iShU App	2022	15 participants	iShU App	Aveiro, Portugal	From the age of 23 to the age of 59.	9 women 6 men	The prototype allows the monitoring of autoimmune diseases before, during and after inflammatory crises, thus responding to personal needs.
20	https://doi.org/10.1371/journal.pone.0272922	Promoting positive emotions and instilling concern for the needs of others during the COVID-19	2021	237 participants	Hero Program	Buenos Aires, Argentina	12 to 15 years		The Hero program was a useful online application to enhance positive emotions and promote prosocial behavior in uncertain times.

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	Doi	Title	Year of publication	Sample	Treatment	Country/ City	Mean age	Gender %	(Follow-up time)
21	10.2478/mec-2021-0001	Emotions in music and their impact on the emotions of percipients: research on human voice and singing	2021	56 participants	POMS Questionnaire BRUMS Mood Questionnaire	Prešov, Slovakia	From 18 years to 44.	18 34 women 22 men	The sound, the voice, and the singing are relaxing, stabilize the physical and mental state and emotional condition, allowing to reach a condition of deep concentration.
22	10.3389/finbeh.2022.869526	Hypothalamic Neurochemical Changes in Long-Term Recovered Bilateral Subdiaphragmatic Vagotomized Rats	2022	Wistar rats	Vagotomy surgical process	Poland			The results show that, in the long term, vagotomy affects the concentration of hypothalamic amino acids, but not the mRNA expression of the genes analyzed.
23	10.3389/finbeh.2022.945661	Acute sleep deprivation disrupts emotions, cognition, inflammation, and cortisol in young healthy adults	2019	23 participants	Pittsburgh Sleep Quality, Depression Scale of the Center for epidemiological Studies (CES-D)		Average age 20.78	9 women 14 men	Lack of sleep increases negative emotional states such as anxiety, fatigue, confusion, and depression.
24	doi:10.1111/bjcr.12896 10.1097/PSY.0000000000000755	Does emotion matter? An investigation into the relationship between emotions and science learning outcomes in a game-based learning environment	2020	119 participants	Humunology, an educational game	Taiwan, China	12 and 13 years		Learning through play Humunology was effective and the long-term effect on learning retention was promising compared to education traditional.

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Doi	Title	Year of publication	Sample	Treatment	Country/ City	Mean age	Gender %	(Follow-up time)
25	Emotion Regulation and Immune Functioning During Grief: Testing the Role of Expressive Suppression and Cognitive Reappraisal in Inflammation Among Recently Bereaved Spouses	2020	99 participants	cognitive reappraisal	Houston USA		28% men	The use of emotion regulation strategies is associated with a peripheral inflammatory response as measured by peripheral inflammation levels and cytokine levels.
26	Behavioral Immune System Responses to Coronavirus: A Reinforcement Sensitivity Theory Explanation of Conformity, Warmth Toward Others and Attitudes Toward Lockdown		605 participants	RST Personality Questionnaire Anxiety Disorder Questionnaire Generalizada Perceived Vulnerability Scale Patient Health Questionnaire	Plymouth, United Kingdom		426 mujeres 173 hombres	Coronavirus-related behavior is not driven solely by fear, but also by protective and social goals to limit the spread of the virus.

them more prone to develop bidirectional psychophysiological changes between the nervous system and its articulation with the brain, due to the negative psychological manifestations that affect the determinants of health and prevent the harmonious functioning between the psyche and neurotransmitters (39).

With regard to anxiety and the modulation of the central nervous and immune systems, it affects the production of cytokines that affect cortical activation, which modifies the balance of neurotransmitters and their influence on mental pathologies (40). So the relationship with mood directly influences the hypertrophy of the adrenal glands that link emotion with anxiety and depression through the coactivation of the hypothalamic-pituitary-adrenal system characterized by adaptive mechanisms in the release of cortisol and noradrenaline that provides a release pathway induced by negative emotions that generate qualitative and quantitative changes in the anxiogenic behavior of individuals, due to the reception of cognates that generate an imbalance in the cells of the immune system causing hormonal changes that increase the level of cortisol and weaken the immune system due to the manifestations of anxiety (41).

Stress, therefore, distorts the homeostasis of the immune system, increasing the levels of probability of deteriorating health conditions due to the negative changes that occur on the immune system that progressively deteriorates the organism because stressful situations directly affect the functioning of the pituitary gland due to the sympathetic innervation that occurs between the adrenal capsules and the lymph node (42), which brings effects on the central nervous system that according to pathologies such as neoplasia, cancer, anemia, among others, cause adverse effects of psychological and psychiatric nature that are evidenced in cognitive defects, psychotic symptomatology, anorexia, somnolence and suicidal tendencies; explained from the affections and alterations that are presented in the immune system in association with the appearance of psychological stress, where alterations are identified by the immunological changes that influence the appearance of cell migration and inflammatory mediators that lead to neoplastic diseases (43).

Regarding the components of mental health, these can be altered and thus alter the function of the immune system of the subject (44), particularly in the occurrence of stress, which can directly affect emotions, generating dysfunctions in the central nervous system from the secretion of high levels of hormones and chemicals. This is explained by the conditions of association in patients who carry cancer cells, where the presence of alterations in the functioning of the immune system and the acceleration of inflammatory conditions in the body is identified. Originating changes in mood that frequently present depressive and anxiogenic symptomatology that cause alterations in behaviors, through the neurophysiological immunosuppression of the biochemical determinants that modify the central nervous system (45).

CONCLUSIONS

The affectations of the emotional states, generate changes and a series of somatic symptomatology that are evidenced due to the presence of clinical indicators related to physical pain, eating disorders, and sleep disorders among others, which leads the subject to decrease the immune system and cause alterations in the body, which negatively affect the regulation and control of emotions that are linked to the states of integral health within the proper functioning in the environmental determinant contexts in which it evolves (46). Impacting in this way, the conditions of quality of life that are linked to the health processes in individuals, under the formation of the relational elements between the immune system and brain functioning from the constructs of cortical arousal (47).

The neuroendocrine and immune systems generate developmental processes that are linked to psychological aspects that directly affect human behavior in such a way that the interaction between emotional and mental alterations generates maladaptive situations that lead to the appearance of stress, anxiety, and anxiety, due to the development of pathogens that alternate the functioning of hormones and molecules that are secreted against receptors and immune cells that secrete adrenaline, glucocorticoids, and

noradrenaline among others (48). On the other hand, corticoids are produced under the constancy of the circadian rhythm, increasing the period of stress and increasing the probability of occurrence of chronic pathologies that are linked to the poor control of emotions in daily functioning (49).

Finally, psychoneuroimmunology is a science that articulates mental processes and the functioning of the nervous, immune, and endocrine systems that affect the individual in such a way that the psychological aspects linked to emotional management and control can present better management and intervention in mental illnesses (50). This requires a multidisciplinary intervention process from the contributions of neurosciences, psychology, psychiatry, and neurobiology, to integrate the context of integral health in the individual from the psychosocial factors and in the mind-body interaction.

REFERENCES

1. Peña-Vargas C, Armaiz-Peña G. Behavioral sciences A Biopsychosocial Approach to Grief, Depression, and the Role of Emotional Regulation. *Behav Sci (Basel)*. 2021;11(8):110.
2. Kiecolt-Glaser JK, McGuire L, Robles TF, Glaser R. Emotions, morbidity, and mortality: New perspectives from psychoneuroimmunology. *Ann Rev Psychol*. 2002;53:83-107.
3. Zachariae R. Psychoneuroimmunology : A biopsychosocial approach to health and disease. *Scand J Psychol*. 2009;50(6):645-51.
4. Lugović-Mihčić L, Mihatović D, Šitum M. Psychoneuroimmunology and skin diseases. *Rad Hrvat Akad Znan i Umjet Med Znan*. 2019;537(46-47):25-36.
5. Kautz MM. Applications of psychoneuroimmunology models of toxic stress in prevention and intervention efforts across early development. *Brain, Behav Immun Heal*. 2021;16:100322.
6. D'Acquisto F. Affective immunology: Where emotions and the immune response converge. *Dialogues Clin Neurosci*. 2017;19(1):9-19.
7. Jaremka LM, Lindgren ME, Kiecolt-Glaser JK. Synergistic relationships among stress, depression, and troubled relationships: insights from psychoneuroimmunology. *Depress Anxiety*. 2013;30(4):288-296.
8. Littrell JL. The Importance of Psychoneuroimmunology for Social Workers. *Fam Soc*. 2019;100(1):17-33.
9. Shields GS, Spahr CM, Slavich GM. Psychosocial Interventions and Immune System Function: A Systematic Review and Meta-analysis of Randomized Clinical Trials. *JAMA Psychiatry*. 2020;77(10):1031-1043.
10. Murray DR, Prokosch ML, Airington Z. PsychoBehavioroimmunology: Connecting the behavioral immune system to its physiological foundations. *Front Psychol*. 2019;10:1-7.
11. Ulloa A, Sánchez R. Metaconocimientos de los estados emocionales de estudiantes de educación superior Meta-knowledge of the emotional states of higher education students. *Cienc Lat Rev Científica Multidiscip*. 2022;7:445-459.
12. Hernández-Flórez N, Moncada-Navas F, Lhoeste-Charris A, Klimenko O, Ortíz-González A. Habilidades de pensamiento crítico creativo e inteligencia emocional en estudiantes universitarios: Una revisión bibliométrica desde la literatura. *Cienc Lat Rev Científica Multidiscip*. 2022;6:2029-2054.
13. Molina J. Psiconeuroinmunología: una propuesta no inmune a la crítica. *Cent Centroamericano José Simeón*. 2020;1(1):15-18.
14. Hernández-Flórez N, Leal-Leal GA, Mogollón-Canal OM, Moreno-Salgado A, Rodríguez-Rivera D, Vergel-Rodríguez C, et al. Variables de personalidad y estilos de vida saludable en estudiantes universitarios de la Corporación Universitaria Minuto de Dios en el centro regional Cúcuta. *Inf Psicológicos*. 2020;20(2):83-94.
15. Pérez L, Moré C, González Y, Alemán A. Psychoneuroendocrinoimmunology: Claim for a comprehensive vision in medical studies. *Edumecentro*. 2019;11(3):254-261.
16. Jara C, Acuña L, Gengler J. Estrés e Inmunidad. *Medwave*. 2001;1(11):171-174.
17. Sánchez-Serrano S, Pedraza-Navarro I, Donoso-González M. How to conduct a systematic review under PRISMA protocol? Uses and fundamental strategies for its application in the educational field through a practical case study. *Bordon Rev Pedagog*. 2022;74(3):51-66.
18. Hutton B, Catalá-lópez F, Moher D. La extensión de la declaración PRISMA para revisiones sistemáticas que incorporan metaanálisis en red: PRISMA-NMA. *Med Clin (Barc)*. 2016;(xx):10-14.
19. Page M, McKenzie J, Bossuyt P. Declaración PRISMA 2020: Una guía actualizada para la publicación de las revisiones sistemáticas. *Rev Esp Cardiol*. 2021;74(9):790-799.
20. Barrios-Serna K, Orozco-Núñez D, Pérez-Navas E, Conde-Cardona G. Nuevas recomendaciones de la

