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Original article

Influence of educational actions on self-care among people with diabetes in Primary Health Care*

Influência das ações educativas no autocuidado de pessoas com diabetes na Atenção Primária à Saúde

Influencia de las acciones educativas en el autocuidado de las personas con diabetes en la Atención Primaria de Salud

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Abstract

Objective: investigate the influence of educational actions supported by educational technologies on self-care among diabetic users in Primary Health Care. **Method:** participatory action research with 84 participants from a Family Health Unit in Recife, Pernambuco, between March and May 2024. Data collection was carried out using the Electronic Citizen Record (PEC), semi-structured individual interviews, and educational interventions, with content analysis based on the concept of self-care. **Results:** an initial lack of knowledge about the disease, nutrition, and self-care was observed, followed by significant progress after the interventions. There was an improvement in understanding the pathology, appreciation of a balanced diet, and recognition of self-care as a continuous and expanded practice. **Conclusion:** educational activities mediated by educational technologies were effective in promoting self-care and empowerment among people with diabetes, demonstrating the influence of these activities on changing participants' perceptions and increasing their shared responsibility for their treatment.
Descriptors: Health Education; Diabetes Mellitus; Educational Technology; Self Care; Primary Health Care

Resumo

Objetivo: investigar a influência das ações educativas com apoio de tecnologias educacionais no autocuidado dos usuários diabéticos na Atenção Primária à Saúde. **Método:** pesquisa-ação participativa com 84 participantes de uma Unidade de Saúde da Família de Recife, Pernambuco, entre março e maio de 2024. A coleta de dados ocorreu por meio do Prontuário Eletrônico do Cidadão (PEC), entrevistas individuais semiestruturadas e intervenções educativas, com análise de conteúdo fundamentada no conceito de autocuidado. **Resultados:** observou-se déficit inicial de conhecimento sobre a doença, alimentação e autocuidado, seguido de avanço significativo

após as intervenções. Houve melhora na compreensão da patologia, valorização de uma alimentação equilibrada e reconhecimento do autocuidado como prática contínua e ampliada. **Conclusão:** as ações educativas mediadas por tecnologias educacionais foram eficazes para promover o autocuidado e o empoderamento das pessoas com diabetes, demonstrando a influência dessas ações na mudança de percepção dos participantes e maior corresponsabilização pelo seu tratamento.
Descritores: Educação em Saúde; Diabetes Mellitus; Tecnologia Educacional; Autocuidado; Atenção Primária à Saúde

Resumen

Objetivo: investigar la influencia de las acciones educativas con el apoyo de tecnologías educativas en el autocuidado de los usuarios diabéticos en la Atención Primaria de Salud. **Método:** investigación-acción participativa con 84 participantes de una Unidad de Salud Familiar de Recife, Pernambuco, entre marzo y mayo de 2024. La recopilación de datos se realizó mediante el Prontuário Eletrônico do Cidadão (PEC, Expediente electrónico del ciudadano), entrevistas individuales semiestructuradas e intervenciones educativas, con un análisis de contenido basado en el concepto de autocuidado. **Resultados:** Se observó un déficit inicial de conocimientos sobre la enfermedad, la alimentación y el autocuidado, seguido de un avance significativo tras las intervenciones. Se observó una mejora en la comprensión de la patología, la valoración de una alimentación equilibrada y el reconocimiento del autocuidado como una práctica continua y ampliada. **Conclusión:** las acciones educativas mediadas por tecnologías educativas fueron eficaces para promover el autocuidado y el empoderamiento de las personas con diabetes, lo que demuestra la influencia de estas acciones en el cambio de percepción de los participantes y una mayor corresponsabilidad en su tratamiento.
Descriptores: Educación en Salud; Diabetes Mellitus; Tecnología Educacional; Autocuidado; Atención Primaria de Salud

Introduction

Diabetes mellitus (DM) represents a challenge for global public health. In 2021, it was estimated that more than half a million adults had been diagnosed with diabetes, with a projected increase of 12.2% by 2045, highlighting its growing impact on global morbidity and mortality.[1] This trend is reflected in the Brazilian context, where chronic noncommunicable diseases (CNCDs) remain one of the leading causes of death and disability, with DM being one of the most prevalent, characterized by hyperglycemia resulting from insulin deficiency or malabsorption, with no defined etiology and constituting a risk factor for the development of various complications and health problems.[2]

Given this scenario, Primary Health Care (PHC) plays a fundamental role in tackling NCDs, as it is the population's main point of access to health services, through continuous monitoring, early identification, and control of complications. Proper

management of diabetes in PHC is a priority, since monitoring and early identification reduce morbidity and mortality, lower costs for the Unified Health System (SUS), and promote a better quality of life. In this context, therapeutic adherence, access to appropriate treatment, and educational activities are essential for effective care.[3]

Thus, health education is characterized as a central strategy for bringing people with diabetes closer to the interdisciplinary team and strengthening their bond with health services. Educational actions enable the sharing of knowledge, the exchange of experiences, and the development of self-management practices and co-responsibility of users for their treatment.[4]

Self-care is essential for individualized treatment in diabetes, as defined by Orem's Self-Care Theory[5] (1971) as habits adopted by the individual to achieve well-being and quality of life, involving the sum of care—individual and nursing — in which nursing acts to promote people's autonomy, encouraging education and training of the population, which can be developed through educational actions aimed at the community. The present study adopts this reference to understand self-care in diabetes as a dynamic and shared process.

