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Comprehensive education program for diabetes mellitus patients aimed at optimizing quality of life

Dr. Freddy Contreras

SUMMARY

Epidemiological data show that Diabetes Mellitus (DM) is becoming the epidemic of the 21st century. Numerous studies indicate that good control of DM requires a patient trained in knowledge related to the clinical condition he presents. This work describes a comprehensive education program for DM patients optimizing their quality of life, under the ontological assumption of the interpretation of thought, opinion, experience, and reality perceived by the patient himself. The study is framed in the interpretive paradigm under the phenomenological current, with an emerging, open, and flexible type design. The research was carried out at the Centro Médico Docente Los Altos, located in Miranda State, Venezuela, and key sources were patients with DM whit more than five years of evolution. An In-depth interview was used to collect the information and the budgets of Strauss and Corbin's Continuous Comparative Method were followed in its analysis. Our results indicate that five categories emerged: Manifestations of diabetes status, Emotional status, patient lifestyle, public health policies and education in diabetes and quality of life, which allowed designing a theoretical construct, in correspondence with the phenomenon studied. In conclusion, constant preparation through comprehensive education of DM patients, based on the empowerment of knowledge, skills, and self-management of their clinical condition and emotions is essential to optimize the quality of life.

Key words: *Comprehensive education, patients, type 2 diabetes mellitus, quality of life*.

RESUMEN

Los datos epidemiológicos muestran que la diabetes mellitus (DM) se está convirtiendo en la epidemia del siglo XXI. Numerosos estudios indican que un buen control de la DM requiere de un paciente entrenado en conocimientos relacionados con la condición clínica que presenta. Este trabajo describe un programa de educación integral para pacientes con DM optimizando su calidad de vida, bajo el supuesto ontológico de la interpretación del pensamiento, opinión, experiencia y realidad percibida por el propio paciente. El estudio se enmarca en el paradigma interpretativo bajo la corriente fenomenológica, con un diseño tipográfico emergente, abierto y flexible. La investigación se realizó en el Centro Médico Docente Los Altos, Estado Miranda, Venezuela, y las fuentes clave fueron pacientes con DM con más de cinco años de evolución. Se utilizó una entrevista en profundidad para recolectar la información y en su análisis se siguieron los presupuestos del Método Comparativo Continuo de Strauss y Corbin. De los resultados surgen cinco categorías: Manifestaciones del estado de diabetes, estado emocional, estilo de vida del paciente, políticas de salud pública y educación en diabetes y calidad de vida, que permitieron diseñar un constructo teórico, en correspondencia con el fenómeno estudiado. Se concluye que la preparación constante a través de la educación integral de los pacientes con DM, basada en el empoderamiento de conocimientos, habilidades, destrezas y autogestión de su condición clínica y emociones es fundamental para optimizar la calidad de vida.

Palabras clave: *Educación integral, pacientes, diabetes mellitus tipo 2, calidad de vida.*

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[1] Ph.D. Internist. Associated Professor of Physiopathology chair Department of Basic Sciences-EE. School of Medicine, Central University of Venezuela. Caracas – Venezuela. ORCID: https://org/0000-0003-3691-3461.

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INTRODUCTION

At an early-stage Diabetes Mellitus (DM) is asymptomatic, this being the reason for its late detection up to three years later or more, when classic symptoms of hyperglycemia develop, making medical care an urgent need (1). Sustained hyperglycemia (2) can precipitate the appearance of acute and chronic complications, affecting the quality of life of both the patient and their family, as well as shorten the patient's life expectancy (3).

The global outlook shows that, in recent years, there has been a significant increase in the incidence of DM, acquiring a dimension of a global epidemic. According to the report of the International Diabetes Federation (IDF) (4), 3 out of 4 people living with diabetes (352 million worldwide) are of active age; 111 million people over the age of 65, (1 in 5 people) suffer diabetes. There is evidence that Diabetes Mellitus Type 2 (DMT2) among children and adolescents is rising in some countries. Additionally, 1.1 million children under the age of 20 have type 1 diabetes.

According to Nieto-Martínez et al. (5), 13.1 % of Venezuelans over the age of 20 have diabetes, and prevalence has increased from 7.7 % in 2010 to 13.1 % in 2017. Besides, people at risk went from 22 % to 39.8 %, which generates a very high potential to continue increasing the prevalence in the country, a situation that can be aggravated because knowledge about the condition, complications, pharmacological treatment, nutritional treatment, exercise, metabolic control goals and lifestyle changes that are part of the bulk of their integral management are unknown by a very high number of patients and their family environment.