- versión PRISMA 2020 para revisiones sistemáticas y metaanálisis. *Acta Neurol Colomb.* 2021;37(2):105-106.
21. Benavidez V, Flores R. La importancia de las emociones para la neurodidáctica The importance of emotions for the neurodidactics Introducción Los resultados de las investigaciones actuales en el campo de las Neurociencias. *Wimblu Rev Estud Psicol.* 2019;14(1):25-53.
 22. Bueno D. La neurociencia como fundamento de la educación emocional Neuroscience as a Basis of Emotional Education Introducción. *Rev Int Educ Emoc.* 2021;1:47-61.
 23. Bitzer-Quintero OK, Ortiz GG, Jaramillo-Bueno S, Ramos-González EJ, Márquez-Rosales MG, Delgado-Lara DLC, et al. Psycho-Neuro-Endocrine-Immunology: A Role for Melatonin in This New Paradigm. *Molecules.* 2022;27(15):4888.
 24. Vernaza-Pinz P, Posadas-PL. Dolor y emoción, una reflexión para el profesional en ciencias de la salud. *Duazary.* 2019;16(1):145-155.
 25. Soria V, Uribe J, Salvat-Pujol N, Palao D. Psiconeuroinmunología de los trastornos mentales. *Rev Psiquiatr y Salud Ment.* 2017;11:115-124.
 26. Moscoso MS. Chronic stress and the Mindfulness-Based Cognitive Therapy: A new dimension in psychoneuroimmunology. *Pers Rev la Fac Psicol.* 2010;(13):11-29.
 27. Álvaro T, Traver F. Una visión psiconeuroinmunológica de la fibromialgia. *Rev Psicopatol Psicol Clín* 2010;15(3):149-163.
 28. Linares V, Rivero R, Piqueras A, García L, Armando L. Psiconeuroinmunología: conexiones entre sistema nervioso y sistema inmune. *Suma Psicológica.* 2008;15(15):115-142.
 29. Andrea D, Actis M, Dra P, Outomuro D. Medicine and stress: Historical background and scientific evidence. *Gac Méd Caracas.* 2018;119(3):183-187.
 30. Solano R, Velásquez V. Efecto inmunomodulador del estrés psicológico. *Bárbula.* 2012;16(1):51-57.
 31. Kuthati Y, Davuluri VNG, Yang CP, Chang HC, Chang CP, Wong CS. Melatonin MT2 receptor agonist I1K-7 produces antinociception by modulation of ROS and suppression of spinal microglial activation in neuropathic pain rats. *J Pain Res.* 2019;12:2473-2485.
 32. Molina T. Psiconeuroinmunoendocrinología, emociones y enfermedad. *MedULA, Rev Fac Med Univ Los Andes.* 2009;18:155-163.
 33. Sánchez-Teruel D, Robles-Bello M. Psiconeuroinmunología: hacia la transdisciplinariedad en la salud. *Educ Médica.* 2018;19:171-178.
 34. Alessi MG, Bennett JM. Mental health is the health of the whole body: How psychoneuroimmunology & health psychology can inform & improve treatment. *J Eval Clin Pract.* 2020;26(5):1539-1547.
 35. Slavich GM. Psychoneuroimmunology of Stress and Mental Health. *The Oxford Handbook of Stress and Mental Health.* 2020:518-546.
 36. Moraes LJ, Miranda MB, Loures LF, Mainieri AG, Mármora CHC. A systematic review of psychoneuroimmunology-based interventions. *Psychol Heal Med.* 2018;23(6):635-652.
 37. Cohen S, Herbert TB. Health Psychology: Psychological Factors and Physical Disease from the Perspective of Human Psychoneuroimmunology. *Ann Rev Psychol.* 1996;47:113-142.
 38. Ehrlich KB. Attachment and psychoneuroimmunology. *Curr Opin Psychol.* 2019;25:96-100.
 39. Carrico AW, Cherenack EM, Rubin LH, McIntosh R, Ghanooni D, Chavez J V, et al. Through the Looking-Glass: Psychoneuroimmunology and the Microbiome-Gut-Brain Axis in the Modern Antiretroviral Therapy Era. *Psychosom Med.* 2022;84(8):984-994.
 40. Zachariae R. Psychoneuroimmunology: Abio-psychosocial approach to health and disease. *Scand J Psychol.* 2009;50(6):645-651.
 41. Sturmberg JP. Health and Disease Are Dynamic Complex-Adaptive States Implications for Practice and Research. *Front Psychiatry.* 2021;12.
 42. González-Díaz SN, Arias-Cruz A, Elizondo-Villarreal B, Monge-Ortega OP. Psychoneuro-immunoendocrinology: Clinical implications. *World Allergy Organ J.* 2017;10(1):19.
 43. Chen MA, Leroy AS, Majd M, Chen JY, Brown RL, Christian LM, et al. Immune and Epigenetic Pathways Linking Childhood Adversity and Health Across the Lifespan. *Front Psychol.* 2021;12:788351.
 44. Benros ME, Waltoft BL, Nordentoft M, Ostergaard SD, Eaton WW, Krogh J, et al. Autoimmune Diseases and Severe Infections as Risk Factors for Mood Disorders A Nationwide Study. *JAMA Psychiatry.* 2013;70(8):812-820.
 45. Kelley KW, Peng Y, Liu Q, Chang H, Spencer SJ, Hutchinson MR, et al. Psychoneuroimmunology goes East: Development of the PNIRS China affiliate and its expansion into PNIRS Asia-Pacific. *Brain Behav Immunity.* 2020;88:75-187.
 46. Seiler A, von Känel R, Slavich GM. The Psychobiology of Bereavement and Health: A Conceptual Review From the Perspective of Social Signal Transduction Theory of Depression. *Front Psychiatry.* 2020;11:565239.
 47. Shields GS, Kuchenbecker SY, Pressman SD, Sumida KD, Slavich GM. Better cognitive control

- of emotional information is associated with reduced pro-inflammatory cytokine reactivity to emotional stress. *Stress*. 2016;19(1):63-68.
48. Capuron L, Castanon N. Role of Inflammation in the Development of Neuropsychiatric Symptom Domains: Evidence and Mechanisms. *Brain Imaging Behav Neurosci*. 2012;289-320.
49. Chen Y, Baram TZ. Toward understanding how early-life stress reprograms cognitive and emotional brain networks. *Neuropsychopharmacology*. 2016;41(1):197-206.
50. Schulz KH, Gold S. Psychische belastung, immunfunktionen und krankheitsentwicklungen. Die psychoneuroimmunologische perspektive. *Bundesgesundheitsblatt - Gesundheitsforsch - Gesundheitsschutz*. 2006;49(8):759-772.

Psychotherapeutic treatments in patients with bipolar and schizoaffective disorders: A meta-analytic review

Tratamientos psicoterapéuticos en pacientes con trastornos bipolar y esquizoafectivo: Una revisión meta analítica

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SUMMARY

Objective: To analyze scientific publications on bipolarity and schizophrenia to detect both pharmacological and psychotherapeutic treatments that have been applied in the last five years (2018-2022).

Method: A quantitative method was applied, under the bibliometric research approach. The PRISMA method was used for this purpose. The search variables and the construction of the equations with their respective Booleans were defined. The database used was the Web of Science (WOS). After filtering by applying exclusion and inclusion criteria, a total of 23 documents were obtained for analysis.

Results: The results indicate that treatments for bipolar and schizophrenia need to be traceable, considering history, sex, age, and response to traditional treatments,

and that alternative and complementary therapies that contribute to the patient's quality of life can be tested.

Conclusions: Treatments based on cognitive behavioral therapy, as a complementary treatment to pharmacological application, improve the disposition for incorporation into the natural routine.

Keywords: Bipolarity and schizophrenia, treatments, bibliometric analysis.

RESUMEN

Objetivo: Analizar las publicaciones científicas sobre bipolaridad y esquizofrenia con la finalidad de detectar los tratamientos tanto farmacológicos como psicoterapéuticos que se han aplicado en los últimos cinco años (2018-2022).

Método: Se aplicó un método cuantitativo, bajo el

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enfoque de investigación bibliométrica. Para ello se empleó el método PRISMA. Se definieron las variables de búsqueda y la construcción de las ecuaciones con sus respectivos booleanos. La base de datos empleada es Web of Science (WOS). Luego del filtrado aplicando los criterios de exclusión e inclusión se obtuvieron un total de 23 documentos para el análisis.

Resultados: *Los resultados indican que los tratamientos para la bipolaridad y la esquizofrenia necesitan una trazabilidad, tomando en cuenta los antecedentes, el sexo, la edad y la respuesta a los tratamientos tradicionales, que se pueden probar terapias alternativas y complementarias que coadyuvan a la calidad de vida del paciente.*

Conclusiones: *Los tratamientos basados en terapia cognitiva conductual, como tratamiento complementario de la aplicación farmacológica mejoran la disposición para la incorporación a la rutina natural.*

Palabras clave: *Bipolaridad y esquizofrenia, tratamientos, análisis bibliométrico.*

INTRODUCTION

There are behavioral alterations that directly affect the adaptation processes of human beings (1), while bipolar and schizoaffective disorders are a series of difficulties with some particularities related to alterations in mood, in addition to changes in perception (2). Therefore, the condition is linked to the different ways of understanding the situations through which the subject goes through. It is important to emphasize that these difficulties can have a great impact on the functionality of patients, leading, on many occasions, to states of disability (3).

Currently, these alterations have become a global mental health problem (4), because there is great personal and family suffering. This type of problem has a fundamental characteristic of cyclical form, on the one hand, polymorphism, and on the other, alterations in mood that interfere with basic daily activities. These include hypomanic and depressive episodes (5). On the other hand, they can persist in a time characterized by euthymic states and these changes affect people's routine performance (6).

The therapeutic work that is elaborated from Beck's proposals is oriented to review the schemes of non-functional thinking that the subject suffers (7), these are established as assumptions

so that the patient must undergo evaluation and, in parallel, of those non-functional thoughts (8). This would lead to a conclusion considering the legitimacy of these non-functional and inflexible thoughts that affect in one way or another the patient in his daily performance (9).

It is important to highlight that schemas are characterized as a cognitive structure that through time achieves the acquisition of learning, classifying the information and comparing it with reality (10); that is, in many cases there is a constant belief that regularizes how a subject perceives him/herself and the environment, becoming a type of dominant beliefs (11). For this reason, psychoeducation is appealed, to mediate the development of the difficulties presented and the pathologies that may appear, it is sought that this maladaptation have a modification that does not affect the subject in his interaction with the world (12).

On the other hand, cognitive behavioral therapy strategies help to minimize the impact of environmental events that may be a source of stress for the patient; in addition to achieving appropriate management of these difficulties and an adequate way of making decisions, thus solving the problems related to bipolar and schizoaffective disorder (13). Therefore, it allows for to reduce of relapses and promotes the functioning adjusted to the psychosocial differences of the disorder, the thoughts that are of the automatic type, in the manic situation, are located in a cognitively distorted way but oriented to the positive side, that is to say, in the euphoria the patient believes to be perceived as an ingenious being (14).

Considering the above, it is fundamental that the therapeutic work with a minimum period of 12 months of a structured process and not only limited to the patient's signs, but the activities and objectives will also be fundamental (15). Consequently, critical thinking skills will be developed over time and will allow the subject to have a greater capacity and ability to adapt to different contexts and stressful situations that the subject may suffer at some point in his life (16).

There are also other methods of treatment from the third-generation therapies, which focus the intervention processes from the modification of behavior in a contextualized and globalized way. Seeking to strengthen the processes of

acceptance and behavioral activation, is important to the progress made among patients who have remission of significant symptoms, thus obtaining better control of emotional processes and interaction with other individuals (17).

It is important to point out that there are treatments from a medical model that can adequately contribute to the patient's evolution and recovery process (18). In this process, pharmacological treatment is relevant to address these difficulties. However, its interventions take different forms (19). For its part, outpatient treatment is oriented to psychotherapy processes with pharmacological support at mild levels. Meanwhile, patients with greater symptomatologic involvement with functional deficits should participate in a program with psychotherapy and pharmacological support and another interdisciplinary group such as occupational therapy and social work (20).

Behavioral changes require interdisciplinary professional accompaniment to improve the maladaptive components (21). In this sense, pharmacological therapy provides guarantees adjusted to the treatment and its adherence is very good; in fact, it is used even in cases of gender dysphoria where there is a rejection of the signifier and a reality appears from the patient's perspective, feeling that he/she is not located in his/her body and, therefore, requires another identity to feel better (22).

METHODOLOGY

PRISMA methodology (23) facilitates performing reports of the updates and thematic advances. With this it was possible to analyse from the epistemological constructs, find their reason in the evidence that denotes the specifications from the interventions, the etiological components, as well as the prevalence and prognoses. In this way, systematic reviews generate synthesized information on the scientific achievements that are identified in the contributions that account for the state of knowledge because they start from the contributions of primary studies, identifying the research problems that have been addressed from the theoretical constructs (24).

Therefore, the analyses arising from the systematic reviews, aligned with the step-by-step guide, produce contributions from innovation that are visualized given the methodological quality used in the studies that are subjected to analysis. Scientific publications present contributions due to the usefulness of the transmission and implementation of new knowledge. Considering that the conceptual aspects of the methodology used present a repetitive nature, establishing priority among them. At the same time, the possible biases that may be generated by the statistical processes used for this purpose are evaluated, guaranteeing the quality and scientific rigor employed (25).

Bibliographic search

The approach of Boolean equations was carried out using keywords, using the following "Bipolar" AND "Schizoaffective" OR "Psychotherapy" OR "Treatments" NOT "Children". The Web of Science (WOS) database was searched. A total of 3 567 articles were reviewed in the primary inclusion. Subsequently, a filter was performed by full-text access yielding 1 238 and, filtering for duplicate files and incomplete reviews, which indicated 478 documents. From this analysis, 359 were eliminated if they did not meet the criteria of the variables studied; 119 articles were pre-selected to include a total of 57 references of which 24 were eliminated due to exclusion of criteria and 10 of them due to convenience of the authors for a result of 23 selected documents.

Inclusion and exclusion criteria

For the meta-analytic review, the criteria of standardized measures were included in which data related to mean age, sample, and gender were contemplated, considering that the indicators were met in the review of the documents, in a window of observation of the last five years published exclusively in English. Thus, evaluating the therapeutic results in the follow-up times established in the treatment and intervention processes reported in the research.

For the exclusion criteria, documents were eliminated if the methodological elements did not

include the report of the treatments performed and evaluated. As well as clinical case reports and case studies that do not allow analysis from a statistical perspective. Likewise, articles published in other

languages and with special population conditions such as children and adolescents and persons deprived of liberty were not considered.

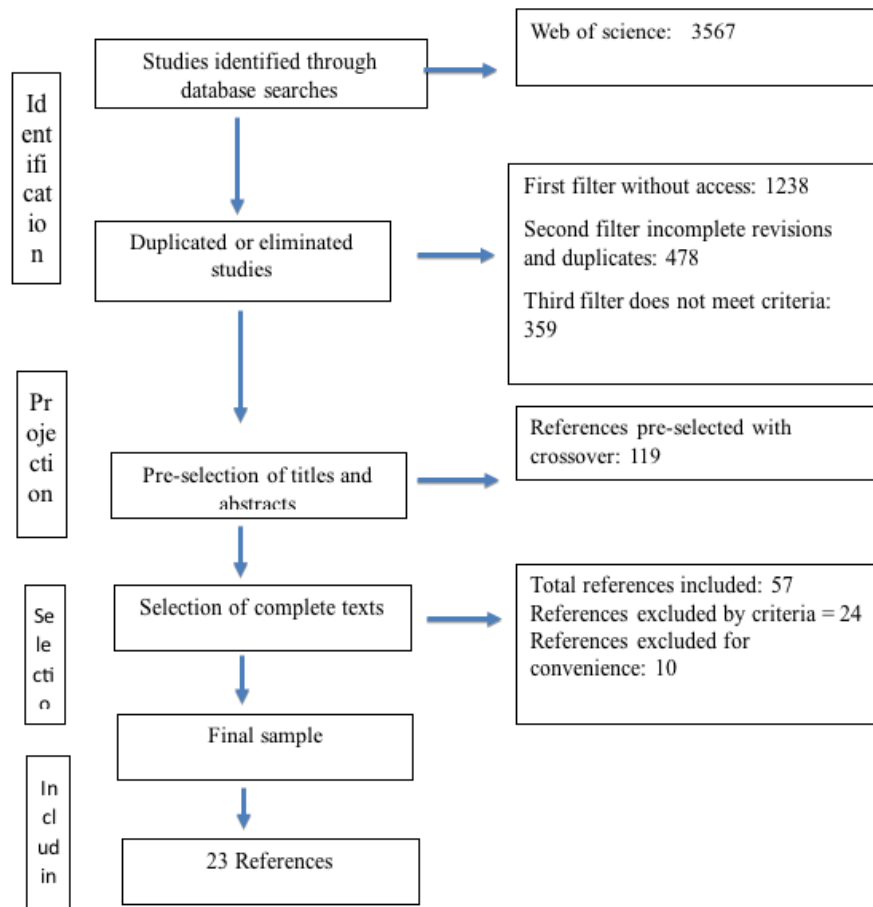


Figure 1. Flowchart of the process of study selection.