There are collections[6-8] on the use of educational actions to promote health and prevent diseases and conditions in the development of self-care in diabetes in scientific databases. However, most analyze this topic from the perspective of health professionals, looking “at” the patient, describing behaviors, validating tools, and leveling knowledge.

Thus, this study differs by adopting a qualitative and participatory approach, incorporating the engagement of the participants themselves and the use of educational technologies as tools for strengthening self-care. This strategy made it possible to understand the educational process as a two-way street, in which knowledge is constructed collectively and focused on the sociocultural reality of the participants. The research is relevant to nursing and PHC because it contributes to a new care paradigm—centered on co-responsibility, active listening, and valuing the user's experience as the protagonist of their care process.

Thus, the study aimed to investigate the influence of educational actions supported by educational technologies on the self-care of diabetic users in Primary Health Care.

Method

This is a qualitative study of the participatory action research type. Qualitative studies aim to understand certain phenomena in nature without using statistical instruments, but rather by studying individuals, people, their life experiences, cultures, and social roles. It is often used in studies of history, relationships, beliefs, and everyday life.[9]

To analyze the influence of educational actions on self-care, we used the participatory action research approach, created by Kurt Lewin in 1946, which seeks to transform reality, with the participation of subjects being essential for changing perceptions and behavior.[10] The study followed the Consolidated Criteria for Reporting Qualitative Research (COREQ) guidelines, ensuring that all stages of the study were described with clarity, quality, credibility, and transparency.[11]

The research was conducted at the Vila União Family Health Unit in Recife, Pernambuco. The unit has four Family Health teams, each consisting of a doctor, a nurse, a nursing technician, and five to six community health workers, and two Oral Health teams, each consisting of a dentist, a technician, and an oral health assistant. The unit covers a population of approximately 15,746 inhabitants, according to information from the Electronic Citizen Record (PEC).

The study population consisted of individuals diagnosed with diabetes mellitus, aged over 18 years, registered with the health center. Individuals who attended the unit during the data collection period and agreed to participate voluntarily were included. Those who did not attend the basic unit and users with cognitive or mental limitations that prevented them from participating in the interview or educational activities were excluded.

To ensure data reliability and enrich the analysis, data triangulation was used, combining different sources and collection instruments, using pre-existing records (PEC), semi-structured interviews, participant observation, and document analysis.

As shown below in Table 1, the variables investigated were analyzed using different instruments and categories of analysis.

Table 1 – Variables studied, categories, and data collection instruments, Brazil, 2024

Variables Studied	Categories	Collection Instruments
Sociodemographic characteristics	Gender, age, education, occupation, children, living arrangements, family history, risk factors, complications, type of diabetes, time since diagnosis, treatment, and physical parameters (BMI, waist circumference, and capillary blood glucose).	Interview (closed questions).
Basic knowledge about healthy habits related to self-care (pre-existing)	I. Healthy eating as a form of care; II. Physical activity as a form of care; III. Influence of emotional factors on diabetes; IV. Understanding self-care in diabetes.	Interview (open-ended questions) Bardin's Content Analysis.
Analysis of the influence of interventions on participants' self-care	Level of knowledge and self-care practices before and after the intervention.	Application of pre-test and post-test during educational activities.

Data collection took place between March and May 2024. Participants were recruited using information from the unit's PEC, and a survey was conducted of the population diagnosed with diabetes who were over 18 years of age, equivalent to 805 citizens. In this population, an active search was conducted for 39 citizens with diabetes who were registered and who attended during the hyperdia moments, in the period allocated for data collection in the schedule, to conduct the interview. This sampling was defined by theoretical saturation criteria, due to repetitive reports without significant new information.

It should be noted that all participants in this study signed an Informed Consent Form (ICF), understanding the purpose of the study and confirming their participation.

An interview script with semi-structured questions was used, and the interviews were recorded and subsequently transcribed. The script was developed by the authors,

based on the Brazilian Diabetes Society (SBD) e-book – Nursing consultation in the follow-up of people with DM.[12] Based on the information collected, three interventions were planned, lasting approximately 30 to 40 minutes, with pre-tests and post-tests being carried out as an evaluation strategy.

Thirty-nine diabetics participated in the interview; however, when invited to participate in the interventions on a day without conventional activities at the unit, there was low adherence, with only two diabetics present, due to the habit of scheduling on the day designated for Hiperdia. Given this, the interventions were reorganized to take place during Hiperdia, previously scheduled by the Family Health Strategy teams, which enabled greater participation. The educational activities were carried out with groups of 15 participants per week for three consecutive weeks, totaling 45 participants. It should be noted that there was no repetition between the groups, with different participants in the interviews and interventions, totaling 84 users involved in the research (39 interviewees and 45 participants in the educational activities).

The interventions took place on the day designated for Hiperdia (a day for registering and monitoring patients with hypertension and/or DM treated at the unit), prior to consultations with health professionals. The interventions were designed taking into account the socioeconomic variables of the participants, particularly the low level of education of the target audience, which led to more playful interventions.

