The use of glasses for refractive disorder: a study from the perspective of an eye health

El uso de gafas para el trastorno refractivo: un estudio desde la perspectiva de una salud ocular

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Abstract

ABSTRACT. Currently, 2.2 billion people worldwide are experiencing vision impairment. At least 1 billion of them can be prevented by wearing proper glasses. Ironically, is it being difficult to distinguish between those who wear glasses due to refractive disorders and those who wear glasses to look fashionably trendy. This study aims to identify the behavior of eyewear users from the perspective of eye health based on sources from journals published in 2010-2020. The research methodology used is a systematic literature review by analyzing available literature relevant to the issue under study. Preliminary results show that the prevalence of refractive disorders is high and awareness of eye health needs is still low. There is a different attitude toward wearing glass between urban and rural consumers. Eye care services as a health system are needed to provide services and the importance of the proper use of glass as an aid for better vision and reduce the burden to vision due to refraction errors.

Keywords: user behavior, glasses, eye health needs, systematic literature review

Resumen

En la actualidad, 2.200 millones de personas en todo el mundo sufren problemas de visión. Al menos 1000 millones de ellos se pueden prevenir con el uso de anteojos adecuados. Irónicamente, es difícil distinguir entre quienes usan anteojos debido a trastornos refractivos y quienes usan anteojos para lucir a la moda. Este estudio tiene como objetivo identificar el comportamiento de los usuarios de gafas desde la perspectiva de la salud ocular a partir de fuentes de revistas publicadas en 2010-2020. La metodología de investigación utilizada es una revisión sistemática de la literatura mediante el análisis de la literatura disponible relevante para el tema en estudio. Los resultados preliminares muestran que la prevalencia de los trastornos refractivos es alta y que la conciencia de las necesidades de salud ocular aún es baja. Hay una actitud diferente hacia el uso de vidrio entre los consumidores urbanos y rurales. Los servicios de atención oftalmológica como sistema de salud son necesarios para brindar servicios y la importancia del uso adecuado de los vidrios como ayuda para una mejor visión y reducir la carga a la visión debido a los errores de refracción.

Palabras clave: comportamiento del usuario, anteojos, necesidades de salud ocular, revisión sistemática de la literatura.

Introduction

The eye is the organ for the *sense* of *sight*. It has the most dominant role that influences every aspect of life, in which it can absorb more than 80 percent of the visual information used to perform various activities. However, at the same time, many cases of vision disorders occur, ranging from mild to severe that can lead to blindness. This study aims to identify the behavior of eyewear users from the perspective of eye health based on sources from journals published in 2010-2020.

Literature review

At least 2.2 million individuals worldwide have visual impairments, with at least 1 million experiencing preventable or undertreated vision issues. According to 2014 World Health Organization (WHO) figures, there are 285 million individuals worldwide who have visual impairment, including 39 million who are blind and 246 million who have reduced vision (low vision). According to the WHO, uncorrected refractive diseases (URE) such as myopia, hypermetropia, and astigmatism account for 43% (123 million) of visual impairments[1].

When the shape of the eye prevents light from concentrating straight on the retina, refractive diseases, sometimes called refractive errors, occur. The eyes are unable to focus or refract light adequately onto the retina. Apart from inher-

ited reasons, refractive diseases are often induced by short-focus habits and excessive light exposure, which causes eye fatigue. Myopia, hyperopia, astigmatism, and presbyopia are the most frequent kinds of refractive impairment due to age-related causes. There is no such thing as a refractive disorder. However, if not handled promptly, it may become a serious condition. The refractive problem may interfere with everyday activities and potentially reduce the productivity and capability of human resources[2].

Usually, users will wear glasses to deal with these problems. It is considered as an option to correct refractive disorders. However, refractive abnormalities should be treated carefully to obtain the perfect balance and sharp vision. Glasses should be used regularly while studying and doing other activities, especially reading. If its usage is not routine or inadequate, users can suffer amblyopia, disruption to the learning process, disruption of vision function, and lower quality of life.

Laoviwat et al.[3] found that the most common cause of using glasses is myopia. While according to Contreras and Ackland[4], there are still many high myopia patients who do not wear glasses. Their study has been conducted in Nigeria. Prescription errors are often found among some sunglasses worn by individuals. In the majority of situations, it does not deliver the desired result in terms of correcting the user's refractive problem. This circumstance demonstrates the critical need for optical services in Nigeria to improve in terms of quality and capabilities. Various software programs used in the design drafting process need the development of specialized abilities[5,6].

