

## HEALTH EDUCATION AND EFFECTIVENESS OF THE WAITING ROOM METHOD ON THE PREVENTION OF DIABETES MELLITUS COMPLICATIONS: AN EXPERIENCE REPORT

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**Abstract:** Introduction: diabetes mellitus (DM) is a metabolic disease characterized by elevated glycemic levels. Its prevalence has tripled in the past 20 years and is estimated to affect 693 million people worldwide by 2045. The primary diagnostic criteria for DM include specific clinical symptoms and laboratory test results. DM can lead to macrovascular complications, such as cardiovascular diseases, and microvascular complications, including diabetic nephropathy, retinopathy, and neuropathy. Patients with type 2 diabetes have a higher risk of developing cardiovascular diseases. Objectives: to provide information about diabetes, raise awareness about complications, and evaluate the effectiveness of the Waiting Room as a health education tool. Methodology: a health education intervention was conducted at a primary health care unit to improve patients' knowledge about diabetes and its complications. The intervention aimed to promote lifestyle changes, therapeutic adherence, and better glycemic control. The intervention included interactive activities, pamphlets, and banners to enhance knowledge retention. The intervention targeted patients at the primary health care unit and used non-probabilistic convenience sampling. The strategy involved raising awareness about potential complications, emphasizing recommendations for prevention, and using the waiting room as a space for education. Information was obtained from reliable sources, such as the Brazilian Diabetes Society and the Brazilian Ministry of Health. Results and discussion: the results showed a lack of knowledge about complications among the participants. However, there was awareness of the importance of physical activity and dietary care. The discussion highlighted the need for proper management of complications and preventive measures. Conclusion: the study suggests the incorporation of multidisciplinary approaches in clinical

practices and educational programs to reduce complications. The intervention was considered useful by the participants, and there was a suggestion for its continuity. Overall, the health education project aimed to improve patients' understanding of diabetes, promote healthy habits, and reduce complications and mortality. **Keywords:** Diabetes; Waiting Room; Brazil; Chronic Diseases; Endocrinology.

## INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease characterized by elevated glycemic levels in affected individuals. According to Vilar et al. (2020), the prevalence of this condition has tripled in the past 20 years, and it is estimated to affect 693 million people worldwide by 2045, as reported by Cole et al. (2020). Currently, diabetes affects approximately 13 million Brazilians, equivalent to 6.9% of the country's population, according to the Brazilian Diabetes Society. It is important to emphasize that this comorbidity does not arise from a single component or specific etiological agent, but rather from a combination of metabolic and individual factors that contribute to the development of diabetes mellitus, including genetic and environmental aspects. Therefore, it is a heterogeneous disease that ultimately results in hyperglycemia, as described by Petersmann et al. (2019).

The primary diagnostic criteria for DM involve the association between the specific clinical presentation of the pathological progression and the results of laboratory tests that support the diagnostic hypothesis. The classic symptoms include heterogeneous manifestations, but the relevant symptoms that should guide clinical consultation are polyuria, polydipsia, polyphagia, and pronounced weight loss.

In addition, the most commonly used

laboratory tests include fasting blood glucose levels above or equal to 126 mg/dl, abnormal results in the Oral Glucose Tolerance Test (OGTT) with a value equal to or exceeding 200 mg/dl after 2 hours of consuming 75g of glucose, and glycated hemoglobin (HbA1c) levels equal to or above 6.5%. It should be noted that to establish a diagnosis, at least two abnormal test results must be present, in accordance with the 2021 Guideline of the Brazilian Diabetes Society.

Diabetes has become a progressive global problem due to the increasing number of affected patients and the negative impact its consequences can have on their quality of life. The complications of diabetes can be broadly classified as macrovascular and microvascular. Macrovascular complications, also known as cardiovascular diseases, primarily affect "central organs," such as the heart muscle, leading to Acute Myocardial Infarction (AMI), the brain, which is susceptible to stroke (cerebrovascular accident), and the lower limbs, as seen in Peripheral Arterial Disease (PAD).

In addition to macrovascular complications, microvascular complications pose a significant obstacle in patients' lives. Diabetic Nephropathy (DN) affects approximately 30% of diabetics and progresses to Renal Failure, transitioning through stages of microalbuminuria as the initial stage and clinical nephropathy (macroalbuminuria or proteinuria) as the advanced stage. Another complication is Diabetic Retinopathy (DR), which is more common in type 1 diabetes patients and directly depends on the duration of the disease, with its complexity increasing after years of diagnosis. DR is generally characterized by the presence of microaneurysms, microhemorrhages, hard exudates, and cotton wool spots, as described by Tschiedel (2014). Finally, Diabetic Neuropathy (DN) is the latest manifestation

among patients and refers to the clinical dysfunction of peripheral nerves in diabetics, representing an exclusive diagnosis and involving impairment of the nervous system.