ANALYSIS BY CATEGORIES

Affective lability

The alterations of mood functioning are presented continuously in patients with a diagnosis of bipolar and schizoaffective disorder (26), considering that these are chronic pathologies. The episodes that are extrapolated

in the individual are presented throughout life in a process of cyclothymic order that varies from the appearance of hypomanic and manic episodes that, later, are transformed into depressive states (27). The manifestation of these alterations in the behavioral relationship affects the family, social and personal spheres which, according to the elements of development, have a very marked incidence in the labor aspects (28).

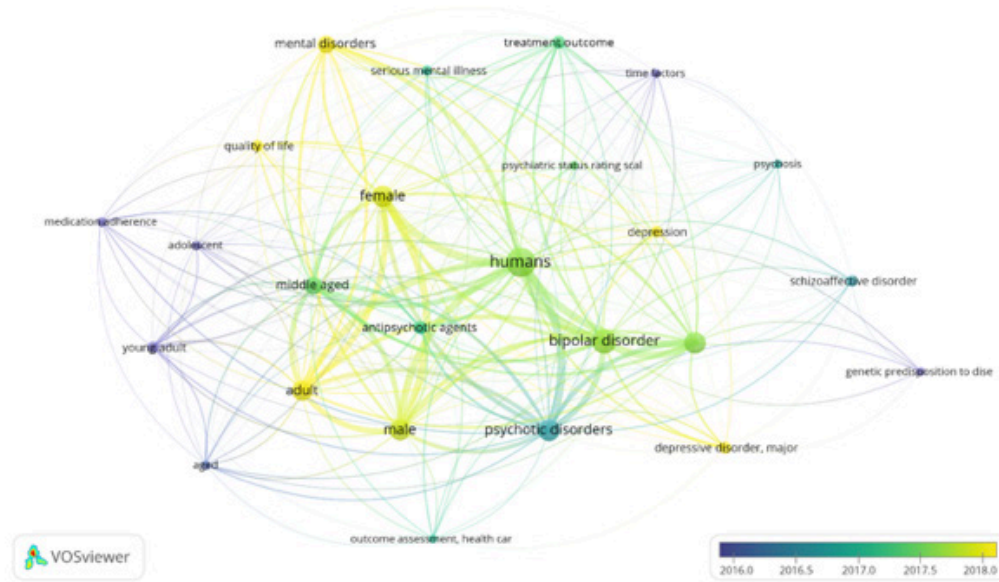


Figure 2. Keyword map the analysed topic. Own elaboration (2023)

In this way, mood changes that occur suddenly denote emotional instability; manifested in psychological discomfort that is externalized in sudden changes from crying and sadness to joy and apparent euphoria (29). According to the time duration criteria, these are established in days or weeks, which characterizes emotional lability. The emotional uncontrol of the psychopathological symptomatology represents rapid and intercalated changes in mood, which according to the theoretical constructs present a remission in time as long as there is a control and intervention from psychotherapy (30).

Psychotic symptoms

Patients with psychotic symptoms present a loss of reality and a disintegration that is accompanied by the presence of delusions and hallucinations of a perceptual, visual, and auditory type that are based on the erroneous belief of persecution or of being against them (31). This

is accompanied by a mythomaniacal discourse where they usually present claims that have never happened, and that evidence proves the contrary. Additionally, they usually present motor excitation through uncontrolled crying where victimization prevails according to the degree of delirium and an exacerbation of incoherent and nonsensical verbiage that evidence disorganization of thought and speech (32).

In this sense, psychotic outbreaks often present comorbid major conditions such as schizophreniform and schizoaffective disorders. Representing the alterations of perception of reality that alter the areas of psychological adjustment (33). In these disorders, there are no behavioral limits, which leads to the presentation of problems in the establishment of relationships, hindering the ability to differentiate reality from fantasy. Paranoid ideas lead to social isolation, which is accompanied by the experience of disorganized ideas and feelings (34).

Psychotherapy

On the other hand, it has been identified from the interventive proposals of the cognitive behavioral model that the psychotherapeutic approach in the treatment of bipolar and schizoaffective disorder (35), generates adherence in patients because they focus on the process of identification and change of maladaptive schemes that are presented in the processing of information, generating better results related to the erroneous beliefs that are addressed from the coping strategies and the identification of problems (36).

Scientific evidence has reported that mixed treatments from pharmacology with mood stabilizers in conjunction with psychotherapy focused on psychoeducation reduces automatic thoughts, as well as achieves cognitive restructuring of stressful situations, trains to alert early the identification of symptomatology before a psychotic break (37); helps to improve and maintain therapeutic adherence, since the use of cognitive strategies reduces psychosocial factors, avoiding relapses and providing support to the proposed therapeutic scheme to improve interpersonal relationships and strengthen the areas of psychological adjustment (37).

RESULTS

The results are presented in Table 1.

DISCUSSION

Therapeutic advances over time have achieved greater effectiveness in the diagnosis of bipolar affective disorder and schizotypal disorder, the appropriate approach allows in the first instance to identify the process of criteria to favorably target the treatment (38); these patients have a good response and adherence achieving better adaptations to the context, the patient manages to reduce the symptomatology from the dysfunctional thinking that may appear (39).

It can be pointed out that cognitive behavioral treatment allows one to know the central beliefs and maladaptive schemes that are determinants

in the development and evolution of the disorder and the instability of the patient (40). Therefore, establishing therapeutic techniques and procedures adjusted to the signs and symptoms manifested by the patient seeks to achieve the adaptation of the patient and eliminate the evolution and progress of the disorder due to its thought structure (41).

It is important to point out that the therapeutic techniques allow helping the patient to elaborate an invention of strategies to cope with the different situations and stimuli that generate stress, these were the factors that caused the symptomatic manifestations and amplified the difficulties of adaptation to the environment of the subject (42), while the cognitive schemes influence in a wide way in the thinking, emotions and in the way of carrying out behaviors, it is fundamental to highlight that these allow interpreting the situation, so they open spaces to quick, spontaneous thoughts that are part of the reasoning (43).

In bipolarity a disorder occurs, because it has identification and evolution of signs and symptoms that meet within the statistical criteria of the manual of classification of mental disorders, and from the pharmacological aspects (44), the treatment is fundamental and allows greater ease of adaptation and functionality to the context, within the processes of intervention of psychotropic drugs are the medications formulated to patients with the diagnosis of bipolarity and schizotypal disorders, the most frequent medications are mood stabilizers, the signs manifested by the patient can be identified as a difficulty of unstable and pathological emotion of mood states, therefore of their medical prescription, at present many patients benefit from these intervention processes to improve their condition and with the support of different therapies it is possible to improve the quality of life of patients suffering from these alterations (45).

CONCLUSIONS

The different interventions help to improve the quality and well-being of patients with bipolar and schizoaffective disorders, the cognitive-behavioral psychotherapeutic processes are adjusted and help to improve maladaptive

Table 1.

Doi	year	sample	treatment	country/ city	mean age	gender %	Results (Time to Track)
https://doi.org/10.1080/02699931.2022.2105308	2022	Sample=49 26 de standard treatment + MBCT and 23 with regular therapy.	Mindfulness-based cognitive therapy (MBCT).	Netherlands	Group 1 (Treatment as usual) = 17.3-22.0 Group 2 (Cognitive mindfulness therapy + Treatment as usual)= 18,0-28,0	1 Women (Mdn = 12.0, P25-P75 = 5.0-24.0).	Mindfulness-based cognitive therapy + usual therapy decreases negative self-referential memory bias.
http://dx.doi.org/10.3928/00485713-20221110-01	2022	Early treatment group (n = 26).	Aripiprazole	Seül, Korea.	Between 18 and 65 years old.	Adult men and women	Adjuvant treatment with aripiprazole as a therapeutic alternative for patients with depression
https://doi.org/10.1371/journal.pone.0279073	2022	Delayed treatment group (n = 20). 15 respondents with bipolar disorder used psilocybin.	Psilocybin or "magic mushrooms"	EEU and Canada.	Between 27 and 50 years old.	Between 27 and 50 years old.	Mental health decreases the impact and severity of depression, improves emotions, and there is greater relaxation and sleep. But, it aggravates mania and distressing sensory experiences
https://doi.org/10.1002/mp.212282	2022	Sample=47 Hospitalized=22 with psychotic depression. Non-hospitalized=25 with non-psychotic depression.	Electroconvulsive therapy + benzodiazepines	Akita, Japan	64-67 years.	Women (Group 1=87.0%) Men (Group 1=13.0%)	There is no difference in the use of benzodiazepine receptor agonists at the end of electroconvulsive therapy.

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Doi	year	sample	treatment	country/ city	mean age	gender %	Results (Time to Track)
https://doi.org/10.1186/s40345-022-00280-6	2022	162 patients	No medication was administered	USA	41.4 years	60.5% Woman	Alcohol abuse in psychotic patients increases hospital care and refers to hallucinations, and suicide attempts.
https://doi.org/10.1186/s40345-022-00267-3	2022	Total sample = 134 Group resistant= 68 Vulnerable group = 55 Highly vulnerable group= 11.	Not applicable.	Germany.	44.3 years The standard deviation of were women. 13.3 years.	Of the total Coresistant patients sample, 64.2% have advantages because they achieve improvements in anxiety symptoms and social function compared to highly vulnerable personality patients.	
https://doi.org/10.1186/s40345-021-00248-y	2022	Final sample = 94	Patients received pharmacological and psychotherapeutic treatment.	Germany, Austria, and Denmark	44.3 years (SD = 13.3).	64.2% of the participants were women.	Higher vulnerability predicts a higher rate of long-term morbidity.
10.1186/s40345-022-00194-4	2022	Sample= 60	Not applicable	Türkiye	17.87 years	Men (54.3 %) Woman (45.7)	Children and adolescents with bipolar disorder decreased need for sleep, increased speech, irritability, recurrent episodes, and social anxiety disorder.
doi:10.1136/bcr-2022-252721	2022	Case study. A patient with Cotard	Treatment should be tailored to the	Luisiana, USA	30 years	Woman	Treatment for people with Cotard

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Doi	year	sample	treatment	country/ city	mean age	gender %	Results (Time to Track)
doi:10.1192/bjpo.2022.582	2022	Syndrome Type II. Sample = 50 Group exp=25 Grupo control= 25	patient's symptoms and underlying diagnosis. Recovery Focused Therapy for Bipolar Disorder (RFT-OA) over a 12-week period.	England	The average age is 67 (SD = 6) years.	Men, n=38 (97%) Women, n=26 (67%)	syndrome should be tailored to the patient's symptoms and underlying diagnosis. Clinical assessment measures provide evidence of effectiveness on a variety of outcomes, including mood symptoms, time to relapse, and functioning. The intervention to improve the lifestyle and physical conditions of patients requires intensive interventions.
doi:10.1192/bjpo.2022.590	2022	Sample = 88	Nurse accompaniment.	Australia.	Mean age = 19.4 (±3.4) years.		
https://doi.org/10.1017/S003329172000478X	2022	Healthy group= 280 Diagnosis of schizophrenia=189 Diagnosis of mood stabilizer schizophrenia= 185 Bipolar diagnosis= 96	1st and 2nd generation antipsychotics Mood stabilizer Antidepressant Stimulant Anticholinergic	Boston Chicago Dallas Georgia Hartford (USA)	33.8	Woman Healthy group= 64% Diagnosis of schizophrenia= 40% Schizoaffective diagnosis=55% Bipolar diagnosis=54%	Antisaccade in cases of psychosis indicates a specific deficit of higher-order cognitive aspects of the saccade.
https://doi.org/10.1371/journal.pone.0276504	2022	Inpatients 65 years of age years old.		Alberta, Ontario Canada	65 years	bipolar Does not report	The COVID -19

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Doi	year	sample	treatment	country/ city	mean age	gender %	Results (Time to Track)
https://doi.org/10.3390/ijms23179968	2022	Does not report	Chemical and physical restraint during acute care hospitalization of older adults	Australia	Over 18 years	Men and women	pandemic resulted in chemical/containment in hospitals. Physical restraint orders increased from 5.9% to 8.3% and remained elevated for the eight weeks at other hospitals.
doi:10.3928/00485713-20220817-01	2022	1 Man 44 years old.	Multiple ECT sessions	Nueva York	44 years	Male	To understand the application of biomarkers in the detection/treatment of various diseases. The efficacy and safety of ECT produce significant improvement in catatonic patients.
https://formative.jmir.org/2022/8/e36444	2022	N=366	Use of the Wilcoxon rank-sum test followed by multiple comparisons	United States	18 years and older	Men and women	Persons with clinical diagnosis of COVID-19 with high frequencies of violent behaviors, and psychotic symptoms resulting from COVID-19.
https://doi.org/10.1016/j.	2022	N=55 patients	Assessment by means of a	Australia	Over 18 years old	Men and women	Assessment of perception related to

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Doi	year	sample	treatment	country/ city	mean age	gender %	Results (Time to Track)
https://doi.org/10.3389/fnhum.2022.958169	2022	N=247	scale to check neuropsychiatric components Supply of psychiatric drugs	USA Oklahoma	Over 18 years old	Men and women	beliefs may improve the ability to evaluate delusional beliefs. Concussions associated with medication adherence. relationship between traumatic brain injury and adherence to treatment.
https://doi.org/10.1371/journal.pone.0270506	2021	N=185	Combination of genomic information with plasma pentosidine levels	Japan Tokyo	Over 18 years old	Men and women	Modification of IMP2L Functions to treat PEN-SCZ if the organic mechanism can be improved.
https://doi.org/10.1016/j.comppsy.2022.152313	2022	N = 150	Depressive medication and evaluation of depressive symptoms		Over 18 years old	Men and women	Importance of medical care for mental disorders, with greater depressive symptomatology
doi:10.1192/bjpo.2022.536	2022	N = 1022	Review of stressors in patients	USA	Over 18 years old	Men and women	Potential prediction to stratify high-risk individuals into likely AAO groups, for provision of treatment and timely intervention.
https://doi.org/10.3389/fnins.2022.879703	2022	N = 182	Higher-ranking biomarkers to meaningfully correlate patient symptoms	China	Over 18 years old	Men and women	Probable the AAO, for provision of treatment and timely intervention.