Varma et al.[5] discovered that with increasing age, the frequency of uncorrected refractory illnesses and the definition of unmet refractory demands rose. Uncorrected refractive problems and unmet refractory requirements are prevalent among Latinos of Mexican ancestry.

Various studies have been conducted in Indonesia. The survey by Islami et al.[6] found a relationship between the level of knowledge of parents with the use of glasses as a corrective tool in children with refractive disorders. Parents who better understand refractive disorder tend to correct their child's vision by using glasses to avoid more severe conditions such as amblyopia, strabismus, and even permanent blindness. However, wearing glasses as a trend or fashion is also found to occur for better appearance, especially for women[7,8].

Currently, cases of wearing glasses that do not meet health standards are still prevalent in society. Previous studies by many researchers have found that people with refractory errors are unaware of the dangers of glasses that do not conform to health standards. Users still do not know and do not care whether the glasses used do not follow health standards, and the tendency to use glasses is not due to actual needs[7].

Method

This article was produced through the systematic literature review (SLR) method to identify the behavior of eyeglass users among those with refractive disorders. In this case, these articles will be selected based on specific themes, namely, refractive disorder problems and behavioral use of glasses for myopia. These articles are mostly available in full text online. Article search is limited to available articles in the English language that can be accessed from internet searches from databases, such as Proquest, Pubmed, and ScienceDirect, with keywords such as the use of glasses and refractive disorder or error. Articles that meet the entry criteria are collected and systematically reviewed. Search for literature published from 2011 to 2020. The search process finds articles that meet the criteria and those that do not meet will be excluded

Result

Based on the search results, it was found that many articles were considered suitable for research purposes, then they were put together and then displayed whether the titles in the article were the same or not. Once filtered, articles with the same title will be segregated. The entire article is then screened based on suitability for entry and exclusion criteria. This is the process conducted to allow an article to be selected for further review.

The literature search strategy can be seen in Table 1 as follows:

Table 1. Literature Search Strategies

Search Engine	Proquest	Pubmed	Sciencedirect
Search results	18.100	933	95
Full tex, Pdf, 2011-2020	367	365	20
Appropriate title	19	10	0
Same title			
Eligible according to inclusion criteria and exclusion	3	4	
Result	7		

The results of the further analysis found the results to meet the criteria that have been set, which consists of several studies conducted by several authors with interesting findings relevant to this study. There are seven articles in total that are closest and meet the set criteria. The further in-depth analysis found that one article was produced using quantitative research design and comparative analysis, five articles using quantitative research design with cross-sectional studies, and the remaining one article was produced using literature review analysis.

These seven articles were further analyzed to obtain the necessary information and data. The data extraction process was carried out by analyzing the data based on the title, objectives, research methods, and research results, which are the most critical data elements in these articles. The results of the data extraction can be seen in Table 2