Three educational interventions were carried out over three consecutive weeks with groups of 15 participants each. The topics were defined based on suggestions from users gathered during the pre-intervention called “Survey of topics for developing educational actions,” together with Bardin's content analysis, which determined the population's needs and requirements through their active participation in expressing their interests and questions about their condition. Thus, the topics covered were: “What is diabetes?”, “What is an adequate diet for a person with diabetes?” and “What is self-care and the risks of uncontrolled diabetes?”.

These sessions followed a standard structure: presentation/reception, pre-test to identify the target population's prior knowledge, and intervention. These interventions were carried out using different educational technologies, including games, discussion groups, serial albums, and group dynamics, depending on the suitability of the topic.

They ended with a post-test to identify the influence of the educational action on the diabetics' knowledge, through participants' reports on how they would change their personal care.

The pre- and post-test consisted of a guiding question related to the intervention topic, aimed at assessing the knowledge applied by participants before and after the activity. It should be noted that these instruments did not undergo a formal validation process and were exploratory and formative in nature.

To perform the data analysis, the Content Analysis[13] method was used, along with the participatory action research method associated with the theory of self-care.[5] During the exploration phase, these data were coded by analyzing responses to open-ended questions, which were grouped by classification, observing the frequency of occurrence and creating categories. Microsoft Excel software was used as a support tool for organizing, tabulating, and systematizing the data, facilitating the construction of categories and visualization of patterns.

According to Self-Care Theory[5], nursing needs to encourage autonomy and self-care among users, which is essential for promoting health and maintaining well-being. This concept is consistent with the objective of action research, which aims at a participatory approach by users, enabling a deeper understanding of the context, even though its results do not allow for broad generalizations, due to the situated approach and the particularities of the context analyzed.

This study originated from the Institutional Program for Scientific Initiation Scholarships - PIBIC/CNPq/UFPE 2023/2024. The research was approved by the Health Sciences Center Research Ethics Committee under opinion No. 6,663,800, on February 22, 2024, and complies with the ethical precepts set forth in resolutions No. 466/2012, 510/2016, and 580/2018. To ensure the anonymity of the participants, the interviewees were coded as PS29 and PS30, for example.

Results

A total of 805 diabetics were identified and distributed among the four teams. Eighty-four (10.43%) people with diabetes participated in this study, selected for convenience, corresponding to users who attended the unit during the data collection

period, specifically on the days designated for Hiperdia. Of the 84 participants, 39 participated in the interview and 45 in the interventions, with no overlap between the groups, ensuring that the users were distinct at each stage.

To investigate how the use of educational actions supported by educational technologies influences the self-care of diabetic users in PHC, it was necessary to understand the sociodemographic profile of the population and their pre-existing knowledge about diabetes and self-care. This understanding allowed us to identify knowledge gaps and guide the development of more effective educational interventions, thus structuring the triangulation between the data collected, the analysis of needs, and the implementation of educational actions.

Sociodemographic characteristics of study participants

Thirty-nine interviews were conducted, with an average duration of 15 minutes, varying according to the characteristics and availability of the interviewees at the time of the interview. The group consisted of 87.17% females and 12.82% males, aged between 30 and 83 years, with 53.84% aged 60 years or older. In terms of education, 10.25% were illiterate, 82.03% had not completed elementary school, 2.56% had completed higher education, and 5.12% did not know how to respond. Regarding occupation, 30.76% reported being retired, and 28.20% were engaged in domestic work. Regarding family composition, 71.78% lived with at least one person, including partners and family members, and 76.92% reported a family history of diabetes. A high prevalence of hypertension was also observed, present in 89.74% of respondents, and the main complications reported were mood swings (41.0%), depression (25.6%), cataracts (30.8%), and glaucoma (5.1%).

Knowledge about the pathology was limited, with 53.84% unable to state their type of diabetes, 5.12% stating they had Type 1, and 41.02% stating they had Type 2. It is worth noting that one of the respondents (PS29) did not know their type of diabetes, but based on their explanation, it was found that they had developed gestational diabetes mellitus that continued even after pregnancy. The time of diagnosis varied, with 28.20% between 1 and 5 years, while 10.25% did not know. Regarding treatment, 66.66% used only oral hypoglycemic agents, 28.20% used a combination of insulin and hypoglycemic

agents, 2.56% used only insulin, and 2.56% were not undergoing treatment. Regarding the use of medications, they reported not knowing which medications they used and/or were unsure, resorting to the prescription pad. Regarding blood glucose control, 48.71% reported no decompensation, while 46.15% reported episodes of hyperglycemia and/or hypoglycemia, possibly caused by anxiety, stress, and nervousness in their daily lives. Regarding their last blood test, only 2.56% had had one more than a year ago, and 12.82% did not remember. It is noteworthy that, according to the statements, the health professionals at the unit request an annual test as a condition for updating prescriptions. It is noted that the population maintains good follow-up, periodic tests.

To assess the participants' physical parameters, they were compiled and analyzed using Body Mass Index (BMI), average abdominal circumference, and capillary blood glucose levels, measured at the time of the interview.