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Doi	year	sample	treatment	country/ city	mean age	gender %	Results (Time to Track)
https://doi.org/10.1111/ppc.12483	2020	Patients with bipolar disorder= 47 Schizophrenic patients= 45.		Türkiye	Patient with bipolar disorder. 43.53 ± 14.28 Patients with schizophrenia =44.31 ± 12.76	Bipolar disorder Women with= 31 (66.0%) Men= 16 (34%) Schizophrenia Woman=13 (28.9%) Men= 32 (71.1%)	ind the association between brain structure and dynamic brain. And help identify significant biological biomarkers of schizophrenic. Patients with bipolar disorder had more significant side effects than schizophrenic patients.

behavior, generate changes from the construction of a daily routine considering hygiene and daily tasks, so that the recurrence rates decrease significantly, on the other hand, psychoeducation with the family promotes a more functional social bonding (46).

Treatment with psychotropic drugs has a fundamental role because it has a vital function and helps to prevent relapses, these interventions articulated with psychotherapeutic work allow to improve clinical management and help the patient to adhere to treatment (47). In addition, the evidence of the changes in the way of facing life also allows us to recognize some signs that can destabilize the patient and act on these aspects.

Cognitive-behavioral intervention therapies have great benefits since they allow to achieve a reflective process so that the patient can realize his difficulty and can mobilize, understand what happened, and make the appropriate mourning of that lost object, to reinvent himself and generate changes from a new position in front of the world, with this it is sought to process all those components of the patient's history that generate discomfort in him over time (48). All these treatments produce changes and improve the patient's quality of life, the adaptation to the context and the elimination of non-adjusted or maladaptive behaviors is the objective of psychotherapeutic treatments.

REFERENCES

1. Andrade-González N, Hernández-Gómez A, Álvarez-Sesmero S, Gutiérrez-Rojas L, Vieta E, Reinares M, et al. The influence of the working alliance on the treatment and outcomes of patients with bipolar disorder: A systematic review. *J Affect Disord.* 2020;260:263-271.
2. Karanti A, Bublik L, Kardell M, Annerbrink K, Lichtenstein P, Runeson B, et al. Patient educational level and management of bipolar disorder. *BJPsych Open.* 2021;7(2):e63.
3. Cearns M, Amare AT, Schubert KO, Thalamuthu A, Frank J, Streit F, et al. Using polygenic scores and clinical data for bipolar disorder patient stratification and lithium response prediction: machine learning approach. *Br J Psychiatry.* 2022;220(4):219-228.
4. Yildiz A, Vieta E, Leucht S, Baldessarini RJ. Efficacy of antimanic treatments: Meta-analysis of randomized,

- controlled trials. *Neuropsychopharmacology*. 2011;36(2):375-389.
5. Moot W, Crowe M, Inder M, Eggleston K, Frampton C, Porter R. Functional and Mood Outcomes in Bipolar Disorder Patients With and Without Substance Use Disorders Undergoing Psychotherapy. *Front Psychol*. 2021;12:661458.
 6. Merikangas KR, Jin R, He J, Kessler RC, Lee S, Sampson NA, et al. Prevalence and Correlates of Bipolar Spectrum Disorder in the World Mental Health Survey Initiative. *NIH public access*. 2012;68(3):241-251.
 7. Bellman V, Russell N, Depala K, Dellenbaugh A, Desai S, Vadukapuram R, et al. Challenges in Treating Cancer Patients With Unstable Psychiatric Disorder. *World J Oncol*. 2021;12(5):137-148.
 8. McIntyre RS, Berk M, Brietzke E, Goldstein BI, López-Jaramillo C, Kessing LV, et al. Bipolar disorders. *Lancet*. 2020;396(10265):1841-1856.
 9. Crowe M, Porter R, Inder M, Carlyle D, Luty S, Lacey C, et al. Clinical effectiveness trial of adjunctive interpersonal and social rhythm therapy for patients with bipolar disorder. *Am J Psychother*. 2020;73(3):107-114.
 10. Rosendahl J, Alldredge CT, Burlingame GM, Strauss B. Recent developments in group psychotherapy research. *Am J Psychother*. 2021;74(2):52-59.
 11. Irfan M, Muzaffar S, Kingdon D, Rathod S, Naeem F. Psychotherapy for schizophrenia and bipolar disorder [Internet]. *Global Mental Health and Psychotherapy: Adapting Psychotherapy for Low- and Middle-Income Countries*. Elsevier Inc. 2019:223-239.
 12. Kalman JL, Loohuis LMO, Vreeker A, McQuillin A, Stahl EA, Ruderfer D, et al. Characterization of age and polarity at onset in bipolar disorder. *Br J Psychiatry*. 2021;219(6):659-669.
 13. Saraf G, Moazen-Zadeh E, Pinto JV, Ziafat K, Torres IJ, Kesavan M, et al. Early intervention for people at high risk of developing bipolar disorder: A systematic review of clinical trials. *Lancet Psychiatry*. 2021;8(1):64-75.
 14. Rao S, Heidari P, Broadbear JH. Developments in diagnosis and treatment of people with borderline personality disorder. *Curr Opin Psychiatry*. 2020;33(5):441-446.
 15. Hendin HM, Penn AD. An episode of mania following self-reported ingestion of psilocybin mushrooms in a woman previously not diagnosed with bipolar disorder: A case report. *Bipolar Disord*. 2021;23(7):733-735.
 16. Kirchner SK, Lauseker M, Adorjan K, Anderson-Schmidt H, Anghelescu IG, Baune BT, et al. Medication Adherence in a Cross-Diagnostic Sample of Patients From the Affective-to-Psychotic Spectrum: Results From the PsyCourse Study. *Front Psychiatry*. 2022;12(January):713060.
 17. Leichsenring F, Steinert C, Rabung S, Ioannidis JPA. The efficacy of psychotherapies and pharmacotherapies for mental disorders in adults: An umbrella review and meta-analytic evaluation of recent meta-analyses. *World Psychiatry*. 2022;21(1):133-145.
 18. Leopold K, Bauer M, Bechdolf A, Correll CU, Holtmann M, Juckel G, et al. Efficacy of cognitive-behavioral group therapy in patients at risk for serious mental illness presenting with subthreshold bipolar symptoms: Results from a prespecified interim analysis of a multicenter, randomized, controlled study. *Bipolar Disord*. 2020;22(5):517-529.
 19. Crowe M, Inder M, Douglas K, Carlyle D, Wells H, Jordan J, et al. Interpersonal and social rhythm therapy for patients with major depressive disorder. *Am J Psychother*. 2020;73(1):29-34.
 20. Gibson-Smith D, Bot M, Milaneschi Y, Twisk JW, Visser M, Brouwer I a., et al. Identifying profiles of patients with bipolar I disorder The body of research that is focused on functional outcomes has who would benefit from maintenance therapy with a grown in recent years, with the Global Assessment of Functioning and long-acting inj. *J Clin Psychiatry*. 2015;77:22-27.
 21. McIntyre RS, Alda M, Baldessarini RJ, Bauer M, Berk M, Correll CU, et al. The clinical characterization of the adult patient with bipolar disorder aimed at personalization of management. *World Psychiatry*. 2022;21(3):364-387.
 22. Hernández-Flórez N, Lhoeste-Charris A, Martínez-Gómez I, González-Martelo V, Orozco-Santander M, Arguello-rueda J. Psychological factors of gender dysphoria in adolescents: A systematic review. *Gac Méd Caracas*. 2022;130(Supl 3):743-755.
 23. Page M, McKenzie J, Bossuyt P. Declaración PRISMA 2020: Una guía actualizada para la publicación de las revisiones sistemáticas. *Rev Esp Cardiol*. 2021;74(9):790-799.
 24. Hutton B, Catalá-López F, Moher D. La extensión de la declaración PRISMA para revisiones sistemáticas que incorporan metaanálisis en red: PRISMA-NMA. *Med Clin (Barc)*. 2016;147(6):262-266.
 25. Sánchez-Serrano S, Pedraza-Navarro I, Donoso-González M. How to conduct a systematic review under PRISMA protocol? Uses and fundamental strategies for its application in the educational field through a practical case study. *Bordon Rev Pedagog*. 2022;74(3):51-66.
 26. Depp CA, Moore DJ, Patterson TL, Lebowitz BD, Jeste DV. Psychosocial interventions and medication adherence in bipolar disorder. *Dialogues Clin Neurosci*. 2008;10(2):239-250.
 27. Perrotta G. Psychotic spectrum disorders: Definitions, classifications, neural correlates and clinical profiles. *Ann Psychiatry Treat*. 2020;1:070-084.

28. Inoue T, Sano H, Kojima Y, Yamada S, Shirakawa O. Real-world treatment patterns and adherence to oral medication among patients with bipolar disorders: A retrospective, observational study using a healthcare claims database. *Neuropsychiatr Dis Treat.* 2021;17:821-833.
29. Stamm TJ, Zwick JC, O'Malley G, Sondergeld LM, Hautzinger M. Adjuvant psychotherapy in early-stage bipolar disorder: study protocol for a randomized controlled trial. *Trials.* 2020;21(1):1-11.
30. Bogren M, Soltesz M, Hjorth S. Remission of Persistent Negative Symptoms and Psychosocial Consequences by Combined Clozapine and Cariprazine Treatment in a Patient With Long-Standing Treatment-Resistant Schizoaffective Disorder. *Front Psychiatry.* 2022;13:887547.
31. Afshari B, Shiri N, Ghoreishi FS, Valianpour M. Examination and Comparison of Cognitive and Executive Functions in Clinically Stable Schizophrenia Disorder, Bipolar Disorder, and Major Depressive Disorder. *Depress Res Treat.* 2020;2020:2543541.
32. Jaworska-Andryszewska P, Rybakowski JK. Childhood trauma in mood disorders: Neurobiological mechanisms and implications for treatment. *Pharmacol Reports.* 2019;71(1):112-120.
33. Mirhaj Mohammadabadi MS, Mohammadsadeghi H, Eftekhar Adrebili M, Partovi Kolour Z, Kashaninasab F, Rashedi V, et al. Factors associated with pharmacological and psychotherapy treatments adherence in patients with borderline personality disorder. *Front Psychiatry.* 2022;13:1056050.
34. Jauhar S, Ratheesh A, Davey C, Yatham LN, McGorry PD, McGuire P, et al. The case for improved care and provision of treatment for people with first-episode mania. *Lancet Psychiatry.* 2019;6(10):869-876.
35. Tadmon D, Olfson M. Trends in Outpatient Psychotherapy Provision by U.S. Psychiatrists: 1996-2016. *Am J Psychiatry.* 2022;179(2):110-121.
36. Dubovsky SL, Ghosh BM, Serotte JC, Cranwell V. Psychotic Depression: Diagnosis, Differential Diagnosis, and Treatment. *Psychother Psychosom.* 2021;90(3):160-177.
37. Steardo L, Luciano M, Sampogna G, Zinno F, Saviano P, Staltari F, et al. Efficacy of the interpersonal and social rhythm therapy (IPSRT) in patients with bipolar disorder: Results from a real-world, controlled trial. *Ann Gen Psychiatry.* 2020;19(1):1-7.
38. Keepers GA, Fochtmann LJ, Anzia JM, Benjamin S, Lyness JM, Mojtabai R, et al. The American psychiatric association practice guideline for the treatment of patients with schizophrenia. *Am J Psychiatry.* 2020;177(9):868-872.
39. Lana F, Martí-Bonany J, Sanz-Correcher P, Pérez V, Irimia A. Brief day hospital mentalization based group psychotherapy for schizophrenia spectrum disorders: A feasibility study. *Actas Esp Psiquiatr.* 2020;48(2):64-74.
40. Wang S, Zhang Z, Yao L, Ding N, Jiang L, Wu Y. Bright light therapy in the treatment of patients with bipolar disorder: A systematic review and meta-analysis. *PLoS One.* 2020;15(5):1-19.
41. Skryabin VY, Vinnikova MA, Ezhkova E V., Titkov MS, Bulatova RA. Atypical antipsychotics in the treatment of patients with a dual diagnosis of schizophrenia spectrum disorders and substance use disorders: the results of a randomized comparative study. *J Addict Dis.* 2021;39(4):513-525.
42. Vetrano IG, Bonomo G, Messina G. Alternatives to Pharmacological and Psychotherapeutic Treatments in Psychiatric Disorders. *Psychiatry Int.* 2021;2(1):1-24.
43. Slotema CW, Wilhelmus B, Arends LR, Franken IHA. Psychotherapy for posttraumatic stress disorder in patients with borderline personality disorder: A systematic review and meta-analysis of its efficacy and safety. *Eur J Psychotraumatol.* 2020;11(1).
44. Maguen S, Li Y, Madden E, Seal KH, Neylan TC, Patterson OV, et al. Factors associated with completing evidence-based psychotherapy for PTSD among veterans in a national healthcare system. *Psychiatry Res.* 2019;274:112-128.
45. Oladapo Ajayi P, Olusola Ibirongbe D, Ipinnimo TM, Solomon OO, Ibikunle AI, Obiagwu AE. The Prevalence of Household Catastrophic Health Expenditure in Nigeria: A Rural-Urban Comparison *J Heal Med Sci.* 2021;4(2):94-105.
46. Njau S, Townsend J, Wade B, Helleman G, Bookheimer S, Narr K, et al. Neural Subtypes of Euthymic Bipolar I Disorder Characterized by Emotion Regulation Circuitry. *Biol Psychiatry Cogn Neurosci Neuroimaging.* 2020;5(6):591-600.
47. Lo SB, Huber CG, Meyer A, Weinmann S, Luethi R, Dechent F, et al. The relationship between psychological characteristics of patients and their utilization of psychiatric inpatient treatment: A cross-sectional study, using machine learning. *PLoS One.* 2022;17(4):1-15.
48. Ayyagari R, Thomason D, Mu F, Philbin M, Carroll B. Association of antipsychotic treatment switching in patients with schizophrenia, bipolar, and major depressive disorders. *J Med Econ.* 2020;23(2):204-212.