Not with standing the above data, in Venezuela, according to IDF (4), the age-adjusted comparative prevalence in adults aged 20 to 79 by 2019 was 7 % and the proportion of undiagnosed DM in the same age group was 51.8 %; that is, 1 in 15 adults aged 20 to 79 have undiagnosed DM.

Several clinical essays recorded in the literature, namely: Malmö Preventive Trial (6); The Da Qing IGT and diabetes study (7); Estudio de Prevención de Diabetes (DPS) (8); The Diabetes Prevention Program (DPP) (9) and DPP Research Group (10), have demonstrated that proper control of hyperglycemia and associated cardiovascular risk factors can prevent the development and progress of chronic complications, the leading causes of high rates of death and disability from diabetes, and high costs of care. Patient adherence is evaluated by biochemical indicators (HbA1c, basal blood glucose, postprandial blood glucose, total cholesterol, LDL, HDL, triglycerides) hemodynamic (blood pressure), and anthropometric indicators (BMI, waist/hip ratio, and skin folds).

Despite the advances in therapeutic (next-generation insulin analogs), medical technology (continuous insulin infusers and continuous glucose measurement), and new technologies for early diagnosis of the entity, an acceptable degree of metabolic control is not yet achieved in a significant proportion of patients.

Contreras et al. (11), Deakin et al. (12), and Norris et al. (13) have shown that diabetes education is the best way to improve psychosocial functioning and metabolic control of patients by inducing modification in biochemical, anthropometric indicators, and quality of life. Clement (14), Pimouguet et al. (15), and Qi et al. (16) demonstrated that HbA1c can be optimized through adherence to a structured education program for patients with DMT2.

In this regard, despite its proven effectiveness, the Diabetes Attitudes, Wishes and Needs second study (DAWN2) (17) showed that only 48.8 % of the participating subjects had participated in some diabetes education program. In addition, patients who have never received education about the disease are four times more at risk of complications attributable to the Kent et al. entity (18). Commendatore et al. (19) reported that in Latin America there have been very high numbers, up to 70 % of diabetic patients with inadequate metabolic control, findings that support the deficiency of education in diabetes. Current trends call for the patient to learn how to self-maintain their clinical condition; in this sense, the health care professional must lead the person with diabetes to their empowerment, encouraging their autonomy so that they can properly manage their clinical condition, Yoldi (20).

Therapeutic diabetes education (TDE), according to the World Health Organization (WHO) (21), is an integrated educational process for treatment, which seeks to provide people with DM and their families with the skills (knowledge, skills, and attitudes) and support needed to be able to take responsibility for the self-management of their condition. It is imperative that patients understand their clinical condition and the basis of treatment, and that they can integrate it into their daily lives, be able to prevent, recognize and act in acute risk situations and prevent vascular risk factors (22).

For this investigation, and in line with what is raised by the United Nations in the final document of the 1993 World Conference on Human Rights (23), comprehensive education is defined as training aimed "on the full flourishing of the person and towards the strengthening of human rights and fundamental freedoms. It is a comprehensive education capable of preparing self-employed and respectful subjects of the freedoms of others". That is, it must be included in the cognitive, emotional, and social sphere.

According to Medina-Vidaña et al. (24), learning must integrate knowledge (self-awareness, initiative, values, and collaborative work with others) with knowing (conceptualizing, interpreting, and arguing) and know-how (applying procedures and strategies), taking into account the specific challenges of the environment, personal growth needs, and uncertainty processes, in a spirit of challenge, suitability, and ethical commitment, in line with Delors' approaches (25).

Structured patient education is one that is provided through a planned and progressive program, which is consistent in the objectives, flexible in content, covering the needs in knowledge on diabetes, nutrition, therapeutics, and psychological aspects, adaptable to the level and cultural context of individuals and group of participants.

In the consideration of what is raised, it is essential to address fundamental deficiencies in knowledge, self-management, therapeutic, nutritional adherence, and complications of diabetes in patients and family members; as well as periodic evaluation of the results of innovative programs aimed at reorienting patient behaviors, strengthening national capacity to compile, analyze and use representative data on the burden and trends of DM and its risk factors. In addition, it is peremptory to develop, maintain, and strengthen a national program of education in diabetes that must be feasible and self-sustaining.