No	Author / year	Title	Journal	Purpose	Method	Result
1.	Qian et al.[8]		Eye	To measure the amount and drivers of rural Chinese adolescents' unmet demand for glasses and their influence on health-related quality of life (HRQOL).	In 2016, in Southwestern China, a survey of 2346 grade-7 pupils (mean age: 13.8 years) was undertaken.	For need variables, we discovered that the prevalence of glasses use rose significantly with a lower uncorrected visual acuity). There was a tendency toward a positive link between spectacles use and self-reported myopia, but it was not statistically significant. In univariate analysis, the existence of glasses was associated with emotional health, social functioning, and school functioning scale scores (all P values were between 0.05 and 0.10)
2.	Nsubuga et al.[9]	Uncorrected refractive errors, presbyopia and spectacle coverage in Kamuli District, Uganda	African Vision and Eye Health	The purpose of this study was to determine the prevalence of uncorrected refractive error (URE), presbyopia, and spectacle coverage in Uganda's Kamuli area.	Rapid Assessment of Refractive Error (RARE) is a community-based cross-sectional research that use multistage cluster random sampling to assess refractive error.	There were 4.6 percent refractive defects and 5.96 percent spectacle coverage. 50.3 percent of the population had uncorrected presbyopia, whereas 0% had spectacle coverage. Thirty-three (or 1%) of respondents said that they were current spectacle users. One hundred fourteen persons (3.5%) had previously worn glasses; however, 50.9 percent ceased wearing spectacles a year before to the research due to damaged, scratched, or uncomfortable spectacles. The primary impediments to spectacle adoption were service accessibility and spectacle pricing.
3.	Morjaria et al.[10]	Compliance and Predictors of Spectacle Wear in Schoolchildren and Reasons for Non-Wear: A Review of the Literature	Ophthalmic Epidemiology	This review compiles research on schoolchildren's compliance with spectacle use, the variables that influence compliance, and the reasons for non-compliance.	Medline, Embase, Global Health, and the Cochrane Library were used to perform literature searches.	Evidence shows that higher levels of spectacle use are related with increased severity of uncorrected refractive error and poorer levels of uncorrected visual acuity. Addressing sociodemographic factors for noncompliance is challenging due to their context-specific nature. There is mixed evidence that children grow less agreeable with spectacle use as they mature. While quantitative statistics suggest that girls are more likely than boys to comply with eyeglass use, qualitative research reveals distinct problems experienced by females.
4	Malhotra et al.[11]	Use of spectacles for distance vision: coverage, unmet needs and barriers in a rural area of North India	BMC Ophthalmol	The study sought to ascertain the incidence of spectacle covering, unmet requirements, and related variables among people living in a rural community in northern India.	cross-sectional study	Currently, 7.5 percent of people wore spectacles. 33.3 percent of those in need had their spectacles covered. Unmet needs were identified in 10.8% of subjects. Unmet need was linked with age, gender, degree of education, and marital status in multivariable analysis. The lack of perceived necessity for refractive correction identified as the primary impediment to service adoption. Enhancing eye care services within health systems that include refractive treatments and glasses is critical for lowering the burden of uncorrected refractive errors.
5	Marmamula et al.[12]	Spectacles use in a rural population in the state of Telangana in South India	Indian J Ophthalmol	To determine the frequency and trends of spectacle usage among persons aged 40 years in Telangana, India.	cross-sectional study	The usage of glasses was substantially related with being older, female, having a higher degree of education, and dwelling in the Adilabad area. Bifocals were the most frequently used glasses (56.3 percent), while private eye clinics provided the majority of services (70.3 percent). 53.6 percent of the population was covered by eyewear.
6	Desalegn et al.[13]	Knowledge, attitude, practice and associated factors towards spectacles use among adults in Gondar town, northwest Ethiopia	BMC Ophthalmol	to investigate the adult population of Gondar town, northwest Ethiopia, on their knowledge, attitude, practice, and related variables with spectacle usage.	cross-sectional study	The adult populace of Gondar have sufficient knowledge and a receptive attitude toward spectacles. However, eyewear usage is not widely practiced. Eye care practitioners, in partnership with the University of Gondar and the Gondar municipal government, must place a premium on eye health education linked to glasses use.
7	Mashayo et al.[14]	Prevalence of refractive error, presbyopia and spectacle coverage in Kahama District, Tanzania: a rapid assessment of refractive error	Clin Exp Optom	to ascertain the prevalence of refractive error and presbyopia, spectacle coverage, and obstacles to refractive service adoption in Tanzanian adults aged 15 years and older.	cross-sectional community-based survey	The prevalence of refractive error was 7.5%, which was greatest in persons over the age of 40 and in students. Presbyopia was 46.5 percent prevalent. Despite the availability of services, refractive error coverage among eyeglass wearers remains low. The causes include a sense of being superfluous, being preoccupied with other health concerns, being less conscious of refractive faults, and being unable to afford the expense of spectacles.

Discussion

Based on the analysis of these articles, the author found that the behavior of wearing glasses for users with refraction errors is still low. Although the prevalence of refraction errors is relatively high, the use of glasses is still low in some countries, particularly in rural areas. The limited availability of eye health services has led to differences in the use of spectacles for people with refractory errors in rural and urban areas. Although services are available in some places, many people with refraction errors choose not to wear glasses. Some factors influencing the attitude of wearing glasses in refraction errors include; age, gender, education, knowledge, attitude, awareness, concern, cost, and availability of service capabilities.

Glasses are still the safest way to correct myopia. Correction is done by adding a lens (glass) in front of the eye to collect images or light near the center of the eye lens to focus it on the eye's retina better. Glasses work for people with eye disorders to increase or decrease the focus strength on the eye's lens. The power required to focus the image directly on the retina[15,16].