Effect of Cognitive Behavioral Therapy on The Behavior of Patients with Cardiovascular Disease: A Systematic Review

Efecto de la Terapia Cognitivo Conductual en el Comportamiento de Pacientes con Enfermedad Cardiovascular: Una revisión sistemática

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SUMMARY

Background: Cardiovascular disease (CVD) has been known to be one of the most common causes of death in the community. One of the factors that affect the condition of patients with cardiovascular disease is unhealthy behavior. Cognitive-behavioral Therapy (CBT) is a therapy to improve patient behavior from bad to better behavior. This study aims to synthesize various research results on the effect of Cognitive-Behavioural Therapy (CBT) on the behavior of patients with cardiovascular disease.

Materials and Methods: Systematic review. A literature search was carried out on international journal databases, namely Scopus, Science Direct, and PubMed, from 2016 to 2021. The synthesized articles were those that met the PICOS inclusion criteria, namely Population = people with cardiovascular disease. Intervention = cognitive behavioral therapy. Comparison = usual care. Outcome = healthy behavior, study design: trial. The keywords used

in the search were “Cognitive Behavioral Therapy” AND “cardiovascular”.

Result: There are 416 articles found in the search. Articles were identified and screened resulting in seven articles that met the inclusion criteria. The results of this study found that the effects of cognitive behavioral therapy on cardiovascular disease patients were able to overcome insomnia or rest and sleep disorders, overcome anxiety, stress, and symptoms of depression, improve lifestyle and healthy living behaviors such as physical activity, and reduce smoking habits, and a healthy diet, improved coping skills and pain control, and improved mental health and quality of life of patients with cardiovascular disease. The average duration of therapy was 7.95 or about 8 weeks.

Conclusion: CBT is effective in improving various healthy behaviors in patients with cardiovascular disease. However, pharmacological therapy or treatment regimens remain the main ones supported by CBT to produce a better impact on the health of CVD patients.

Keywords: Cognitive-Behavioural Therapy, CBT, Cardiovascular Disease

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RESUMEN

Antecedentes: Se sabe que la enfermedad cardiovascular (ECV) es una de las causas más comunes de muerte en la comunidad. Uno de los factores que afectan la condición de los pacientes con enfermedades cardiovasculares es el comportamiento poco saludable. La Terapia Cognitivo-Conductual (TCC) es una terapia para mejorar el comportamiento del paciente de mal a mejor comportamiento. Este estudio tiene como objetivo sintetizar varios resultados de investigación sobre el efecto de la Terapia Cognitivo-

Conductual (TCC) en el comportamiento de los pacientes con enfermedad cardiovascular.

Materiales y Métodos: *Revisión sistemática. Se realizó una búsqueda bibliográfica en bases de datos de revistas internacionales, a saber, Scopus, Science Direct y PubMed, de 2016 a 2021. Los artículos sintetizados fueron aquellos que cumplieron con los criterios de inclusión de PICOS, a saber, Población = personas con enfermedad cardiovascular. Intervención = terapia cognitiva conductual. Comparación = atención habitual. Resultado = comportamiento saludable, diseño del estudio: ensayo. Las palabras clave utilizadas en la búsqueda fueron "Terapia cognitiva conductual" Y "cardiovascular". Resultado: Hay 416 artículos encontrados en la búsqueda. Los artículos fueron identificados y examinados dando como resultado siete artículos que cumplían con los criterios de inclusión. Los resultados de este estudio encontraron que los efectos de la terapia cognitiva conductual en pacientes con enfermedades cardiovasculares fueron capaces de superar el insomnio o los trastornos del sueño y del sueño, superar la ansiedad, el estrés y los síntomas de depresión, mejorar el estilo de vida y los comportamientos de vida saludable, como la actividad física, y reducir los hábitos de fumar, y una dieta saludable, mejores habilidades de afrontamiento y control del dolor, y mejor salud mental y calidad de vida de los pacientes con enfermedades cardiovasculares. La duración media de la terapia fue de 7,95 o unas 8 semanas.*

Conclusión: *La TCC es efectiva para mejorar varios comportamientos saludables en pacientes con enfermedades cardiovasculares. Sin embargo, la terapia farmacológica o los regímenes de tratamiento siguen siendo los principales apoyados por la TCC para producir un mejor impacto en la salud de los pacientes con ECV.*

Palabras clave: *Terapia cognitivo-conductual, TCC, enfermedad cardiovascular.*

INTRODUCTION

Cardiovascular diseases (CVDs) are the leading cause of death globally for approximately 17.9 million people each year. Cardiovascular disease is a type of disease in the heart and blood vessels such as coronary heart disease, cerebrovascular disease or stroke, rheumatic heart disease, and other conditions. About four out of five patients with cardiovascular disease die of heart attack and stroke (1).

The main risk factor for death in patients with cardiovascular disease in the community is behavioral factors. An unhealthy diet, lack of physical activity, tobacco use, harmful alcohol use, anxiety, stress, and lack of rest and sleep are behaviors that are most at risk of causing death in patients with cardiovascular disease (1,2). Cessation of tobacco use, diet reducing the use of salt in diet, consuming lots of fruit and vegetables, regular physical activity, and not consuming alcohol are healthy behaviors that have been shown to reduce the risk of death in patients with cardiovascular disease. Interventions that create a conducive environment are essential to motivate patients with cardiovascular disease to adopt and maintain healthy behaviors (1).

Cognitive behavioral therapy (CBT) is a type of cognitive behavioral therapy that is structured by cooperating with patients. Cognitive behavior therapy aims to help patients change their cognitive and behavioral assessments from unhealthy ones to healthy, evidence-based, and adaptive assessments of cognitive and behavioral health (3). CBT has been widely studied and proven to be able to overcome various psychological health problems in patients with mental health problems. The application of CBT in patients with cardiovascular disease has also been discussed and is useful in overcoming psychological problems such as anxiety, stress, and depression (4,5). This study aims to synthesize various research results to see in general the effect of cognitive behavioral therapy (CBT) on various conditions or behaviors of cardiovascular disease patients in a wider and more diverse range.

METHODS

Study Design

This study is a systematic review to determine the results of research on the effect of cognitive behavioral therapy on the behavior of patients with cardiovascular disease. This research was conducted using the PRISMA systematic approach without conducting a meta-analysis test on quantitative data (6).

Search strategy

The literature search was conducted on three international journal databases, namely Scopus, Science Direct, and PubMed. The literature search was conducted using the keywords “Cognitive Behavioral Therapy” and “Cardiovascular”.

Study selection

The search results have obtained four hundred and sixteen literature or articles in the database used. Articles were removed from duplicates and filtered by title to 409, filtered by abstract to 27, and full text filtered to 7 (Figure 1).

Eligibility Criteria

Eligibility criteria for articles used in this study are publications in 2016-2021 that meet the inclusion criteria of the PICOS framework, namely Population: cardiovascular disease patients, Intervention: Cognitive Behavioral Therapy, Comparison: Usual care, Outcome: Healthy behavior, and Study Design: Randomized Controlled Trial, Pre-Post Study, Quasi Experiment.

Risk of bias

Assessment of article quality and risk of bias was carried out independently by the research team using the Critical Appraisal Joanna Briggs Institute (JBI) (7).

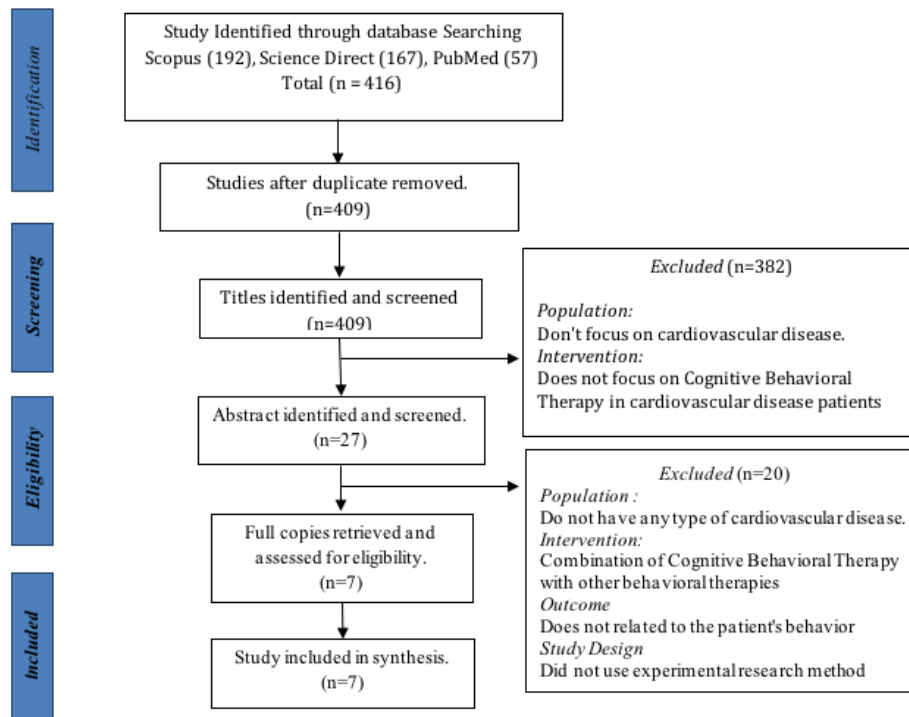


Figure 1. PRISMA flow diagram of the article selection process (8).

Data extraction

Predefined articles were extracted based on the researcher, year, country, research design, types of cardiovascular disease, research sample, patient's condition or behavior, forms of CBT intervention in the treatment group, action duration, the form of treatment in the control group, and research result on the effect of cognitive behavioral therapy on the behavior of patients with cardiovascular disease.

RESULTS

Characteristic study

All seven articles that have been synthesized are original research with a randomized controlled trial study design, 6 articles, and 1 article with a pre-post-trial study design. The total of all cardiovascular disease patients who were found to be involved in this study was 765 people. as many as 399 people (52.15 %) became the intervention group in CBT therapy and 366 people (47.8 %) became the control group. Most of the patients, namely 522 people (68.2 %) were male and 243 people (31.8 %) were female. Types of cardiovascular disease experienced by patients are angina pectoris, myocardial infarction, heart failure, atrial fibrillation, arrhythmias, coronary heart disease, cardio-metabolic syndrome (CMS), coronary artery bypass, and aortic or mitral valves replacement. The patient's unhealthy condition or behavior is insomnia, anxiety, depressive symptoms, stress, somatic anxiety, vital fatigue, unhealthy lifestyle; smoking, diet, physical activity, and depression on postoperative pain control (Table 1).

Outcomes

The results of this study found various impacts of CBT in patients with cardiovascular disease was to be able to overcome insomnia or rest and sleep disorders, treat anxiety, stress, and depressive symptoms, improve lifestyle and healthy living behaviors such as physical activity, smoking reduction, and healthy diet improved coping skills and pain control, and improved mental health and quality of life of

patients. Based on the results of the synthesis of articles, it was found that the average duration of cognitive behavioral therapy actions given was 7.95 or about 8 weeks (Table 1).

DISCUSSION

The results indicate that many positive effects are obtained when cognitive behavioral therapy is given to patients with various conditions or behaviors due to suffering from cardiovascular disease. Insomnia is a sleep disorder condition that begins with an attempt to start sleeping, maintain sleep, wake up too early, or experience poor sleep (15,16). Insomnia has been found to have a significant association with cardiovascular events and mortality (15-17). The high incidence of cardiovascular diseases associated with insomnia is stroke, myocardial infarction (MI), and coronary heart disease (15,18,19). Patients who experience insomnia and have difficulty initiating sleep have a high risk of death from cardiovascular disease. This condition occurs because insomnia increases anxiety, stress, and interferes with mental health which worsens cardiovascular disease (20). CBT has been shown not only to be effective in reducing insomnia symptoms, but also to have a positive effect over time in improving the functional health, psychological well-being, and quality of life of patients (21,22). CBT also holds promise as an effective insomnia treatment for reducing morbidity in patients with cardiovascular disease (23).