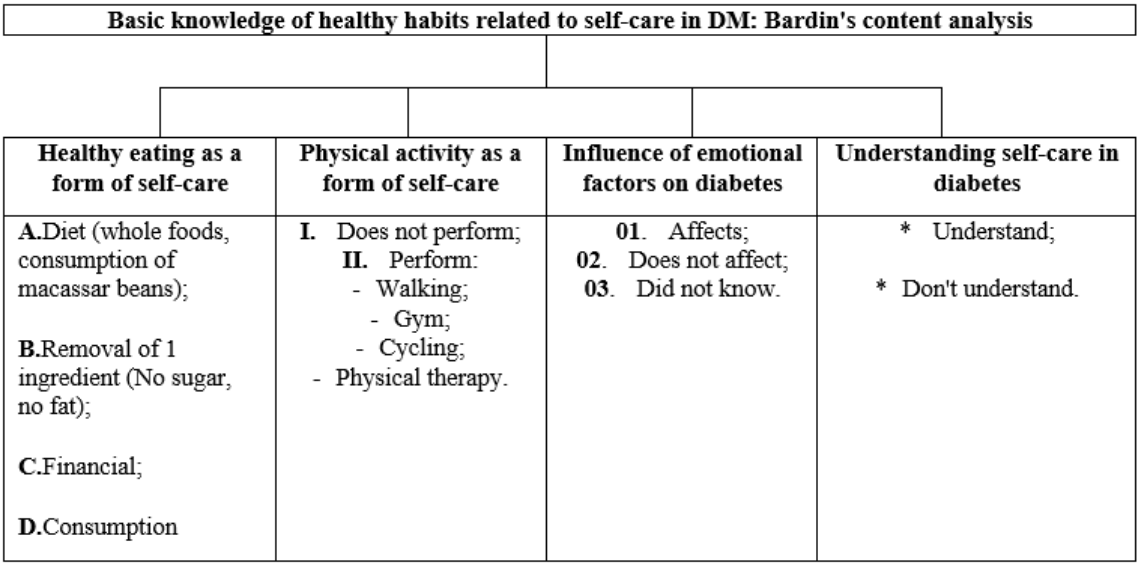
Although 64.10% did not report obesity as a risk factor, according to the parameter analyzed, 35.89% are overweight, 25.64% have grade 1 obesity, 12.82% have grade 2 obesity, and 2.56% have grade 3 obesity. When observing the abdominal circumference values of the respondents, it is noted that, of the total of five men interviewed, 40% of them are not within the ideal range, which is less than 88 cm, 40% fall within the ideal range, and 20% did not report. In the female population, 35.29% are at risk, with an abdominal circumference >102 cm, 2.94% did not want to report, and 76.47% are within the standard measurement.

As for capillary blood glucose, the HGT (Hemoglicoteste) was performed using a monitoring device, the glucometer, where a drop of blood was collected to monitor the blood glucose level at that moment. The postprandial measurement was performed, as it corresponded to the time of the interviews, which took place after lunch, with an ideal value <180 mg/dl. This parameter is ideal for monitoring all diabetic users, for the proper adjustment or not of the medication dose. Regarding the mapping reported here, 41.66% of the interviewees had blood glucose levels above the ideal at the time of the interview.

Basic knowledge of healthy habits related to self-care among study participants

All data were systematized considering the analysis of responses to open questions, by frequency of occurrence of keywords, creating theories and interpretations. Four categories were obtained from the compilation: I. Healthy eating as a form of care; II. Physical activity as a form of care; III. Influence of emotional factors on diabetes and self-care; IV. Understanding of self-care in diabetes (Figure 5).

Figure 1 – Bardin's content analysis scheme, Brazil, 2024



I. Healthy eating as a form of self-care

II.

The responses were classified into eight subcategories: Diet (whole foods, consumption of macassar beans); removal of ingredients (no sugar, no fat); Financial; Standard Brazilian consumption; Controlled; Uncontrolled; Lack of access; Indifferent.

Among them, 17.94% related adequate nutrition to the removal of ingredients such as sugar or fat, 5.12% considered their diet to be controlled because they followed certain proportions, and 15.38% demonstrated a lack of access to or indifference toward food.

II. Physical activity as a form of self-care

The second category concerns physical activity as a form of self-care. This was subdivided into those who engage in regular physical activity (43.58%), categorized into four activities: walking, gym, cycling, and physical therapy, with

walking being the most popular activity, as it does not require many resources to practice. Those who do not engage in physical activity (56.41%) cite physical limitations or low self-esteem as barriers.

III. Influence of emotional factors on diabetes and self-care

In this third category, the influence of emotional factors on diabetes and self-care was investigated.

The responses were divided into those who believe it affects (30.76%), those who believe it does not affect (17.94%), and those who did not know (30.76%).

Of the 30.76% who reported that emotional aspects influence their diabetes, 83.33% said they experience a lot of stress in their daily lives, 8.33% said they experience stress sometimes, and 8.33% reported that they do not experience stress in their daily lives.

Among the 17.94% who reported that emotional conditions have no influence on diabetes, 28.57% experience high levels of stress in their daily lives, 28.57% experience stress occasionally, and 42.85% do not experience stress. However, when asked to explain their statement that there is no influence, they were unable to do so, as their answers were mostly monosyllabic.