According to the Guidelines of the Brazilian Diabetes Society, patients with Type 2 Diabetes mellitus have a two to four times higher risk of developing cardiovascular diseases, such as ischemic stroke, heart failure, peripheral arterial disease, and microvascular diseases.

In this context, a health education intervention was carried out by medical students at the César Cals Primary Health Care Unit (UAPS). The César Cals Primary Health Care Unit, located at 555 Capitão Aragão Street, in the Alto da Balança neighborhood, Fortaleza-CE, was created, like all other basic units, with the purpose of providing initial local medical care to alleviate the burden on hospitals and offer disease prevention and improved quality of life to the community, considering the specific health issues of that population and the available primary and medium complexity care services.

Thus, based on the routine of the unit, the high number of patients with diabetes mellitus under follow-up was evident, indicating the need for intervention to improve their quality of life and access to information. The focus of the educational action was to increase patients' knowledge about the consequences of this metabolic disorder. Therefore, this topic was chosen with the objective of guiding patients about the complications that diabetes can cause and promoting therapeutic adherence for better glycemic control and slower disease progression.

The intervention aimed to promote lifestyle changes among diabetic patients, ensuring glycemic control and reducing the progression of diabetes. These changes in habits involve the introduction of practices that significantly contribute to lowering

glucose levels, such as promoting adherence to a diet that includes low-sugar foods, reducing carbohydrate and fat intake, and increasing protein consumption.

Additionally, it is essential to highlight the inclusion of physical activity in patients' routines, as exercise promotes reduced liver fat (reducing hepatic steatosis) and increased insulin sensitivity in the organ, as concluded in a study comparing obese, sedentary mice to animals consuming the same diet but engaging in moderate strength exercises for 15 days, according to Pereira et al. (2014). Another relevant factor in minimizing diabetes complications is therapeutic adherence, in which patients who correctly use medications at the right doses and intervals support glycemic control and reduce the short-term and long-term damage that diabetes can cause.

The primary objective of the conducted intervention was to instruct the participants in adopting transformative measures for their future lives. The effectiveness of the method relied on encouraging their active participation through interactive activities that held their attention for a considerable period, thereby enhancing the amount of knowledge retained in short-term memory. Other mechanisms used included distributing pamphlets and displaying banners to reinforce the information and allow patients to take them home, serving as both a direct and indirect transmission channel. This way, they could deepen their own understanding of the topic and also share the information with relatives or close contacts.

In this context, the null hypothesis of this article consists of the non-effectiveness of the instruction and the method utilized. Furthermore, it is important to observe if patients had questions and shared their personal experiences with the disease, as this indicates their comprehension of the activity, particularly when they can relate to the

complications explained in the presentation. For example, if they identify with symptoms they have previously experienced or recognize someone they know who has diabetes and exhibits the clinical signs described by the team. Such facts can confirm that patients have absorbed the shared knowledge during the intervention project.

Therefore, this health education project is of utmost importance due to the need to provide guidance to the population. By reflecting on the potential complications, patients can develop better therapeutic adherence and make necessary changes to unhealthy habits, always using accessible language to facilitate comprehension. These actions contribute to improving the quality of life, reducing diabetes-associated complications, and mortality.

## OBJECTIVES

**General:** Provide updated information about Diabetes mellitus to patients at UAPS César Cals, in order to promote a better understanding of the disease and encourage the adoption of healthy habits, and analyze the effectiveness of the Waiting Room as a health education tool.

### Specifics:

- Stimulate patients to adhere to the treatment of the disease and undergo regular medical follow-up.
- Raise awareness about the main complications associated with Type 2 Diabetes mellitus and provide information on how to prevent them.
- Evaluate the effectiveness of the Waiting Room as a tool used to build knowledge about the complications of Type 2 Diabetes mellitus.

## METHODOLOGY

### STUDY TYPE

This study is an experience report that addresses a health education intervention promoted by fourth-semester students from the School of Medicine at the University of Fortaleza (UNIFOR), enrolled in the module of Integrated Actions and Practices in Health IV (APIS IV), which provides students with clinical and community experiences in primary care.