Anxiety, stress, and depression are psychological problems that greatly affect the health of patients with cardiovascular disease (24). Psychological and cognitive responses to stress play a role in triggering heart disease, risk of death, and the need for rehabilitation (25-27). Depression is prospectively associated with the development of atherosclerosis in individuals with no history of cardiovascular disease, but in someone with heart disease, depression conditions will worsen and increase the risk of death and heart deterioration 2-fold after myocardial infarction or heart failure and after heart surgery (28). Depression that occurs in patients with cardiovascular disease is generally a result of an impaired adjustment of patients to

Table 1: Summary of findings on the effect of Cognitive Behavioral Therapy on the behavior of patients with cardiovascular disease (n=7)

No	Researcher, Year	Country	Research design	Types of cardiovascular disease	Sample	Patient's condition or behavior	Forms of CBT Intervention in the Treatment Group	Duration	Form of treatment in the control group	Research result
1	Siebmanns et al. 2021 (2)	Sweden	a randomized controlled trial	Angina pectoris, myocardial infarction, heart failure, atrial fibrillation and atrial flutter, and arrhythmias	48 patients 31 men (65%), and 17 women (35.4%), average age of 72.5 years	Insomnia	Cognitive behavioral therapy (CBT) is internet-based in the form of modules	9 weeks	The self-study program contains several modules without receiving support and feedback from health workers	The intervention has a good treatment effect on insomnia problems in CVD patients during the treatment and follow-up period
2	Schneider et al. 2020 (9)	Canada	a randomized controlled trial	Myocardial infarction or unstable angina	53 patients 31 men (58.5%), and 22 women (41.5%), average age 58 years	Anxiety and depressive symptoms	Cognitive behavioral therapy (CBT) in the form of a Heart Wellbeing Course	8 weeks	No intervention; waiting for the opportunity to receive intervention after the eight-week waiting period ends.	Decreased patient general anxiety, depression, distress, cardiac anxiety, and increased physical activity behavior, mental health, and improved quality of life

Continued in page S483 ...

„continuation Table 1: Summary of findings on the effect of Cognitive Behavioral Therapy on the behavior of patients with cardiovascular disease (n=7)

No	Researcher, Country Year	Research design	Types of cardiovascular disease	Sample	Patient's condition or behavior	Forms of Intervention or the Treatment Group	Form of treatment in the control group	Research result
3	Heenan et al. 2020(10)	Pre-post trial study	Myocardial infarction, arrhythmia	47 patients 25 men (53.2%), and 22 women (45.8%), average age 62 years people in the control group	Insomnia, anxiety, and depression	Cognitive behavioral therapy (CBT) in the form of the Heart Healthy Sleeping Group (HHSBG)	No control group	Improved sleep duration, maintenance, efficiency, latency, and sleep quality, and decreased symptoms of anxiety and depression
4	Johansson et al. 2020(11)	a randomized controlled trial	Myocardial infarction/angina, atrial fibrillation, heart failure	144 patients 89 men (61.8%), 55 women (38.2%), average age 63 years. 72 people in the intervention group, 72 people in the control group	Depression	Cognitive behavioral therapy (CBT) is internet-based in the form of modules	Online discussion	Decreased depressive symptoms and increased physical activity.

Continued in page S484 ...

„continuation Table 1: Summary of findings on the effect of Cognitive Behavioral Therapy on the behavior of patients with cardiovascular disease (n=7)

No	Researcher, Country Year	Research design	Types of cardiovascular disease	Sample	Patient's condition or behavior	Forms of Intervention the Treatment Group	Action in duration	Form of treatment in the control group	Research result
5	Norlund et al. 2017(12)	a randomized controlled trial	Coronary heart disease	362 patients 277 men (76.5%), and 85 women (23.5%), average age of 61.5 years 192 people in the intervention group, 170 people in the control group	Stress, somatic anxiety, vital exhaustion, and depression	Cognitive behavioral therapy with face-to-face meetings	0 and 11 months, the average intervention was 26 days or about 3.7 weeks	Usual care	CBT has a moderately positive effect on somatic anxiety
6	Zhang et al. 2016(13)	Republic of China randomized controlled trial	Cardio-metabolic syndrome	58 patients Male 25 (43.1%), female 33 (56.9%), average age 48.6 years 28 people in the intervention group, 30 people in the control group	Lifestyle; smoking, diet, lack of physical activity	Patient-centered therapy (PC-CBT) in the form of workshops equipped with modules	12 weeks	Usual information via weekly text messages about CMS standard care	Improvement of physical and mental health conditions due to lifestyle changes; smoking reduction, healthy diet, and good physical activity

Continued in page S485 ...

„continuation Table 1: Summary of findings on the effect of Cognitive Behavioral Therapy on the behavior of patients with cardiovascular disease (n=7)

No	Researcher, Country Year	Research design	Types of cardiovascular disease	Sample	Patient's condition or behavior	Forms of CBT or Intervention in the Treatment Group	Action Form of treatment in the control group	Research result
7	Doering et al. 2016(14)	United States of America	Coronary artery bypass, aortic or mitral valve replacement, a combination of both	53 patients Male (83.01%), female 9 (16.9%), average age 66 years 33 people in the intervention group, 20 people in the control group	Depression, postoperative pain control	Cognitive behavioral therapy with face-to-face meetings Eight sessions in one hour nurse and patient	Usual care	Decreased depressive symptoms, improved coping skills and pain control after cardiac surgery, and improved quality of life

the latest health conditions that are not realized will worsen their health conditions (29,30). Depression is significantly associated with an increased risk of cardiovascular disease morbidity and should therefore be screened and treated (31). CBT is a therapy that has a high intensity in overcoming the psychological problems of patients with cardiovascular disease (24,32). CBT is an effective treatment for reducing depression and anxiety in patients with cardiovascular diseases such as heart failure and coronary heart disease (33).

A healthy lifestyle can substantially reduce the burden of cardiovascular disease (34). Regular physical activity, a healthy diet, an ideal body weight, and not smoking have been shown to significantly reduce the risk of cardiovascular disease (35). Unhealthy behavior or lifestyle predicts a higher risk of being the cause of death in all cases of death in cardiovascular disease patients, namely myocardial infarction and stroke, regardless of genetic risk (36). CBT can improve a person's behavior or healthy lifestyle such as nutritional intake, exercise, and weight control (37). The CBT intervention also increased commitment and adherence to regular physical exercise in sports (38) and commitment to quitting smoking (39).

Pain can increase or worsen the risk of cardiovascular disease condition. Patients who report pain may indicate a significant heart disease problem (40). CBT has a significant relationship with the patient's ability to empathize and control pain (41). Quality of life is a strong and independent predictor of all causes of death and hospitalization for cardiovascular disease patients, namely heart failure, both mild and severe (5,42). CBT is a reliable psychological therapy for improving the quality of life of patients with cardiovascular disease (9,14).

Cognitive-behavioral therapy (CBT) is a combination of behavioral and cognitive therapy that focuses mostly on working with patients. CBT is generally a directive approach to psychotherapy that helps patients to challenge their troubled thoughts to become new and better thoughts (43). In this study, various CBT approaches were found to be given to patients with cardiovascular disease, namely face-to-face CBT and internet-based CBT. Whatever approach

is taken, whether face-to-face or via the internet, CBT in patients with cardiovascular disease must require modules to produce a better impact. Some important topics in the module that are good for CBT intervention in cardiovascular patients are having an introduction, the subject of living with cardiac disease, sleep, heart disease and sleep problems, stimulus control, sleep restriction, thoughts that contribute to sleeping badly, stress related to heart disease that can contribute to sleep problems, and completion (2). In CBT to improve a healthy lifestyle for patients with cardiovascular disease, the module topics can include breaking the ice, interacting with each other deeply, talking about health, lifestyle, methods in psychological adjustment, and patient-centered, viable lifestyle change program (13). In CBT for dealing with stress, subjects may include health education, self-monitoring, skills training, cognitive restructuring, and spiritual development (12). The results of this study also found that the average duration of CBT that can be given to patients with cardiovascular disease is 7.95 or about 8 weeks. Although CBT has many significant positive effects on several behaviors that can worsen the condition of patients with cardiovascular disease, adjustment of psychosocial interventions and pharmacological therapy or treatment regimens should be prioritized to produce a greater positive impact on the health of CVD patients (25).

Study Limitations

This systematic review has limitations. One of them is that it did not perform a statistical meta-analysis of the data. In addition, the data obtained in this study are limited data on the effects of CBT in patients with cardiovascular disease. However, this study allowed to obtain evidence indicating that CBT is an important therapy of choice in improving healthy behavior in patients with cardiovascular disease.

CONCLUSION

Cognitive behavioral therapy (CBT) in patients with cardiovascular disease can overcome various conditions and behaviors, namely insomnia or

rest and sleep disorders, treat anxiety, stress, and symptoms of depression, and improve lifestyle and healthy lifestyle behaviors such as physical activity, smoking reduction, healthy diet, improvement of coping skills and pain control, and improvement of mental health and quality of life of patients with cardiovascular disease. Although CBT has many positive effects, adjustment of CBT interventions and pharmacological therapy or treatment regimens remain the main ones supported by CBT to produce a better impact on the health of CVD patients.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

REFERENCES

1. WHO. Cardiovascular diseases. 2021; Available from: https://www.who.int/health-topics/cardiovascular-diseases#tab=tab_1
2. Siebmans S, Johansson P, Ulander M, Johansson L, Andersson G, Broström A. The effect of nurse-led Internet-based cognitive behavioural therapy for insomnia on patients with cardiovascular disease: A randomized controlled trial with 6-month follow-up. *Nurs Open*. 2021;8(4):1755-1768.
3. Beck AT, Dozois DJA. Cognitive therapy: Current status and future directions. *Ann Rev Med*. 2011;62:397-409.
4. Pedersen SS, Andersen CM, Ahm R, Skovbakke SJ, Kok R, Helmark C, et al. Efficacy and cost-effectiveness of a therapist-assisted web-based intervention for depression and anxiety in patients with ischemic heart disease attending cardiac rehabilitation [eMind YourHeart trial]: A randomised controlled trial protocol. *BMC Cardiovasc Disord*. 2021;21(1):20.
5. Johansson P, Svensson E, Andersson G, Lundgren J. Trajectories and associations between depression and physical activity in patients with cardiovascular disease during participation in an internet-based cognitive behavioural therapy programme. *Eur J Cardiovasc Nurs*. 2020;124-131.
6. PRISMA. Welcome to the Preferred Reporting Items for Systematic Reviews and. 2020; Available from: <https://www.prisma-statement.org/>
7. JBI. Critical Appraisal Tools. Joanna Briggs Inst. 2020; Available from: <https://jbi.global/critical-appraisal->

- tools%0Ahttps://jbi.global/critical-appraisal-tools%0Ahttps://jbi.global/critical-appraisal-tools?msckid=13a37d7ab52d11ec8cff276f44fef232
8. PRISMA. PRISMA Flow Diagram. Available from: <https://www.prisma-statement.org//PRISMAStatement/FlowDiagram>
 9. Schneider LH, Hadjistavropoulos HD, Dear BF, Titov N. Efficacy of internet-delivered cognitive behavioural therapy following an acute coronary event: A randomized controlled trial. *Internet Interv.* 2020;21:100324.
 10. Heenan A, Pipe A, Lemay K, Davidson JR, Tulloch H. Cognitive-Behavioral Therapy for Insomnia Tailored to Patients With Cardiovascular Disease: A Pre-Post Study. *Behav Sleep Med.* 2020;18(3):372-385.
 11. Johansson P, Svensson E, Andersson G, Lundgren J. Trajectories and associations between depression and physical activity in patients with cardiovascular disease during participation in an internet-based cognitive behavioural therapy program. *Eur J Cardiovascular Nursing.* 2021;20, 124-131.
 12. Norlund F, Olsson EM, Pingel R, Held C, Svärdsudd K, Gulliksson M, et al. Psychological mediators related to clinical outcome in cognitive behavioural therapy for coronary heart disease: A sub-analysis from the SUPRIM trial. *Eur J Prev Cardiol.* 2017;24(9):917-925.
 13. Zhang Y, Mei S, Yang R, Chen L, Gao H, Li L. Effects of lifestyle intervention using patient-centered cognitive behavioral therapy among patients with cardio-metabolic syndrome: A randomized, controlled trial. *BMC Cardiovasc Disord.* 2016;16(1).
 14. Doering L V, McGuire A, Eastwood J-A, Chen B, Bodán RC, Czer LS, et al. Cognitive behavioral therapy for depression improves pain and perceived control in cardiac surgery patients. *Eur J Cardiovasc Nurs.* 2016;15(6):417-424.
 15. Edwards KS, Hoover V. Insomnia and Heart Disease. *Am Coll Cardiology.* 2016; Available from: <https://www.acc.org/latest-in-cardiology/articles/2016/08/02/07/25/insomnia-and-heart-disease>
 16. Sofi F, Cesari F, Casini A, Macchi C, Abbate R, Gensini GF. Insomnia and risk of cardiovascular disease: A meta-analysis. *Eur J Prev Cardiol.* 2014;21(1):57-64.
 17. Frøjd LA, Munkhaugen J, Moum T, Sverre E, Nordhus IH, Papageorgiou C, et al. Insomnia in patients with coronary heart disease: Prevalence and correlates. *J Clin Sleep Med.* 2021;17(5):931-938.
 18. Larsson SC, Markus HS. Genetic Liability to Insomnia and Cardiovascular Disease Risk. *Circulation.* 2019;140(9):796-798.
 19. Zheng B, Yu C, Lv J, Guo Y, Bian Z, Zhou M, et al. Insomnia symptoms and risk of cardiovascular diseases among 0.5 million adults: A 10-year cohort. *Neurology.* 2019;93(23):E2110-20.
 20. Andersen ML, Poyares D, Tufik S. Insomnia and cardiovascular outcomes. *Sleep Sci.* 2021;14(1):1-2.
 21. Espie CA, Emsley R, Kyle SD, Gordon C, Drake CL, Siriwardena AN, et al. Effect of Digital Cognitive Behavioral Therapy for Insomnia on Health, Psychological Well-being, and Sleep-Related Quality of Life: A Randomized Clinical Trial. *JAMA Psychiatry.* 2019;76(1):21-30.
 22. Redeker NS, Jeon S, Andrews L, Cline J, Mohsenin V, Jacoby D. Effects of Cognitive Behavioral Therapy for Insomnia on Sleep-Related Cognitions Among Patients With Stable Heart Failure. *Behav Sleep Med.* 2019;17(3):342-354.
 23. Samantha Conley, Redeker NS. Cognitive Behavioral Therapy for Insomnia in the Context of Cardiovascular Conditions. *Curr Sleep Med Rep.* 2015;1(3):157-165.
 24. Sommaruga M, Angelino E, Porta PD, Abatello M, Baiardo G, Balestroni G, et al. Best practice in psychological activities in cardiovascular prevention and rehabilitation: Position Paper. *Monaldi Arch Chest Dis.* 2018;88(2):47-83.
 25. Von Känel R. Psychosocial stress and cardiovascular risk - Current opinion. *Swiss Med Wkly.* 2012;142(1):1-13.
 26. Chauvet-Gelinier JC, Bonin B, Cohen BE, Edmondson D, Kronish IM, Celano CM, et al. State-of-the-art review: Depression, stress, anxiety, and cardiovascular disease. *Am J Hypertens.* 2017;60(11):1-14.
 27. Chauvet-Gelinier JC, Bonin B. Stress, anxiety and depression in heart disease patients: A major challenge for cardiac rehabilitation. *Ann Phys Rehabil Med.* 2017;60(1):6-12.
 28. Celano CM, Shapter C, Styra R, Czick M. Depression and anxiety in cardiac disease. *Psychiatr Times.* 2016;33(12):1-14.
 29. Levy R. Distress, Depression, Anxiety and Cardiovascular Disease : A Call to Action. *J Clin Prev Cardiology.* 2014;(4):107-140.
 30. Hare DL, Toukhsati SR, Johansson P, Jaarsma T. Depression, and cardiovascular disease: A clinical review. *Eur Heart J.* 2014;35(21):1365-1372.
 31. Ivanovs R, Kivite A, Ziedonis D, Mintale I, Vrublevska J, Rancans E. Association of depression and anxiety with the 10-year risk of cardiovascular mortality in a primary care population of Latvia using the SCORE system. *Front Psychiatry.* 2018;9:1-14.
 32. Hudiyawati D, Prakoso AM. Effectiveness of Cognitive Behavioral Therapy to Reduce Depression,