Based on the evidence above (11-20) that indicate that good control of DM requires a patient trained in knowledge related to the clinical condition he presents, coupled with the growing need to promote structured education in the Venezuelan population, it was investigated the perceptions of DM patients as to their clinical condition, their lifestyle, educational needs and appreciation of the quality of life, under the ontological assumption of the interpretation of thought, opinion, experience and reality perceived by the patient himself to design a proposal of a comprehensive educational program aimed at patients with DMT2.

METHODS

The research was conducted according to Hurtado et al. (26) interpretative paradigm that allows to "describe the meanings and interpret the words as best as possible, writings, gestures, and texts, as well as any act or work", as well as to investigate how people experience and interpret the social world they build in interaction with their situations, intentions, beliefs, motivations and what that object person interaction means to them. In addition, a phenomenological approach was assumed which seeks the "study of phenomena from the perspectives of the subjects, taking into account their reference framework" (27). Similarly, the study was planned as an emerging, flexible and open design both before and during the actual research process (28).

The research was carried out between September 2018 and February 2019, in the internal medicine consultation of the Centro Médico Docente Los Altos, located in the municipality Carrizal, Estado Miranda, Venezuela, in which key informants were selected (29).

Inclusion criteria were: adult patients with 5 or more years living with type 1 or type 2 diabetes status, who regularly attended specialized consultation and voluntary willingness and informed consent to participate in the study. The information was obtained through the technique of the in-depth interview, which revolved around the objectives designed in the study with an emphasis on educational perspectives and the quality of life of the patient, which would allow the design of an educational program.

The analysis of the information was carried out according to the parameters proposed by the informed theory of Glaser and Strauss (30) using the Strauss Continuous Comparative Method (MCC) (31) to obtain categories of analysis of the data (terms or clear, clear expressions issued by patients); this information was classified into significant sub-categories, categories or classes, depending on the relationships between the data collected (32). In this sense, during the material review, marginal notes, words, or expressions of meaning and descriptive power provided by the interviewees were made, which subsequently led to the constituting of the concepts or verbal contents of the experience (category). The steps that guided categorization were: (a) Transcribe primary or protocol information in detail; (b) Divide the contents into thematic units, and (c) Specify the central expressions or ideas of each unit.

The credibility, auditability, and transferability of the research were determined by subjecting its results to the discretion of participants and other researchers, in accordance with Guba and Lincoln's criteria (33). Similarly, the triangulation of the information was carried out for each station, between stages and with the theoretical framework (34,35). The triangulation between states allowed establishing comparison relationships between the responses provided by the actors interviewed (patients), that is, the relationships between the responses given by each subject to the different topics, thus comparing the opinions were given, which enriched the investigative scenario. In addition, triangulation with the theoretical framework was carried out based on the specialized literature on the subject addressed by crossing it with the results of the fieldwork and the opinion of the author.

RESULTS

The results obtained are the outcome of the application of interviews with 25 patients with DM and subsequent analysis and interpretation of the findings. Table 1 presents the general characteristics of the study participants, where it is shown that the female sex predominates in the participants, 52 % are professionals, 68 % of the interviewees have more than 10 years with the status of DM, and that 80 % have never participated in Diabetes Education programs.

Table 2 shows the perception of patients with diabetes status in terms of their clinical manifestations, lifestyle, and education in diabetes and quality of life, constituting primary information provided by key informants to build the educational program in diabetes.

Table 1

General characteristics of the participants in the study

FEATURES	CATEGORIES	N	%
Age groups	20-40 years old	04	16
	41-55 years old	10	40
	56-65 years old	08	32
	+ de 65 years old	03	12
Gender	Male	12	48
	Female	13	52
Educational level	Primary school	6	24
	High school	6	24
	Senior Technician	0	0
	University	13	52
Civil Status	Singles	12	48
	Married	13	52
Time in years with DM status	5-10 years	8	32
	+ 10 years	17	68
Participation in diabetes education programs	Yes	5	20
	No	20	80

Table 2

Categories, subcategories, and resulting properties that give origin to emerging theory

CATEGORIES	SUBCATEGORIES	PROPERTIES
Clinical manifestations of diabetes status	Symptoms of the condition	Cramps, tiredness Dry mouth, thirst Sleepiness Weightloss Ketoacidosis High blood glucose values Headaches Fainting
Patient lifestyle	Daily life	Life-changing Routine change Habit
	Social life	New Habits Social activities Discrimination Indiscretion
Diabetes education and quality of life	Need for education and information	Information and dissemination Ignorance Lack of guidance
	Self-management	Drug treatment application Nutrition Workout
	Beliefs of the CONDITION	Going blind Losing a limb Death in a dialysis machine
	Information empowerment	Verystrictschedules Acceptance of the condition Adapting and feeling good Goals and objectives Proper handling of information Valuing the benefits of diabetes education

DISCUSSION

Theorizing, according to Sandin (27), involves interpreting the data so that they can be conceptualized, concepts that are related as a theoretical representation of reality. This phase provided the theoretical constructs necessary for the design of the program in comprehensive education aimed at patients with DMT2 to optimize the quality of life in the Venezuelan social context.