### TARGET POPULATION

The study targeted attendees affiliated with UAPS César Cals de Oliveira, located in the Alto da Balança neighborhood, in the city of Fortaleza, Brazil. The intervention was conducted with patients who were present at the primary health unit, which hosted an event focused on care for diabetic and hypertensive patients at a specific date and time. Therefore, the sample used for the study is a non-probabilistic convenience sampling. There were 18 people present, ranging in age from approximately 45 to 65 years old. The participants' education level ranged from none to completed higher education. It is important to note that the data regarding age and education are estimated based on the pattern of patient presentation at the event, as it was not possible to individually collect sociodemographic data.

### STRATEGY

Through the experiences gained by the authors in the APIS IV module classes, it was noted that many patients at UAPS César Cals de Oliveira had a lack of knowledge regarding the complications of Diabetes mellitus. Therefore, there was a perceived need for an intervention focused on the education and health promotion of these individuals. Thus,

the strategy used in the intervention was to raise awareness about potential complications caused by the disease, as well as inform and encourage the necessary care to prevent them.

Considering that Diabetes is a chronic and systematic condition that requires ongoing attention, the intervention team conducted an educational activity about the recommendations that diabetic patients should follow to prevent potential complications. Therefore, the importance of annual consultations with an ophthalmologist, daily foot inspection, a balanced diet with low glycemic index foods, and weekly physical activity were emphasized.

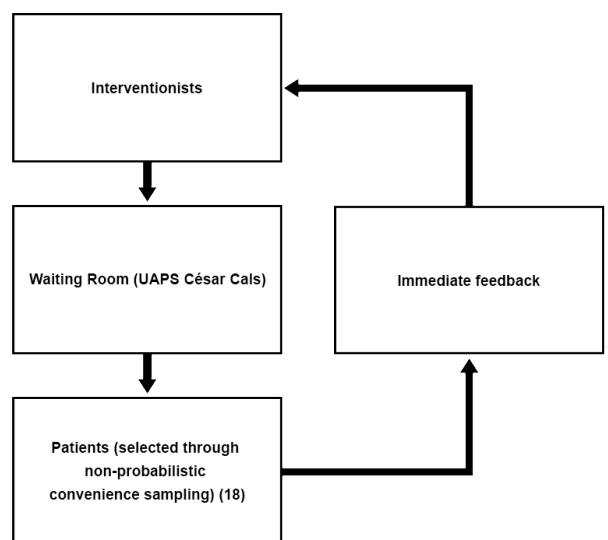
To promote health education and create a space for reflection and action, based on technoscientific and popular knowledge, we used the Waiting Room methodology. This approach involves presentations and discussions with patients who are waiting to be seen by healthcare professionals. Our team proposed an enlightening dynamic of “Truths and Lies” about Diabetes. During the dynamic, we presented statements to the participants, who had to indicate whether the statement was true or false based on their prior knowledge. We also used a roulette wheel that pointed to “Recommendations” or “Complications of Diabetes” to direct the statements, with the roulette being operated by the participating patients themselves. Subsequently, a brief dialogue took place to clarify any doubts about the topics. We distributed and explained a pamphlet (Appendix A) that addressed recommendations and complications of Diabetes, utilizing visual aids. The intervention took place along with an interdisciplinary health campaign focused on patients at UAPS living with Diabetes and Hypertension, allowing for the contribution of multiprofessional knowledge to the project, including counseling from nutritionists, nurses, and physicians.

## SOURCES OF INFORMATION

To scientifically support the proposed activity and provide theoretical knowledge to the attending patients, we used evidence-based information obtained from the official websites of the Brazilian Diabetes Society and the Brazilian Ministry of Health. These reliable sources provided us with updated recommendations and information on the management of Diabetes mellitus.

## LIMITATIONS

Possible limitations of the intervention include the absence of sound equipment at the location and the noise coming from the nearby multidisciplinary educational campaign, which compromised the patients’ ability to listen to and comprehend the presentation. Additionally, the high number of people present, considering the size of the space used, and the seating arrangement in a single row negatively impacted the attention given to patients seated at the ends. These limitations were taken into consideration in the interpretation of the results and analysis of the intervention’s effects.



Flowchart 1: representation of the methodology employed.

## RESULTS AND DISCUSSION

### RESULTS

The results obtained from the activity conducted with a group of 18 individuals, including 6 diagnosed with diabetes, were considered productive. The patients were waiting for care at an interdisciplinary campaign for diabetes and hypertension awareness.