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- Anxiety and Stress among Hospitalized Patients with Congestive Heart Failure in Central Java. *J Ners*. 2020;14(3):367-373.
33. Pizga A, Kordoutis P, Tsikrika S, Vasileiadis I, Nanas S, Karatzanos E. Effects of cognitive behavioral therapy on depression, anxiety, sleep and quality of life for patients with heart failure and coronary heart disease. A systematic review of clinical trials 2010 – 2020. *Heal Res J*. 2021;7(3):123.
 34. Lv J, Yu C, Guo Y, Bian Z, Yang L. Europe PMC Funders Group Adherence to healthy lifestyle and cardiovascular diseases in Chinese. *J Am Coll Cardiol*. 2017;69(9):1116-1125.
 35. Rippe JM. Lifestyle Strategies for Risk Factor Reduction, Prevention, and Treatment of Cardiovascular Disease. *Am J Lifestyle Med*. 2019;13(2):204-212.
 36. Livingstone KM, Abbott G, Ward J, Bowe SJ. Unhealthy Lifestyle, Genetics and Risk of Cardiovascular Disease and Mortality in 76,958 Individuals from the UK Biobank Cohort Study. *Nutrients*. 2021;
 37. Jiskoot G, Timman R, Beerthuizen A, Dietz de Loos A, Busschbach J, Laven J. Weight Reduction Through a Cognitive Behavioral Therapy Lifestyle Intervention in PCOS: The Primary Outcome of a Randomized Controlled Trial. *Obesity*. 2020;28(11):2134-2141.
 38. Derakhshanpour A, Mousavi MKV, Taheri H. The effect of the special cognitive-behavioral intervention on the commitment to exercise and adherence to the exercise routine. *Ann Appl Sport Sci*. 2018;6(2):61-68.
 39. Onyechi KCN, Eseadi C, Umoke PCI, Ikechukwu-Illomuanya AB, Out MS, Obidoa JC, et al. Effects of a group-focused cognitive behavioral health education program on cigarette smoking in a sample of Nigerian prisoners. *Med (United States)*. 2017;96(1):1-8.
 40. Fayaz A, Watt HC, Langford RM, Donaldson LJ. The Association between Chronic Pain and Cardiac Disease A Cross-sectional Population Study. *Clin J Pain*. 2016;32(12):1062-1068.
 41. Lim JA, Choi SH, Lee WJ, Jang JH, Moon JY, Kim YC, et al. Cognitive-behavioral therapy for patients with chronic pain: Implications of gender differences in empathy. *Med (United States)*. 2018;97(23).
 42. Ewnetu Tarekegn G, Derseh Gezie L, Yemanu Birhan T, Ewnetu F. Health-Related Quality of Life Among Heart Failure Patients Attending an Outpatient Clinic in the University of Gondar Comprehensive Specialized Hospital Northwest, Ethiopia, 2020: Using Structural Equation Modeling Approach. *Patient Relat Outcome Meas*. 2021;12:279-290.
 43. Rice RH. Cognitive-Behavioral Therapy. *Fish Digit Publ*. 2015; Available from: <https://core.ac.uk/download/pdf/213033752.pdf>

Conceptualizaciones del cuidado informal y su contribución a la visibilidad del cuidador¹

Conceptualizations of informal caregiving and its contribution to the visibility of the caregiver

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RESUMEN

Este artículo tiene como propósito realizar una reflexión en torno a las conceptualizaciones que surgen del cuidado informal y su contribución a la visibilidad del cuidador. Se resalta la necesidad de dar a conocer la labor del cuidador informal con especial énfasis en el género, el manejo del estrés, el desarrollo de estrategias de afrontamiento, el autocuidado, la mejora de la calidad de sueño y el tiempo que dedican su labor. Se hizo la reflexión basada en el Manual

del Cuidado al Cuidador de personas con trastornos mentales y/o enfermedades crónicas discapacitantes y las Políticas de Cuidado internacional, los cuales reúnen los aspectos teóricos para conceptualizar el tema y lograr la visibilidad del cuidador. Es inherente priorizar a los cuidadores dentro del sistema de salud como sujetos de atención con un enfoque de género desde la promoción, prevención y atención en salud mental.

Palabras clave: *Cuidador informal, género, estrés, afrontamiento, autocuidado.*

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SUMMARY

The purpose of this article is to reflect on the conceptualizations of informal caregiving and its contribution to the visibility of the caregiver. It highlights the need to publicize the work of the informal caregiver with special emphasis on gender, stress management, development of coping strategies, self-care, improvement of sleep quality, and the time they devote to their work. Reflection was made based on the Caregiver Care Manual for people with mental disorders and/or chronic disabling diseases and the international Care Policies, which bring together the theoretical aspects to conceptualize the topic and achieve the visibility of the caregiver. It is inherent to prioritize caregivers within the health system as subjects of care with a gender approach from the promotion, prevention, and care of mental health.

Keywords: *Informal caregiver, gender, stress, coping, self-care.*

INTRODUCCIÓN

La labor del cuidador informal tiene un impacto en la persona que provee el cuidado, por lo que es necesario trabajar por la salud del cuidador desde los esfuerzos de la Psicología y las políticas públicas sobre el cuidado. Esto sugiere la importancia de dar una mayor visibilidad a la tarea de cuidar desde un trabajo articulado entre los actores clínicos, sociales y comunitarios que reconocen el desgaste físico, social y mental que sufren los cuidadores informales, quienes presentan problemas de salud asociado a la falta de preparación para afrontar las condiciones que demanda la labor de cuidado (1). Este trabajo pretende visibilizar un fenómeno que apenas se empieza a investigar, debido a que la sociedad siempre se fija en la persona con discapacidad y no en la persona que provee el cuidado (1).

La compilación de normas expedidas en Colombia relacionadas con el cuidador informal de discapacidad busca la protección de la persona cuidadora, promocionando la salud mental, y la participación en procesos que incluyan la educación en salud y el manejo de los problemas que emergen de la labor del cuidado informal; esto mediante las rutas de atención, el conocimiento de los derechos y deberes del cuidador y su participación en grupos de apoyo de la comunidad y apoyo social.

En ese sentido, el Manual del cuidado al cuidador de personas con trastornos mentales y/o enfermedades crónicas discapacitantes (2) y las Políticas del Cuidado (3), hacen énfasis en las situaciones en las que las familias deben afrontar dificultades relacionadas a la enfermedad de uno de sus integrantes, lo que genera diferentes problemas en su salud física y mental, especialmente estrés e incertidumbres asociadas a enfermar y a cuidar a quien se enferma. En ese sentido, se menciona la repercusión que tiene el cuidado de una enfermedad no solo en la persona que la padece, sino en toda su familia.

Se consideran tres elementos principales en esta reflexión: la temática del cuidado informal, las posiciones alternas de mayor relevancia respecto al tema y la posición del autor haciendo énfasis en las conceptualizaciones de: género, estrés, afrontamiento, autocuidado, calidad de sueño y tiempo de cuidado. Por lo tanto, el propósito de esta es realizar una reflexión en torno a las conceptualizaciones que surgen del cuidado informal y su contribución a la visibilidad del cuidador.

MÉTODO

Se siguió un proceso de búsqueda del Manual del cuidado al cuidador de personas con trastornos mentales y/o enfermedades crónicas discapacitantes y las políticas del cuidado, en complemento con artículos de las bases de datos de Mesh: PubMed y Scopus, sobre la posición de otros autores respecto al tema, usando los descriptores “cuidadores informales” “políticas de cuidado”, “género”, “estrés” y “afrontamiento”. Se aplicó el criterio de que cada par de términos aparecieran enunciados en el título de artículo o el resumen, identificándose un total de 21 documentos susceptibles para la reflexión.

REFLEXIÓN

Conceptualización sobre el género

Según García-Cantillo y Reyes-Ruiz (4), el género constituye la principal categoría en la comparación de experiencias de cuidadores

informales. Además, el cuidado informal, es considerado una labor femenina (5), siendo esta una situación que lleva a las mujeres a ser el principal soporte histórico de la tarea de cuidar (3). Siguiendo a García-Cantillo y col. (6), existen diferencias en las experiencias de cuidadores masculinos y femeninos que pueden ser contrastadas con lo que se ha encontrado en Colombia sobre desigualdad de género en la labor de los cuidadores; y en América Latina, donde el cuidado no remunerado es realizado mayoritariamente por la mujer (7), teniendo en cuenta que, en cuestiones de género: el cuidado es desproporcionado (8), debido a que las madres cuidadoras que no trabajan en el sector formal, son impulsadas a trabajar por cuenta propia. No obstante, las políticas de cuidado (9), proponen incorporar a las mujeres cuidadoras al mercado laboral, con el fin de reducir el trabajo no remunerado (10). Por su parte, Mathias y col. (5), afirman que el cuidado informal recae sobre los hombros de la mujer; quienes suelen dedicarse horas al cuidado con un compromiso afectivo, y, en el caso de las mujeres cabezas de hogar, se encuentran aisladas y económicamente privadas, sin embargo, se caracterizan por poseer un sentido de unidad familiar y fortaleza en su capacidad para asumir su papel de cuidador.

El cuidador informal sigue siendo el sujeto más importante para la persona dependiente. Los autores consideran que la personificación de este sujeto continúa siendo la mujer (11). Los estudios han mencionado que la mayoría de las cuidadoras principales son hijas (12), a lo que se suma el patrón cultural en donde la mujer queda considerada como el personaje principal que provee el soporte emocional en el núcleo familiar (13).

Por su parte, Fabio y Barrero (14), mencionan que, en el caso de las cuidadoras; aunque asumen el papel de las madres, intentan asimilar el hecho de que su vida no solo puede darse dentro de lo asignado históricamente como femenino, es decir, que además de desempeñarse como madres cuidadoras, también deben salir adelante asumiendo un papel de mujer, sin dejar de lado el cuidado de un hogar. En concordancia con lo anterior, la actividad del cuidado ha llevado a la mujer a ejercer papeles que histórica y socialmente han sido asignados al hombre, asumiendo el papel de cabezas de familia.

Esto tiene consecuencias relevantes para la conceptualización de género por la condición de las mujeres en la sociedad (3), porque, cuando ellas son las principales proveedoras del cuidado de una persona dependiente, empiezan a excluirse del mercado laboral o enfrentar mayores dificultades que sus pares masculinos.

Efectos sobre la salud según el género

La conceptualización de género en el estudio del cuidado informal ha demostrado que, la principal diferencia entre el hombre y la mujer cuidador radica en la conciencia de autocuidado (1). Los hombres presentan frecuentemente menor malestar físico y emocional que las mujeres (1), las cuales suelen padecer más problemas de ansiedad y depresión, menor bienestar subjetivo y calidad de sueño, peor salud física y mayor sedentarismo (15). También se ha asociado la peor salud en la mujer por su mayor implicación en el cuidado, así como al mayor número de horas dedicadas al mismo (1). Junto a ello, se ha señalado la presencia del estrés que afecta la red social, específicamente en las mujeres, considerado como un estrés crónico (11). En el caso de las madres solteras, se hace mucho más evidente la necesidad de apoyo social, lo que se encuentra asociado con la retirada de la vida social. Con respecto al momento del diagnóstico, los sentimientos y recuerdos varían tanto en hombres como en mujeres; los hombres tienden a enfocarse en lo positivo; mientras que las mujeres hacen énfasis en lo que dejaron de hacer y no han podido lograr a nivel económico y personal; sin embargo, en el presente intentan salir adelante mediante formas de emprendimiento (1).