The first category that arises from the research is the clinical manifestations of diabetes status. Individual perception of signs and symptoms are objective, clinically reliable manifestations and observed in medical examination, traditionally constitute the unequivocal signs that force the patient to seek help from health professionals; expressions such as “glucose were always elevated", "I lost a lot of weight... many headaches" "I fainted..., the need to urinate was very frequent and weight loss was noticeable. ..." "very dry mouth, leg cramps and I was tired as I walked short distances or climbing", "excessive thirst, increased appetite, extreme fatigue and irritability, blurred vision, recurrent infections on the skin, gums and urinary or vaginal tract, wounds that take time to heal, very dry skin and feeling tingling or numbing in limbs".

Patient lifestyle category: subcategories daily life and social life.

Daily life: Adapting to a non-communicable disease involves various changes in habits that interfere with the daily lives of individuals (36). The lifestyle according to the WHO "is the general way of life, which is based on the interaction between living conditions and individual patterns of conduct, which are determined by sociocultural factors and by the personal characteristics of individuals" (22), that is, as patterns of conduct that have been chosen from the alternatives available to people, according to their ability to choose their socio-economic circumstances.

For Romero-Márquez et al. (37), lifestyle is an important etiological agent of the disease and the appearance of complications that affect the quality of life of the patient; however, there are no studies that determine which facets and domains of quality of life are affected by the lifestyles of people with type 2 diabetes mellitus. With a less healthy lifestyle, you are more likely to acquire the disease, or if you have it, recovery will be difficult, and the possibility of greater complications. Lifestyle skills and behaviors have included behaviors and preferences related to the type of food, physical activity, alcohol use, tobacco or other drugs, health responsibility, recreational activities, interpersonal relationships, sexual practices, work activities, and consumption patterns.

Diabetes treatment requires changes in people's lifestyles for the rest of their lives. Living in a chronic condition can be very threatening, as it affects life as a whole, dramatically changing the daily routine of diabetic people and their relatives (36).

As the patients interviewed indicate, the new life they have to assume, "alters their daily life..." "completely changed the routine of my household" "... involved changes in my life routine..." Due to the characteristics of this condition, if the patient fails to change his lifestyle, the advances of his control will be few, consequently, complications will appear and the patient will probably feel frustrated and hopeless to be able to achieve some improvement in the short term. Clearly, the daily activities carried out by family members will be affected by the change in the affected patient, being limited from doing activities that were accustomed, including drastic changes in the feeding patterns.

Social Life: A person's social environment is made up of those around him in his day-to-day life, at work and/or studies, and in the community whether or not he has a direct relationship with them. Unfortunately, this environment has not been educated in Venezuela regarding the diabetic condition and what it entails. Within this perspective, the patient with the condition of diabetes is sometimes forced to perform his self-care in places outside the comfort of his home, which can provoke the indiscreet look of someone and even the flight of that person, resulting in feelings of rejection in the patient, as indicated by the informants... "It is uncomfortable to want to lead a social life when one is subjected to a strict diet..." "Inject yourself in public as the common people see you as a drug addict..." "We are discriminated against even in job interviews out of ignorance..." It is unfortunate to see how a patient with diabetes status can feel discriminated against because of ignorance of the social environment. In this way, they find it difficult to maintain the recommendations and self-care to which they must submit, thus decreasing their quality of life.

In the words of Baptist and Zambrano (38) "the quality of life in a sick person is the result of the interaction of the type of disease and its evolution, the personality of the patient, the degree of change that inevitably occurs in his life, the social support received and perceived and the stage of life in which the disease occurs". If there is no social support, social isolation can occur, although sometimes there can be the establishment of bonds of solidarity and support between friends, family, and others (36).