It was observed that the group had a significant lack of knowledge regarding the potential complications of diabetes. Only 1/3 (6) of the participants correctly answered whether the statement “Diabetic retinopathy is a progressive disease that can cause blindness when left untreated” was a myth or a truth. Furthermore, only one patient was aware that diabetes could affect the normal functioning of the kidneys, manifesting through symptoms such as increased blood pressure, swelling in the legs, feet, and hands, increased urinary frequency, and excessive thirst. There was also a lack of knowledge among 1/3 (6) of the patients regarding neuropathic consequences such as foot and hand pain, tingling sensation, burning, numbness, weakness, and sexual and erectile dysfunction associated with diabetes.

Regarding statements related to prevention, a higher average accuracy rate was observed. Approximately 55% (10) of the patients waiting were aware of the importance of physical exercise and dietary care for those diagnosed with diabetes. However, when asked about the need for daily physical activity, approximately 85% (15) answered correctly. In relation to the statement about a low-calorie, low-carbohydrate, low-fat, and high-fiber diet to control the potential complications of diabetes, about 55% (10) of the patients answered correctly. However, only about 1/3 (6) of the participants were aware that foods like orange juice and saltine crackers are not recommended for diabetic patients due to

their glycemic index. Furthermore, about 70% (12) of the participating individuals were unaware of the need for self-care with their feet, annual assessment, and the use of appropriate footwear to avoid comorbidities.

### DISCUSSION

The presentation conducted in the health center waiting room about the complications of Diabetes mellitus was unique and relevant, providing essential information to patients and contributing to population education and clinical practice. The Waiting Room presentation was effective in providing information and essential tools to patients, assisting them in making informed decisions and promoting health. However, it is important to mention the limitations encountered, such as the lack of adequate space and excessive noise, which may have impacted the participants' experience. Most participants reported that the intervention was useful in increasing their understanding of Diabetes mellitus and the importance of self-care, while some participants suggested the continuity and need for this type of educational activity at the health center.

During the discussion, the patients demonstrated significant concern about the complications arising from diabetes, such as diabetic retinopathy, diabetic neuropathy, diabetic nephropathy, cardiovascular diseases, and diabetic foot. They emphasized the need for proper management of these complications due to their negative impact on quality of life. For example, several patients shared their personal stories about the difficulties they faced due to these complications, emphasizing the importance of preventive measures and proper care.

The concern expressed by patients aligns with recent literature findings, presenting important practical implications. During the presentation, patients questioned

and reflected on the adoption of specific preventive measures, such as the importance of maintaining careful hygiene, daily foot inspections, wearing appropriate footwear, and seeking immediate medical attention in case of injuries. These recommendations are consistent with the study by Ramirez-Perdomo et al. (2019), which demonstrated the effectiveness of these practices in preventing diabetic complications. These reflections and guidance should be incorporated into clinical practices and educational programs to reduce the incidence of complications.

The lack of knowledge on basic topics, such as the approximate nutritional value of foods contraindicated for diabetics, denotes the ineffectiveness of the knowledge transfer method adopted, where information is often only exchanged between doctor and patient. A multidisciplinary approach involving nutritionists, psychologists, and physiotherapists, for example, has shown a significant difference when patients underwent nutritionist counseling or nurse-led awareness, as demonstrated in the study by Scain et al. (2018), which evaluated the effects of nursing care in an educational program for diabetic foot prevention. This study highlights the crucial role of nursing professionals in the education and care of patients with diabetes. During the presentation, the multidisciplinary team emphasized the importance of active patient participation in specialized care programs, involving trained nursing professionals. This practical approach strengthens the implementation of prevention strategies and underscores the relevance of teamwork in complication prevention.

It is evident that socioemotional aspects dramatically influenced the accuracy of patients' responses, as denoted by private discussions with some of the patients who chose to share their stories with the interventionists. It is noticeable that a

significant socioemotional factor influenced the response accuracy: whether the patient has or had a close acquaintance who suffered from diabetes complications. Addressing not only the physical but also the psychological aspect of the disease is essential, as indicated by the study by Portela et al. (2022), for treatment adherence and improving patient prognosis.

These results highlight the need to improve patients' awareness and knowledge about the complications and proper management of diabetes, especially concerning comorbidities associated with the disease. The implementation of educational programs addressing this information comprehensively is recommended to enhance patients' understanding and reduce the incidence of complications. The number of errors considering this issue was higher compared to questions related to prevention.