IV. Understanding self-care in diabetes

In analyzing the fourth category, the degree of understanding of the concept of self-care in diabetes was investigated. It can be observed that 79.49% did not know how to answer what self-care would be, and only 20.51% associated self-care mainly with diet and physical exercise.

Analysis of the influence of interventions on participants' self-care

To identify the community's needs, interests, and questions on the subject, a pre-intervention called “Survey of topics for developing educational activities” was conducted with the participation of eight users diagnosed with diabetes. At this stage, an interactive poster was created with the questions: “What would you like to know about

diabetes?" and "How would you like to receive this information?". The responses pointed to questions related to capillary blood glucose reference values, proper nutrition (especially regarding which fruits are allowed or not), physical activity, genetic factors, types of diabetes, the concept of prediabetes, and the possibility of a cure. Participants expressed a preference for information conveyed through pictures and dialogue.

The results found were: a lack of knowledge about the disease, difficulty in maintaining a proper diet, and ignorance of the concept of self-care and the complications arising from metabolic imbalance. It was beneficial to promote the discussion of three topics, based on the needs of users, established by the content analysis of the interviews and pre-intervention information, with the application of three interventions: "What is diabetes?", "What is an adequate diet for a person with diabetes?" and "What is self-care and the risks of uncontrolled diabetes?". During these interventions, educational technologies were used to promote greater understanding, popular participation, and dynamism.

In the first intervention, we sought to work on the concept of diabetes in a dynamic way. During the pre-test, participants associated the disease with signs and symptoms such as numbness in the legs, blood glucose testing, consumption of sweets, weight gain, and the presence of sugar in the blood, revealing fragmented knowledge. A serial album (Figures 1 and 2) was used to explain the action of glucose in the body, the role of insulin, the types of diabetes, the concept of prediabetes, signs and symptoms, treatment, reference values, and the (im)possibility of a cure. In the post-test, through a "true or false" game with six questions, the participants performed well, obtaining correct answers in most questions (≥5/6), demonstrating progress in understanding.

Figure 1 – Serial album I

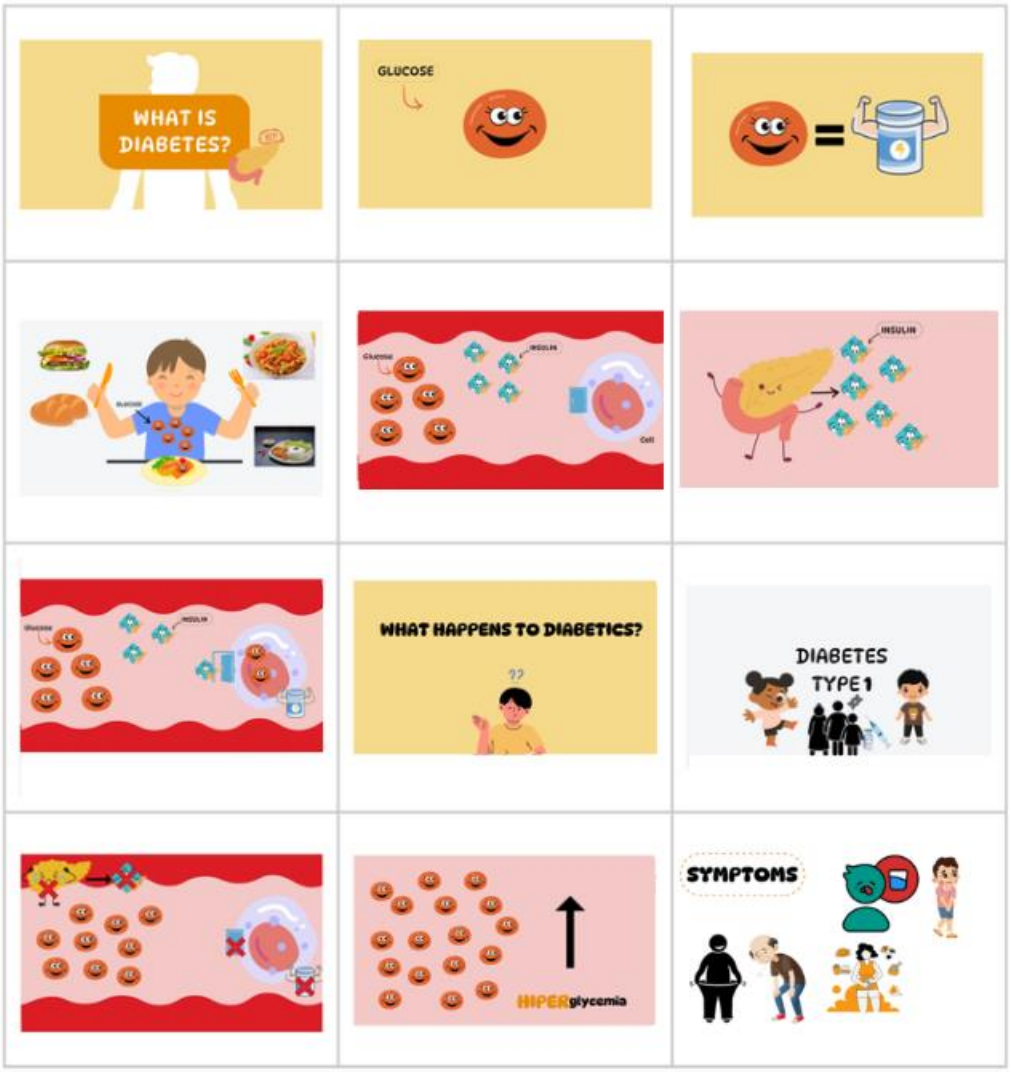
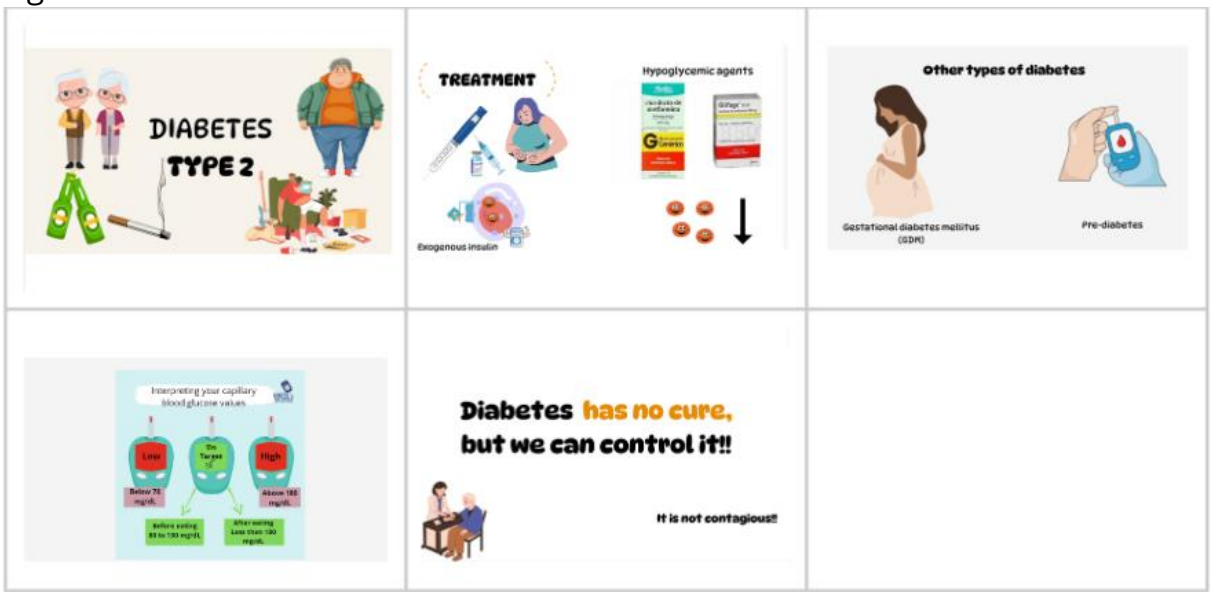