Myopia may be treated using eyeglasses in a cost-effective and safe manner. The need for glasses is defined as a VA that is not corrected from 20/40 or worse and may be improved by a correction to 20/40 or more in the eyes with better vision, as well as the presence of myopia -0.5 D or less, hyperopia + 2 D or more, or astigmatism 0.75 D or more at both locations. On the basis of spherical equivalent refraction (ball power + 1/2 cylinder force), the refractive error is computed[17-20].

The use of glasses in patients with myopia is a form of health behavior. The behavior of using these glasses is an individual response to the refraction error that they experience. The response is in the form of individuals coming for consultation and conducting examinations in health services such as optics, clinics, and eye hospitals that are considered and believed to help overcome eye refraction so that eyes function individually well. According to Green[21] , a person's health behavior is formed from 3 factors, namely predisposition factors (knowledge, attitudes, beliefs, values, gender, age, etc.), support factors (facilities or health facilities), and motivating factors (officer behavior, community figures, etc.).

Knowledge and attitude are essential domains in shaping one's actions, including whether or not a person uses glasses in overcoming the refractive disorders they suffer. Knowledge or cognitive is a significant domain forming one's behavior. Whereas, attitude represents a positive and negative assessment and involves one's emotional response to a social object. If the result is positive, one will tend to approach the item, and vice versa if that attitude is negative, they tend to distance themselves from the object. The better a person's knowledge and attitude towards a refractive disorder that suffers, the more it will encourage the individual to act with glasses in overcoming myopia in the eyes that impact individual productivity. However, this differs from the results of a study by Desalegn et al.[13], who showed that the adult population in the city of Gondar has knowledge and attitudes that support the glasses. However, the practice of wearing glasses is poor.

In addition to the factors of ignorance and dislike that come from internal individuals, social and cultural acceptance factors and others as external factors for people with refractive disorders choose to use glasses in their daily life. This statement is supported by the research results of Bond et al.[22], which state a positive relationship between the use of glasses and emotional health, social function, and function in school. Emotional health arises from wearing glasses due to discomfort and insecurity. The negative image of wearing glasses from the surrounding environment impacts the social function of eyewear users. This situation encourages people with refractive disorders to buy glasses that can make them comfortable and increase their self-confidence. The results of this research reinforce the statement by Achsan & Lubis[14], which found that emotional closeness has a positive and significant effect on optical consumer satisfaction in choosing and using glasses.

The research results by Omolase & Mahmoud[23] stated that consumers use glasses partly as protection, and some use them as a fashion. The use of glasses is a fashion for its users to know that the most important factors influencing the consumer behavior of optical products in buying glasses include fashion trends and eyeglass frames' design and brand[24].

Mireku & Ebenezer[25] also found that the use of glasses cause discomfort. Kobia-Acquah et al.[26] also found that the reason for not using glasses behavior is because of the assumption that the use of these glasses makes their eyes look small. Eye comfort is the fulfillment of a person's need to see more clearly and sharply, accompanied by feeling fresh, healthy, undisturbed, and able to carry out daily activities freely and without distraction. Eye comfort is not only related to physical and biological problems, but also feelings, such as unobstructed light entering the eye whereby no veil to cover the view, does not make the eyes sting / stinging, and so on. Comfort can be rated from the most comfortable to the most uncomfortable, based on the perceptions of each individual[27,28].

The use of spectacles is a way to address the requirement for eye correction while maintaining an individual's eyesight and quality of life. In the research, Malhotra et al.[11] discovered that 33.3 percent of individuals in need had coverage for eyeglasses. This scenario occurs as a result of the absence of a need for refraction and correction. Met needs were evaluated for individuals who used distance vision glasses and had vision acuity of less than 6/12 in their better eyes without correction, but attained 6/12 or more in their better eyes with their existing distance vision glasses. Unmet needs include those who do not use glasses, those with distant vision and improved vision less than 6/12, and those with subjective acceptance of better eye vision more than 6/12. This is consistent with the findings of Marmamula et al.[12], who found that age, education level, and gender were all related with the usage of glasses, particularly among the elderly.

According to Nsubuga et al.[9] , implementation will be impacted by the prevalence of uncorrected refractive errors (URE) and hurdles to acceptance of refractive error services. The scarcity of refractive error services and glasses contributes to

the difficulty of obtaining glasses to treat uncorrected refractive errors (URE). This will have an effect on the rate of URE prevalence.