Category Education in diabetes and quality of life: subcategories Education Needs, Self-Management, Condition Beliefs, and Information Empowerment, considers:

Educational Needs: Diabetes education is vital to achieving and maintaining a person's health. However, achieving and maintaining the health of a being is a social demand, a demand that can be satisfied with health education, as Kant (39) points out "Man can only become a man by education. He is merely what education makes of him. In education it´s the great secret of the improvement of human nature", and hence health.

In teaching the patient with DM, also, to inform, the assessment of their needs is required, to provide individualized teaching, in addition to quality and sufficient content, and feedback of what is taught.

The needs of individual and group education arise from the limited information that exists in this regard in the Venezuelan context. It is evident in some informants: "... my education regarding the disease was very poor... I lacked more guidance at this time..." "We don't even know what a glucometer is for..." "They don't know where the pancreas is..."

Similarly, it was perceived that teaching patients has been relegated to a specific activity carried out in spaces and in times not allocated for it; although the information is necessary, it is not enough; education can only be talked about when a positive change has been made for health; education for this purpose is teaching-learning, so it involves those who teach it and those who receive it.

The need to train expert professionals who can work as referents or case managers in support of the self-care-empowerment process of people with DM, in specialized adult or pediatric diabetes units, individually or in groups and always with a structured program, in primary health care centers is a viable option to promote comprehensive education in diabetes (11). In this sense, educational programs require health care providers: specific training, teaching, communication skills; as well as the willingness to dialogue to listen, understand, provide support, attitude, and negotiate with the patient.

According to IDF (4), Nieto-Martínez, et al. (5), and WHO (40), in Venezuela, new cases of diabetes are recorded, which fully justifies the design and implementation of educational programs in TDE, aimed at health professionals, aimed at transferring competencies to the patient, a complex task for which health professionals must be trained with a specific methodology.

Therapeutic education from the perspective of teamwork of different health professionals becomes an efficiency factor, and therefore requires a change in the orientation of work: to stop treating only the disease and promote education and promotion for health; difficult work, more not impossible. Therefore, it is necessary to generate health professionals an agent of change, and perhaps this will transform Venezuelan public health outcomes.

Self-management: It is defined as the daily attention, by the people themselves, in the course of chronic diseases (41). Although it is a term often used as a synonym for self-care, self-management has evolved to simply be the practice of providing information and increasing people's knowledge (42). However, these concepts are interrelated; self-management is considered by many authors (43-45) as those tasks that healthy people perform at home to prevent disease, rather than just caring for an existing disease.

"One of the most enjoyable experiences of my diabetes is that it has allowed me to learn..."; "...I knew that he exercised is exceptional..."; "...I'm very good at handling the glucometer..."; "... learn about eating, sleep, physical activity...."

Diabetes self-management includes the following topics: how and when to monitor blood glucose; insulin self-management skills; know oral medicines; nutrition counseling, including carbohydrates counting and heart-healthy eating; recommendations on exercise and stress management; prevention of long-term complications, foot care, and behavioral disturbances.

Beliefs of the condition: In popular culture, there are myths and beliefs about the existence of natural products to decrease blood glucose and thereby "control" and even "cure diabetes". These myths and beliefs originate in people due to the direct influence of the family, their local or regional culture, and their traditions or customs and customs so ingrained in the Venezuelan population. There is widespread use of herbs, stems, leaves or roots, flowers, some preparations of crushed or liquefied vegetables, raw or infusion, etc. Rajme (46) points out that there are popular beliefs such as that diabetes is contagious. It is not uncommon to read in newspapers and magazines, advertisements on the streets, popular markets, and even formal shops and other written media outlets, which issue remedies and announce "miracle products" that claim to have the cure or control for diabetes. The acquisition of these products by the population depends on many factors (economic, cultural, educational, to name a few), in addition to myths, beliefs, perceptions, barriers, as well as misconceptions related to diabetes mellitus (47).

There are also unfounded beliefs regarding the treatment of diabetes with insulin. Testimonies expressing nefarious attributes or consequences from insulin exposure are common. "... They were just talking about how terrible it was to have to apply insulin..." "... People go blind, lose their legs or die after having to apply insulin... I decided to leave everything..."; ".... we have everything against us..."; "... he couldn't do many things that he had to keep working schedules and very strict meals, not to use insulin because of his complications..."

Rajme (46) defines the myth as "the set of idealized or distorted beliefs and images about characters or phenomena that are present in various elements of people's daily lives", including in diseases such as diabetes; the myth also produces false expectations as it originates from magical thinking.