Figure 2 – Serial Album II



The second intervention focused on the theme “What is an adequate diet for a person with diabetes?”, which sought to provide guidance on the importance of a balanced diet for the treatment of diabetes, promoting self-care and observing the particularities of the population. The proposal was presented with a welcome session and a pre-test with the question “How do you think a person with diabetes should eat?”, with answers including the avoidance of sugar and certain foods, as well as some fruits, because they contain too much sugar. A collective construction of an “ideal plate” was carried out, adapted to the reality of the users, using representative pictures of foods. In the post-test, the answers showed changes in discourse, including the appreciation of balanced meals, control of quantities, and removal of certain foods:

> *It's eating beans, rice, meat, and vegetables, all in the right amounts (PS8).*
> *It's not an exaggeration (PS9).*
> *It's not eating too many fried foods (PS10).*
> *It's eating beans without much else in them, in sausage, without duckling (PS11).*

The third intervention focused on the theme “What is self-care and the risks of uncontrolled diabetes?” and began by presenting the goal for the day, followed by a pre-test, which asked: "Who knows how to answer what self-care is? Can anyone tell me what self-care means in diabetes?“ The answer was: ”it means taking care of yourself," in addition to watching your diet and blood pressure. Impressions of complications were used, along with a brief demonstration of the pillars of self-care in diabetes: proper nutrition, physical activity, correct use of medication, and health education. The meeting brought up the discussion on self-care, with a summary of all the topics covered in the interventions, addressing complications, physical activity, its benefits and precautions when performing it; proper nutrition; correct medication; knowledge about the disease, among other precautions and the risks that uncontrolled diabetes can cause (nephropathy, neuropathy, cardiovascular diseases, eye problems, amputations, among others).

The post-test was conducted with the question: “And now, who knows how to answer what self-care is? Can anyone tell me what self-care means in diabetes?” The response was as follows:

> *It's a series of things you have to avoid (PS16).*
> *It's having these four things: food, walking, medicine, and education (PS17).*
> *First of all, for those who have diabetes, it's difficult, because the first thing is diet, and you have to take care of yourself by walking, because walking is very good, not only for our body, but also for blood circulation, and there's medication too (PS18).*
> *This is what we are doing here (PS19).*

Overall, the comparison between the pre- and post-tests (Table 2) showed that there was a knowledge deficit among users, observed in the pre-test, with significant improvement in participants' knowledge after the interventions, both in relation to understanding diabetes and proper nutrition, and in recognizing self-care as an expanded and fundamental practice for controlling the disease, as verified in the post-tests.