Access to facilities that allow for the use of glasses in the user's home is another critical indication for primary care programs. This topic has received widespread attention, with estimates ranging from 21.1 percent in the Los Angeles Latinos Eye Study to 66 percent in Iran[29] and 40.5 percent in Bangladesh[17]. The growing usage of spectacles is a result of the region's expanded access and quality of refractory error services, indicating that an increasing number of individuals have a "need" for glasses. In other words, more patients have been treated who had major refractive problems.

In addition, compliance behavior in using glasses also impacts the recovery or maintaining eye health. The research by Morjaria et al.[10] showed that low levels of uncorrected refractive error and levels of uncorrected visual acuity were associated with higher compliance in the use of glasses. Overcoming socio-demographic reasons for non-compliance is complicated due to the specific context. Evidence that children become less obedient to the outfit glasses with age becomes inconsistent. Quantitative data shows that girls are more likely noncompliant with glasses than boys. The reason for non-compliance is often due to forgetting or goggles damaged or scratched. Compliance with the use of glasses is an important thing. It needs to be considered especially for school-age children because, according to previous studies, compliance with glasses can reduce the risk of increasing progression of myopia degrees, affecting their teaching and learning process.

Mashayo et al.[14] discovered that refractive disorder has a high prevalence of 7.5 percent and is most prevalent in individuals over 40 years old and among students, while the scope of glasses for refractive disorders and presbyopia is 1.69 percent and 1.69 percent, respectively. The data reveal that, despite the significant incidence of refractive problems, eyeglass coverage is poor. Individuals who have gotten an eyeglass prescription tend to have a reduced replacement rate. To ensure that glasses are replaced on time, they must be regarded a relevant activity that has a favorable effect on one's quality of life, work productivity, and other elements of life. As a result, there is a constant need to educate people about the advantages of wearing glasses and to raise their understanding of eye care. This is a problem for public health in the Kahama area, and efforts to provide sustainable services and promote health are necessary.

The findings show that the prevalence of myopia is high, but the level of use of glasses among the affected users is low. This situation still happens even though glasses are known to serve as a treatment for myopia or to maintain better vision. Every individual should be aware of the need that glasses are a valuable item for them to help overcome vision problems so that they can continue to be productive. Therefore, this individual must perform an eye examination. The expected result is that the individual involved will wear glasses according to the advice received from the expert who provided the prescription. This is consistent with a study by Luxottica[24] that 36 percent of people interviewed consider the recommendations given to by their optometrists and purchase various types of correction lenses based on their recommendations. Most respondents prefer to make a purchase decision only after being advised by an ophthalmologist, depending on their professional experience.

Visual disturbances such as uncorrected refractive errors are a serious public health issue in many countries, affecting many individuals despite their awareness of vision difficulties but lack of eye examination. This occurs as a result of the accessibility and cost of eye health care. Numerous studies have also shown a greater incidence of myopia in rural residents but much lower rates of eyewear coverage. There have been several instances when it was discovered that none of the participants with extreme myopia in rural areas used glasses[30-33]. As a result, eye care services should be considered essential health care. Local government policy should provide fair access to eye care services while emphasizing the necessity of good spectacle usage and the need to lessen the burden of vision caused by refraction mistakes. Without access to high-quality eye care and the availability of proper glasses, mild to moderate vision impairment may have a major impact on cognitive, social, economic, and individual wellbeing.

Conclusion

Although the prevalence of refractive disorders is high, the use of glasses is still low. Generally this condition can be attributed to a number of factors such as, individual awareness of the use of glasses to restore or maintain better vision. The availability of limited eye health services in rural areas is a factor that prevents people with refractive disorders from wearing glasses. The authorities and relevant parties in the country should pay serious attention to various reasons that cause individuals not to wear glassess. At the same time, healthcare workers, especially those in the eye health sector, need to actively share information and provide education to correct misconceptions about wearing glasses.

IMPLICATIONS

Through the formulation of policies on public health and the existing mechanisms, the government should play a proactive role to encourage changes in user behavior in wearing glasses to overcome problems related to refractive disorders. Among the measures that can be taken is health education-oriented activities to increase awareness and provide better eye care facilities, especially in rural areas. Private eye or optics clinics can also offer eye care services in rural areas while at the same time providing appropriate counseling for those with myopia as potential users to use glasses properly.

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