The disease goes beyond purely physical or biological aspects; there are social and psychological aspects that must be considered. In this sense, a person's beliefs are the main determinants of health behavior. Educating to transform the patient and influence adherent and favorable behaviors, displacing barriers, myths, and beliefs without a scientific basis to optimize metabolic control goals is a requirement for diabetes educators.

Information empowerment: When a patient expresses "... Once I accepted the condition, and was informed about what I had to do, I set challenges..."; "... I became aware of my diabetic status and that helps me a lot..."; you can say that you are empowering your condition and therefore will have a higher chance of success in the course of your illness.

To get the patient aware and value their condition and how to carry out their self-management, to improve their quality of life, through active participation in decision-making, and to feel increasingly involved in the process (self-responsibility) to achieve the therapeutic goals for the benefit of their own and their family group, are objectives of the empowerment in diabetes, a construct closely linked to human self-efficacy and motivation, which are regulated by thought.

Patient empowerment, self-efficacy, and the self-management model of diabetes are the cornerstone for sustaining and inducing the changes required in risk factors, emotional status, styles, and quality of life as strategies to optimize metabolic control goals and achieve a better quality of life in patients with the clinical condition of diabetes: "... I warn you of the negative consequences of diabetes and high glycemia..."; "... I feel much more empowered than my diabetes... with the resources to continue to control me..."; "... I became aware of my diabetic status and that helps me a lot..."; "... gradually teaches how to improve the lifestyle..."; "... you get the tools you need to have good control..."

Self-efficacy is a person's perception (expectation) of his or her ability and ability to control his or her behavior and environment, to achieve a desired goal or outcome (48,49). Social cognitive theory (48) considers self-efficacy for self-care for health to be one of the factors that determine people's lifestyles and therefore health. Expectations of self-efficacy can influence both feelings and thoughts and actions aimed at modifying positive or negative feelings, motivating cognitions of action, and more challenging actions.

Achieving adherence to treatment in a patient is a complex task due to the influence of personal factors such as perceived self-efficacy to address the doctor's instructions and the influence of the environment and social environment. DM is a clinical entity in which decisions that most affect metabolic control and patient well-being are executed by the patients themselves. Many of these decisions involve everyday activities of daily life (e.g. diet, physical activity, or therapeutic adherence). Collaborative diabetes care requires a new empowerment paradigm that allows a redefinition of the relationship between health professionals, patients, and their families to optimize the quality of life.

CONCLUSIONS

The interpretation of the perceptions of DM patients as to their clinical condition indicates that: a) each interviewee assesses their condition according to the situation they are going through. b) Patients perceive the condition as a barrier to joining their routine and work activities, referred to as their information and education have little capacity and ability to properly manage the clinical entity. c) The data provided by the informants underline the limited information, accessibility, and availability to participate in diabetes education in Venezuela's current context both in public and private schools. d) Patients perceive that being educated is an effective strategy to routinely live their condition and minimize complications that might arise, positively influence their goals, and self-promote their condition. e) The category of *Educational needs* and quality of life arising from interviews with patients with DM is a true reflection of the need to generate *quality of life* from an educational intervention.

Based on the above findings, the following needs are posed to be met in a comprehensive diabetes education program:

- Patients with DM, their family group, and health caregivers need to be informed and educated comprehensively about their clinical condition to safely self-maintain and ensure therapeutic adherence. The patient must "learn to live with the condition of Diabetes Mellitus" through diabetological education and for this is necessary the supports of health professionals, family members, and caregivers, and social institutions. In this sense, educational interventions are a valuable example of the multidisciplinary work of professionals of different trends who with knowledge, skills, and skills and empathetic communication can generate the introspection of patients.
- Diabetes educators should be trained in pedagogy and andragogy, therapeutic communication, psycho and neuroeducation that help to take advantage of the attitudes of the patient and his family group regarding their condition and hence their health and quality of life.
- Educational intervention in patients can not only influence metabolic control and minimize acute and chronic complications, its greatest significance rests on strongly influencing the promotion of psychosocial aspects such as quality of life in patients with diabetes, which should be acceptable and pleasurable for the patient and his family environment further objectives of diabetological education.
- Comprehensive diabetes education should use as cornerstones the self-management subcategories, beliefs of the condition, and the empowerment of information with the firm purpose of influencing the quality of life of patients and their family environment.