Con respecto a lo anterior, es pertinente considerar el estrés en el cuidador, debido a que los problemas de salud mental tienen efectos profundos sobre el comportamiento y las habilidades efectivas de los cuidadores, asimismo, se puede prevenir y tratar el deterioro atribuible a los problemas de salud mental, así como la disminución de la calidad de vida.

Conceptualización sobre Estrés y Afrontamiento

La persona con discapacidad y cuidador informal deben afrontar diariamente las demandas

de su labor. Se considera que, el apoyo a un familiar con discapacidad puede constituir una fuente importante de estrés (16). Desde esta perspectiva, el modelo de estrés más utilizado para conceptualizar el afrontamiento ha sido el modelo transaccional del estrés de Lazarus y Folkman (17). Desde esta perspectiva se asume que, ante una situación específica que es fuente de estrés, el individuo pone en marcha una serie de valoraciones o significados sobre la situación que le causa el malestar emocional. Si esta valoración resulta negativa, es decir, si el individuo percibe que no dispone de los recursos de afrontamiento necesarios para hacer frente a la demanda, surge el estrés. Por lo que, es importante la valoración que hace el cuidador de los recursos que posee para hacer frente a la tarea de cuidar; así como la actitud que asume sobre las demandas de su labor, además de la capacidad de afrontamiento que tiene ante estas. En general, aquellos cuidadores que ponen en marcha estrategias activas y centradas en el problema muestran mejor salud que aquellos que utilizan estrategias pasivas y centradas en la emoción (11). De esta forma, serían las estrategias de afrontamiento ante los eventos estresores, lo que lo convierte al cuidador informal en una persona resiliente. En consecuencia, hay presencia de estrés en las mujeres cuidadoras de hijos con discapacidad y ausencia de estrés en los hombres cuidadores, esto está relacionado con los sentimientos de angustia, soledad, y hostilidad desde el momento del diagnóstico de su hijo y por la intensidad horaria diaria con la que dedican a su labor (1).

De acuerdo con Ruiz-Robledillo y Moya-Albiol (11), la búsqueda de apoyo social es una manera de afrontar que ha mostrado tener un efecto amortiguador en los niveles de estrés. En relación con lo anterior, se ha demostrado que (1), los hombres cuidadores vivencian la labor del cuidado informal como una oportunidad y una fortaleza, en la medida en que pueden demostrar su honor como padres (Estrategia de afrontamiento: Reevaluación positiva); en este sentido, los sentimientos y vivencias alrededor del fenómeno de cuidado se distinguen de la mujer, porque la tarea de cuidar, los hace sentir orgullosos; no obstante, hacen evidente la necesidad del apoyo femenino (Estrategia de Afrontamiento: Búsqueda de apoyo social), aun cuando ellos se encuentran asumiendo de manera activa su papel como cuidador informal

(Estrategia de afrontamiento: Planificación y Aceptación de la responsabilidad). Por otro lado, las mujeres reaccionaron desde el momento del diagnóstico, con angustia, estrés, síntomas de ansiedad, y hostilidad, en la medida en que manifestaron sentimientos de soledad y desesperanza (Estrategias de Afrontamiento: Confrontación, Huida-evitación, Distanciamiento); esto justificado en la intensidad con la que ellas se dedican al cuidado, realizando incluso, tareas manuales (Estrategias de Afrontamiento: Planificación, Aceptación de la responsabilidad) (1). Por lo tanto, es importante pensar en el afrontamiento como amortiguador de las consecuencias e implicaciones que tiene el cuidado informal sobre la salud física, mental y social (18).

Conceptualización de autocuidado, calidad de sueño y tiempo que dedican al cuidado diario

Según Miranda y Aravena (19), el autocuidado se refiere a la acción intencionada y calculada, que está condicionada por el conocimiento y repertorio de habilidades de un individuo, y se basa en la premisa que los individuos saben cuándo necesitan ayuda y, por lo tanto, son conscientes de las acciones específicas que necesitan realizar, pudiendo escoger entre distintas opciones en sus conductas de autocuidado. Basado en esta definición, se considera el autocuidado como la práctica de actividades que los cuidadores informales realizan cada día en su propio beneficio para el mantenimiento de la calidad de vida, la salud y el bienestar.

El autocuidado es una acción esencial que debe estar inmersa en todos los momentos de la vida tanto de la persona cuidadora como de la persona sujeto de cuidado y sus familias, buscando generar autonomía, estilos de vida saludables, manejo del estrés, fortalecimiento del desarrollo personal y del proyecto de vida, así como la toma de decisiones para cuidar la salud y la salud mental (2). Respecto a esto, no solo el afrontamiento es clave en el abordaje terapéutico del cuidador informal, también lo es la práctica del autocuidado, en la medida en que funciona en el manejo del estrés (1).

De otro modo, se considera que la calidad del sueño puede tener un impacto sobre varios

aspectos de la calidad de vida de los cuidadores, especialmente en el deterioro de la salud física; y que la ayuda al mejoramiento del sueño enseña a los cuidadores informales a atenderse a sí mismos (15). De igual forma, los deterioros en la salud física y mental del cuidador pueden influir negativamente en la persona que necesita sus cuidados, constituyéndose nuevamente la importancia entre cuidador y persona que requiere el cuidado. Esto depende del tiempo que dedican al cuidado diario; las mujeres cuidadoras tienden a dedicar entre 16 y 24 horas diarias de cuidado, mientras que, los hombres entre 8 y 12 horas (1).

En este orden de ideas, el hecho de prestar cuidados de forma prolongada supone un estresor de carácter crónico que conlleva serias consecuencias para la salud del cuidador, afectando directamente su calidad de vida (11). Además, depende el tiempo que tenga cuidando, aumentan los síntomas de carácter emocional (20). En consecuencia, se destaca el alto porcentaje de cuidadores que ha dejado de realizar actividades por el hecho de cuidar, quienes no reciben remuneración económica por la actividad de cuidado, así como tampoco reciben reconocimiento social. Estas condiciones del cuidado, sumado al tiempo dedicado a esta actividad por años y a la responsabilidad por otras personas, develan las demandas de la labor del cuidado informal. Estos aspectos han sido objeto de otros estudios para muchos autores quienes reconocen la importancia de dar visibilidad a los costos emocionales y económicos que implica el papel de cuidador informal (21).

Finalmente, se reconoce la relación entre la discapacidad y el cuidado al cuidador, reconociendo la importancia de ambos “sujetos de cuidado” (1). Asimismo, que los profesionales de la salud también consideren la salud física y psicosocial del cuidador, ya que esto también puede tener un impacto la persona a quien cuida (21).

CONCLUSIONES

A partir de la reflexión propuesta, se reconoce que, la ineffectividad para manejar el estrés en la vida del cuidador informal es un coadyuvante

para los problemas de salud. Respecto a esto, es importante considerar la salud física y mental de las personas cuidadoras informales, teniendo como referencia que, los problemas de salud mental también pueden provocar efectos profundos sobre la salud física y las enfermedades que emergen del cuidado informal. A partir de las conceptualizaciones del cuidado informal, donde el abordaje de las personas con discapacidad también incluya el apoyo psicológico, físico, legislativo, laboral, económico y social del cuidador, se propone desarrollar trabajos enfocados en el afrontamiento, el autocuidado y la percepción del papel de cuidador, por las horas dedicadas a su labor y su afectación en su calidad de sueño. Esta necesidad de “cuidar al cuidador” y de mirarlo como “sujeto de cuidado”, se enmarca desde un enfoque de género, que propende trabajar en las repercusiones físicas y emocionales del cuidado, especialmente en las mujeres cuidadoras; pero también en aportar en la visibilidad de la labor de cuidado y la persona a quien cuida, reconociéndolos finalmente como sujetos de cuidado importantes para el sistema de salud, la ciencia, la comunidad de la que hacen parte y, la legislación.

REFERENCIAS

1. García-Cantillo C, Reyes-Ruiz L. Reacciones adaptativas de cuidadores informales de un hijo con diagnóstico de discapacidad en el departamento del Atlántico (Tesis Doctoral). Barranquilla: Universidad Simón Bolívar; 2021. Disponible en: <https://bonga.unisimon.edu.co/handle/20.500.12442/9136>
2. Manual del cuidado al cuidador de personas con trastornos mentales y/o enfermedades crónicas discapacitantes. Convenio 547 de 2015. Colombia: MinSalud; 2016. Disponible en: <https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/VS/PP/ENT/Manual-cuidado-al-cuidador.pdf>
3. Bathyány K. Políticas del cuidado. México: CLACSO; 2021 (consultado 2021 mayo 16). Disponible en: <https://www.clacso.org/wp-content/uploads/2021/04/Políticas-cuidado.pdf>
4. García-Cantillo C, Reyes-Ruiz L. Aspectos que impactan la vida de las madres cuidadoras de hijos en situación de discapacidad. En: Reyes-Ruiz L, Carmona Alvarado F, Sánchez Villegas M, editores. Aproximaciones psicológicas y teóricas de las acciones

CONCEPTUALIZACIONES DEL CUIDADO INFORMAL

- investigativas en el doctorado en Psicología: Ediciones Universidad Simón Bolívar; 2022.p.179-214.
5. Mathias K, Kermodé M, San Sebastian M, Davar B, Goicolea I. An asymmetric burden: Experiences of men and women as caregivers of people with psycho-social disabilities in rural North India. *Transcult Psychiatry*. 2018;56(1):76-102.
 6. García-Cantillo C, Reyes-Ruiz L, Sánchez-Villegas M. Abordaje de los cuidadores informales de discapacidad: una mirada desde el análisis documental de la normatividad colombiana. *Arch Ven Farmacol Terap*. 2021;40(5):550-561.
 7. Esquivel V. La pobreza de ingreso y tiempo en Buenos Aires, Argentina. Un ejercicio de medición de la pobreza para el diseño de políticas públicas. Programa de las Naciones Unidas para el Desarrollo. 2014. Disponible en: https://www.researchgate.net/publication/263449113_La_Pobreza_de_Ingreso_y_Tiempo_en_Buenos_Aires_Argentina_Un_ejercicio_de_medicion_de_la_pobreza_para_el_diseño_de_políticas_publicas
 8. ONU MUJERES. América Latina y el Caribe. Reconocer, redistribuir y reducir el trabajo de cuidados. Prácticas inspiradoras en América Latina y el Caribe. En: Sallé M, Molpeceres L; 2018. Disponible en: <https://lac.unwomen.org/es/digiteca/publicaciones/2018/11/estudio-reconocer-redistribuir-y-reducir-el-trabajo-de-cuidado>
 9. Organización Internacional del Trabajo OIT. Economía del Cuidado en Argentina. 2018. Disponible en: <https://www.ilo.org/buenosaires/programas-yproyectos/economia-del-cuidado/lang-es/index.htm>
 10. Repetto F, Bonari D, Díaz G. Recomendaciones para una nueva ley nacional de licencias por maternidad, paternidad y familiares. 2013. Documento de Políticas Públicas (126). CIPPEC.
 11. Ruiz-Robledillo N, Moya-Albiol L. El cuidado informal: una visión actual. *Revista de Motivación y Emoción*. 2012; (2): 22-30.
 12. Landínez-Parra N, Caicedo-Molina I, Lara-Díaz M, Luna-Torres L, Beltrán-Rojas J. Implementation of an education program for caregivers of dependent or disabled elderly. *Rev Fac Med*. 2015;63(3):75-82.
 13. Dueñas E, Martínez A, Morales B, Muñoz C, Viáfara A, Herrera J. Síndrome del cuidador de adultos mayores discapacitados y sus implicaciones psicosociales. *Colombia Médica*. 2006;37(2):31-38.
 14. Barrero Rodríguez FH. Cuidar a los cuidadores: las condiciones sociales del cuidado. Informe Final de Práctica Profesional. Ponencia en Universidad del Rosario. 2014. Disponible en: <https://repository.urosario.edu.co/handle/10336/10306>
 15. Wei-Chung E, Ying-Ying Tsai, Tsai-Wang C, Chao-Jung T. Quality of sleep and quality of life in caregivers of breast cancer patient. *Psycho-Oncol*. 2007;10(16):950-955.
 16. Oñate L, Calvete E. Una aproximación cualitativa a los factores de resiliencia en familiares de personas con discapacidad intelectual en España. *Psychosoc Interv*. 2017;26(2):93-101.
 17. Lazarus R, Folkman S. El concepto de afrontamiento en estrés y procesos cognitivos. Barcelona: Martínez Roca; 1984.
 18. Barrera-Ortíz L, Pinto-Afanador N, Sánchez-Herrera B. Evaluación de un programa para fortalecer a los cuidadores familiares de enfermos crónicos. *Rev Salud Públ*. 2006;8(2):141-152.
 19. Miranda K, Aravena V. Burden, social support and self-care in informal caregivers. *Cienc Enferm*. 2012;18(2):23-30.
 20. Salazar-Maya A, Cardozo García Y, Escobar, C. Carga de cuidado de los cuidadores familiares y nivel de dependencia de su familiar. *Investigación en Enfermería: Imagen y Desarrollo*. 2020;(22). DOI: <https://doi.org/10.11144/Javeriana.ie22.cccf>
 21. García-Cantillo C, Reyes-Ruiz L. Estrategias de afrontamiento de cuidadores informales de un hijo con diagnóstico de discapacidad en el Departamento del Atlántico. En: García Mathey L, Cerdan M, editores. *Tech-CAMP 2020 México: Ciudades Sustentables*; 2020.p.94-101.