Table 2 – Comparison between pre- and post-test of educational interventions on diabetes and self-care, Brazil, 2024

Intervention Theme	Pre-test Key answers	Post-test Key answers	Conclusion comparative
What is diabetes?	Limited concept; associated with signs/symptoms (numbness, heaviness, consumption of sweets, high blood sugar); lack of knowledge about types and causes.	More comprehensive definition; understanding of glucose, insulin, types of diabetes, prediabetes, reference values, and treatment options.	Clear expansion of conceptual knowledge; greater understanding of pathology.
What is an appropriate diet for a person with diabetes?	Restrictive associations ("avoid sugar," "avoid certain fruits"); poor understanding of proportions and balance; financial barriers.	Recognition of the importance of balanced meals, portion control, inclusion of healthy foods, and exclusion of processed meats; ability to assemble an ideal plate.	Improved practical understanding of healthy eating and nutritional self-care.
What is self-care and what are the risks of uncontrolled diabetes?	Limited responses: "Taking care of yourself" or just diet/blood pressure; lack of knowledge about complications.	Expanded concept: diet, exercise, correct use of medication, health education; recognition of complications (nephropathy, neuropathy, cardiovascular disease, eye problems, amputations).	Clear increase in comprehensive understanding of self-care, including shared responsibility and prevention of complications.

Thus, the integration of interviews, content analysis, and observation of pre- and post-tests showed the consistency of the findings. The knowledge gaps identified in the interviews and pre-intervention were addressed in the interventions, reflecting the evolution of conceptual and practical understanding of self-care. Thus, triangulation reinforces the reliability of the results, demonstrating that educational actions supported by educational technologies were effective in expanding knowledge and promoting self-care among diabetic users.

Discussion

This study was conducted in three phases: the first consisted of analyzing the sociodemographic and clinical profile of DM users monitored in PHC; the second involved analyzing data to identify the level of knowledge about the disease and self-care; and the third phase included the implementation of educational actions, followed by evaluation. The main findings demonstrated a significant prevalence of factors that compromise glycemic control, such as lack of knowledge about one's own clinical condition, low level of education, physical inactivity, presence of comorbidities, and emotional fragility. After the educational interventions, an improvement was observed in users' understanding of nutrition, the importance of physical activity, and the expansion of the concept of self-care, highlighting the positive impact of participatory actions in promoting autonomy and co-responsibility of individuals in diabetes management.

The sociodemographic results showed a predominance of females among the participants, corroborating the 2023 findings of the Surveillance of Risk Factors for Chronic Diseases by Telephone Survey (VIGITEL), which point to a higher prevalence of diabetes among women. This predominance, however, may reflect both a higher incidence of the disease in this group and a greater demand for health services by the female population, as suggested by Gutmann.[14] The concentration of individuals over the age of 60 reinforces the findings in the literature, which associates aging with a higher risk of developing DM.[15] The low level of education identified is consistent with the SBD, which links reduced education to the diagnosis of the disease and lower therapeutic adherence.[16]

The family composition of participants proved to be relevant to the self-care process, since family support contributes to encouraging adherence to treatment and overcoming socioeconomic and cultural barriers.[17] Furthermore, the significant presence of hypertension as a comorbidity reflects the cardiovascular overload to which diabetic individuals are exposed,[18] while the high rate of emotional (anxiety and depression) and ophthalmic (cataracts and glaucoma) complications reinforces the need for multidisciplinary care, including mental health and ophthalmology.

The finding that more than half of the respondents (53.84%) were unable to identify their type of diabetes, as well as being unaware of the name or mechanism of their medications, highlights a gap in their knowledge of their own health condition. This deficit has repercussions on therapeutic adherence and self-care capacity, which are essential elements for glycemic control. These results reiterate the importance of ongoing educational strategies in PHC, capable of transforming knowledge into everyday care practices.

Anthropometric parameters showed rates of overweight and obesity, as well as increased abdominal circumference in some of the respondents, confirming metabolic risk factors for cardiovascular complications reported in the literature.[19] The high postprandial capillary blood glucose values observed indicate failures in glycemic control, even among those who reported adherence to treatment. Despite undergoing periodic tests, the high rate of clinical decompensation suggests that the frequency of monitoring needs to be accompanied by a more effective approach to health education, focusing on understanding the disease, correct use of medication, and encouraging lifestyle changes.

With regard to the basic knowledge of healthy habits related to self-care among study participants, it was found that healthy eating was often associated with the idea of dietary restriction rather than nutritional balance, in line with recommendations from the American Diabetes Association (ADA) and the Brazilian Diabetes Society (SBD). However, financial factors and lack of access to adequate food emerge as important barriers, reinforcing the importance of considering the socioeconomic context in dietary guidelines and strengthening public policies that promote food security.