COMPREHENSIVE DIABETES EDUCATION PROGRAM

Description

The comprehensive education proposal for patients with diabetes mellitus has been organized to be applied to groups of patients (maximum 10 patients-group education) with the clinical condition of diabetes in their various clinical forms (DMT1, DMT2, DMG) and their microenvironment (wife, husband, children, parents, and caregivers), as they are the main actors and play a very important role to help in the educational activities, as they are responsible for observing, analyzing and projecting the results of that act.

Inclusion Criteria in Group Education

- Sufficient learning arrangement
- Poor metabolic control (Hba1c > 7 %).
- Debut in diabetes or onset of insulin therapy after individual education.

- Need for motivation and reinforcement of individual education.
- Informed consent and commitment of assistance.
- Not having received a group education in the previous 2 years.

Depending on the particular needs detected in each patient, it may be referred to as individual education. Each group work session can last 2 hours every fortnight for a total of 40 hours in six consecutive months. Any patient will benefit from the training plan regardless of their educational or socioeconomic level; however, they must sign a letter commitment of adherence to all sessions of the program.

Individual education by adapting to the particular characteristics of the patient can be very effective. What should be learned and how it should be learned is something that varies from person to person.

As for health professionals acting as educators, nurse, nutritionist, psychologist, podiatrist, and a doctor should be included, all with training in diabetes education. A coordinator should be assigned to oversee the planning, implementation, and evaluation of diabetes education. It is also proposed to implement a plan with personalized follow-up between the instructor-coordinator and the participant(s). Long-term participant's outcomes and goals should be communicated to the appropriate treating physician. Diabetes training would be provided by an educator prepared in diabetes education and management, with ongoing training in the area. An individualized education plan should be developed between the instructor and each participant, to lead the selection of interventions and strategies more appropriate for individual cases.

The topics included respond to the needs identified in patient interviews and thus to the categories arising from research analyses. These can be summarized in seven behaviors of self-management or patient self-care in accordance with the recommendations of the American Diabetes Association: 1. Eating Healthily; 2. Doing physical activity; 3. Monitoring my values; 4. Taking my medicines; 5. Finding solutions; 6. Reducing my risks; 7. Adapting healthily.

Comprehensive Educational Program Proposal Goals

In short term:

Increase knowledge, develop the skills and skills needed to achieve in the patient with diabetes: Establishing eating patterns appropriate to particular needs; the practice of physical exercises; the correct realization of the techniques of self-control of blood glucose and the daily care of lower limbs; Optimize your metabolic control and therapeutic adhesion.

In long term:

- Contribute to improving the patient's quality of life by reducing body overweight or obesity; Optimize metabolic control goals; Systematic practice of physical activity; Decreased acute and chronic complications; Decreased feelings of disability.
- Contribute to the reduction of the burden of clinical care by reducing hospital admissions; Decreased daily dose of medications; Better use of programmed services in diabetes dispensing; Encourage self-management and therapeutic and educational adherence to optimize control goals in patients with the clinical condition.

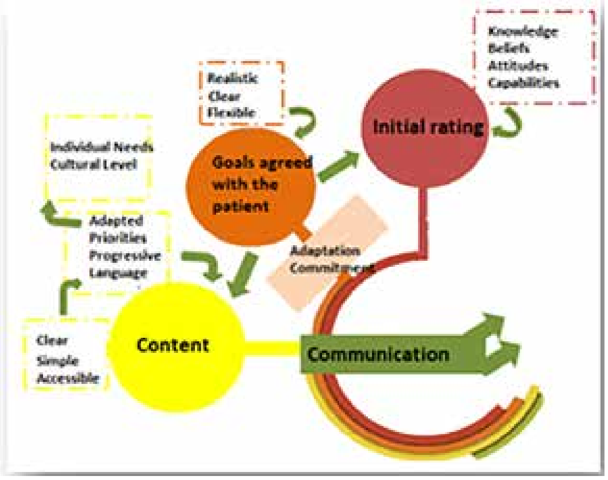

Figure 1. Communication. Contreras, 2019.

Key points of an Educational Program in Type 2 Diabetes

The objectives should be realistic, clear, flexible, and achievable, personally agreed with each patient, accepting the degree of commitment that is being prepared to assume, preferably by a written document. In this sense, it is key to assess the knowledge, beliefs, attitudes, and capacity of the patient, before the start of his educational program.

Communication is the basis of the educational process; it must be bidirectional, emphasizing nonverbal communication and establishing a relationship of empathy that is the basis of motivation for change. The language must be clear, adapted to the cultural level of the patient. It is important to deliver educational support material and provide contact web addresses and information (Figure 2).

The contents must be adapted to the needs and treatment of each patient and should be delivered progressively, prioritizing the most relevant aspects on which intervention is required in the first place.

Overall Program Objective

Contribute to the optimization of the quality of life of the diabetic person, in his family and social environment, through the promotion of self-responsibility, decision-making, and self-management of his clinical condition, through empowerment, self-efficacy, and therapeutic education in diabetes. Specific objectives and contents are described in Table 3.

Learning Strategies: Teaching strategies of learning instruction, represent the set of actions and procedures, through the use of methods, techniques, means, and resources that the employment program to plan, apply and evaluate voluntarily to effectively achieve the process in a specific teaching and learning situation, according to the pedagogical model (50). The type of didactics to select safe mainly from the knowledge that is proposed to teach in curriculum design, the behavior of the speakers, the management of teachers, and the personal characteristics of the groups of participants. The main teaching strategies used in diabetes education in group meetings are shown in Figure 2.

Figure 2. Teaching strategies.

Comprehensive Training Program Assessment

Impact Assessment (average number of days decompensated from patients and the number of hospitalizations per person with diabetes for 12 months) coupled with the skills learned by the participant; the evaluation will be given by the active participation and motivation of each patient. Objectives will also be considered achieved when the patient demonstrates attitudes, adherence, quality of life, and self-management achieved with biochemical parameters (HbA1c, lipid profile) optimizing blood pressure values.

Outcomes

The educational entity should measure the level of scope of the goals defined by the participant and the individual outcomes at regular intervals using appropriate instruments and techniques. The main outcome is self-driving behavior. The knowledge of diabetes, adherence to metabolic control goals translated into actions of self-management.

Table 3

Objectives and content proposed for a Comprehensive Diabetes Education program

OBJECTIVES	CONTENT
Recognizes what diabetes is, its clinical manifestations, and forms of presentation.	Diabetes, its clinical manifestations, and forms of presentation.
Set metabolic control goals for diabetes.	Metabolic control goals in diabetes: blood glucose, lipemia, arterial pressure, weight.
It identifies the economic and social impact of DM on the patient and their environment.	Economic and social impact of DM on the patient and their environment. Treatment costs.
Describes lifestyles and risk factors in diabetes and their relationship to quality of life.	Lifestyles and risk factors in diabetes. Quality of life in DM.
It identifies the importance of managing emotions and psychosocial factors in diabetes control.	Emotion, its influence on health and disease. Psychosocial factors in the genesis, development, and evolution of DM.
It resolves patient concerns that keep you away from distorted popular interpretations.	Coping in the management of protection and risk factors. Myths and realities in diabetes. Social support and social media management.
Understand and apply self-management as a DM patient care strategy.	Self-management as a DM patient care strategy.
It understands and applies self-monitoring as a metabolic control strategy in DM.	Self-monitoring as a metabolic control strategy in DM. Glucometry.
Identify the ideal feeding plan to optimize blood glucose values and adequate weight.	Feeding plan to optimize blood glucose and weight values. Myths and realities about food. List of exchanges, carbohydrate count.
Recognizes the importance of physical activity in blood glucose control.	Importance of physical activity in blood glucose control. Exercise indications-contraindications
It includes pharmacological treatment (oral agents and insulin) and its importance for diabetes control.	Pharmacological treatment (oral agents and insulin) and its importance for diabetes control. Myths about treatment.
Identify the conservation, preparation, and correct administration of insulin.	Conservation, preparation, and correct administration of insulin. Insulinization schemes, myths, and realities regarding insulin.
Reduces outcomes by preventing, detecting, and treating acute complications and chronic complications.	Outcomes; prevention, detection, and treatment of acute complications and chronic complications.
Learn about the care and prevention of foot injuries.	Foot care. Self-injury prevention. Hygiene and daily care. Suitable footwear and socks. Consult any changes.
Learn about oral hygiene care and prevention.	Hygiene and mouth care recommendations.
Identifies the importance of vaccines in preventing complications.	Vaccines in the prevention of complications.
Recognizes the importance of social and family support to optimize the quality of life and control goals.	Adherence to the patient's comprehensive treatment. Social support.
Learn about the management of pre-gestational and gestational contraception, pregnancy, and diabetes.	Management of contraception, pregnancy, and pre-gestational and gestational diabetes.
It encourages the better use of health systems and community resources.	CAREM program
Guide the handling of DM in special situations.	Provision of medicines. Provision of health centers.

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