Less than half of the participants reported engaging in physical activity, with walking being the most common form as it does not require additional costs. On the

other hand, the lack of physical activity, motivated by physical limitations and low self-esteem, reflects the need for encouragement and adapted strategies. The literature confirms that regular physical activity is an essential component in diabetes control, bringing numerous benefits, such as increased cardiorespiratory fitness, decreased insulin requirements, improved endothelial function, decreased serum cholesterol, and increased vascular health, along with improvements in body composition and quality of life.[20]

With regard to emotional aspects, it was found that some users recognize stress as a factor that impacts diabetes management. Emotional aspects have a considerable effect on diabetic users, who suffer emotional distress from the moment of diagnosis to the stresses of living with the disease.[21] Recent studies indicate that people diagnosed with diabetes are more likely to develop emotional disorders, as previously mentioned, such as depression, anxiety, and stress. These reasons and adverse situations in their daily lives can interfere with or even hinder the care and management of the disease.[22-23] The impact of emotional factors on treatment adherence was also significant. The stress and anxiety reported by participants affect glycemic control, requiring PHC teams to incorporate listening and psychological support as part of their care activities.

After the interventions, a reframing of the concept of self-care was observed: from a passive and restricted notion, it shifted to a broader understanding, encompassing everyday attitudes and shared responsibility in the therapeutic process. A relationship was found between low educational attainment and a passive attitude toward self-care, highlighting the need for accessible and continuous educational strategies.

In this context, the care process must be shared, based on health education and self-care. Educational activities carried out in PHC are necessary for the development of active, autonomous users who are jointly responsible for their care. It is in these spaces that it is possible to develop moments of dialogue, learning, and knowledge sharing, always based on welcoming, qualified listening, affection, and the shared construction of knowledge. Educational actions, provided they are effective and use educational strategies and technologies that can stimulate greater interaction between users and health professionals, can influence the self-care of people with diabetes.

Initially, low user adherence to educational activities was observed, reflecting the limited perception that visits to the unit are restricted to obtaining prescriptions or consultations. This view demonstrates a lack of knowledge about the benefits of educational activities, which are an integral part of treatment and contribute to the prevention of complications.

Regarding the analysis of the influence of educational actions on self-care in diabetes, the knowledge deficit identified in the pre-test points to weaknesses in the population's understanding of the disease, its risk factors, and complications. In this sense, the participation of users in the educational process, from the choice of topics to the final evaluation, proved to be fundamental for building learning contextualized to the needs of the community.

When addressing nutrition, the change in perception became evident: initially restricted to the idea of prohibition, it came to be understood as a practice of balance and quality, a fundamental aspect for glycemic control and prevention of complications. The concept of self-care was redefined, no longer understood only as “taking care of oneself” in a generic way, but now encompassing diet, physical activity, adherence to drug treatment, and participation in educational processes.

Thus, self-care comes to be understood as an expression of autonomy and shared responsibility, overcoming the model centered on prescriptions and specific actions. It implies behavioral and reflective change, stimulated by the actions of the health team, especially PHC, which should promote protagonism and critical thinking among users.[24]

Orem's Self-Care Theory supports these findings, emphasizing that health education aims to develop autonomy and the skills necessary for self-management. This perspective reinforces the importance of empowering users to make conscious and co-responsible decisions about their health.

Among the limitations of the study, we highlight the low initial adherence, the short follow-up period, limiting the analysis of the impact on self-care in the medium and long term, as well as the absence of standardized instruments for assessing emotional aspects, which were not the central focus of the research. In addition, the study was conducted in a health unit that has adequate physical structure, with space

for user meetings, and that does not face access difficulties, such as basic units located in rural areas, for example, which would have limitations in establishing the proposal of this study. Even so, the study manages to describe a semi-structured “roadmap” for effectively implementing hyperday meetings in basic health units. The study was constructed through the analysis of the needs of a population, understanding the importance of knowing the community and carrying out educational actions within PHC. In addition to enabling health professionals and users to redefine the concept of self-care in the lifestyle of a person with diabetes.

Conclusion

The educational actions developed in PHC proved to be decisive in promoting self-care among users with diabetes, favoring the expansion of knowledge, change in attitudes, and shared responsibility in disease management. Based on the interventions, it was observed that self-care was no longer perceived as a one-off, passive practice, but rather as an active, reflective, and continuous process involving four pillars of self-care in diabetes: a balanced diet, therapeutic adherence, physical activity, and health education.

The results show that health education acts as a transformative tool, capable of reducing knowledge gaps, stimulating autonomy, and strengthening the bond between users and the multidisciplinary team. Orem's theory reinforces this understanding by highlighting that the development of self-care skills depends on stimulating autonomy and critical thinking, aspects that are enhanced by educational practices.

However, the effectiveness of these actions requires continuous planning, participatory methodologies, and adaptation to the sociocultural reality of users in order to overcome barriers such as low educational attainment and limited adherence.

It can therefore be concluded that educational actions have a direct and positive influence on the self-care of people with diabetes, promoting knowledge and empowerment, and can assist in therapeutic adherence and a better quality of life. Its consolidation as a permanent strategy of PHC is essential to strengthen self-management of the disease and contribute to reducing complications associated with diabetes.

In this context, it is necessary to reflect on the promotion of health education in PHC services, given that, in the face of high demand for care, professionals often prioritize consultations aimed at renewing prescriptions, limiting themselves to a pharmacological approach to treatment. The effective development of self-care implies a multidisciplinary and intersectoral approach capable of promoting behavioral changes and empowering users to take charge of their own health care. Thus, PHC is not only a place of welcome, but also of awareness and transformation, promoting co-responsibility and community engagement in the fight against diabetes.

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