When relating the findings to recent scientific studies, the lack of adequacy in the currently used measures and the absence of a necessary multidisciplinary approach are notable. Critical analysis of the mentioned studies revealed limitations, emphasizing the need for further research. Practical applications, such as preventive measures and the importance of health education through more comprehensive methods, should be implemented in clinical practice and educational programs. Future considerations include exploring screening strategies and targeted preventive interventions for at-risk populations, in addition to considering the demonstrated effective use of the Waiting Room method. These discussions contribute to promoting a better quality of life and prognosis for patients with diabetes, highlighting the importance of a holistic approach in caring for these individuals. This approach aims to enhance communication in programs, resulting in better understanding,



adherence, and effectiveness. These measures can contribute to better disease management and reduce the impact of complications on the quality of life of individuals with diabetes.

## **CONCLUSION**

The study revealed a high prevalence of Diabetes mellitus and its complications, highlighting a superficial knowledge among patients about the subject and the severity of the condition, such as in the case of diabetic foot and its preventive measures. Therefore, this behavior suggests that current health education policies may not be achieving effective results, especially concerning these individuals. For instance, during the intervention, many patients demonstrated superficial knowledge about Diabetes mellitus and its complications, emphasizing the need for more effective approaches. In this scenario, the intervention agents communicated the information clearly during the activity, aiming to encourage adherence to Diabetes treatment while emphasizing the importance of proper medical monitoring.

The adoption of a collaborative approach in the intervention allowed for an exchange of information between the authors and the local community. The authors clarified doubts, and patients shared their experiences, enriching the discussion about Diabetes mellitus complications and prevention strategies. Consequently, the main complications associated with Diabetes were debated, along with their main preventive measures, helping to highlight the presence of these consequences in individuals' daily lives, even without an apparent direct connection.

The adopted approach proved to be effective, evidenced by the participants' deep engagement with the proposed activities, such as the distribution of informative pamphlets and banners. Moreover, the resolution of doubts during the intervention

demonstrated an enhanced understanding of Diabetes mellitus and its complications among the participants. The distribution of informative pamphlets and banners proved effective in consolidating knowledge about Diabetes mellitus and its complications, with a clear and implicit sharing of competencies. It is noticeable that the method used had a significant impact on the respective population, showing a better understanding of the condition and its impacts compared to absent individuals.

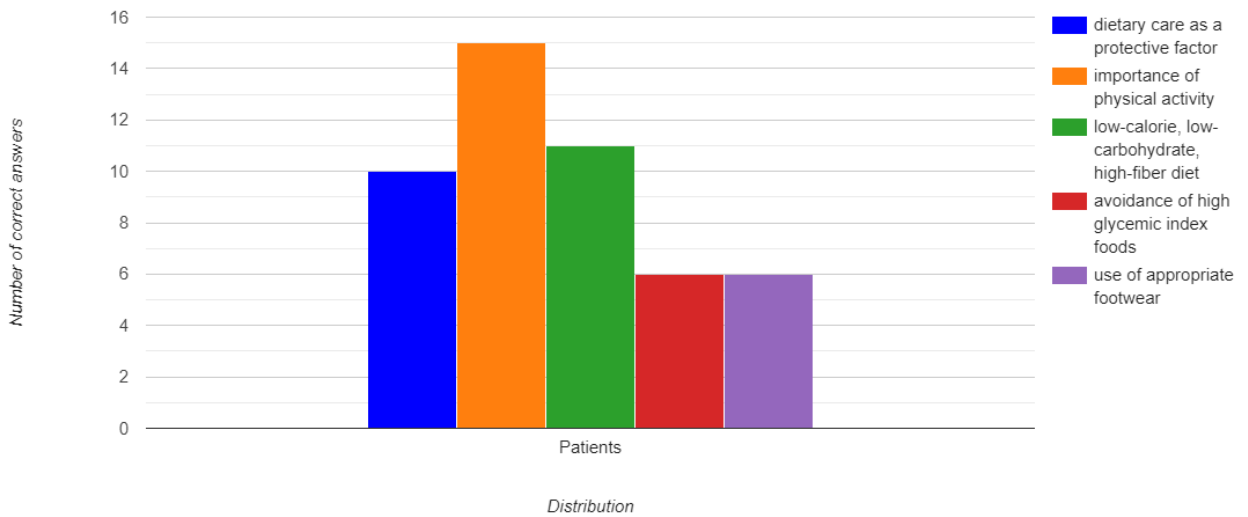
From a broader perspective, a surprising turnaround during the intervention can be observed, as a more comprehensive knowledge of the subject was expected. These results highlight the need to improve health promotion strategies to provide more detailed information about Diabetes mellitus, its complications, and preventive measures. Although it is a widely addressed topic, there is still a significant portion of the population lacking this essential knowledge. During the action, the effectiveness of the method in knowledge absorption by the participants was immediately observed, making it a facilitator for perceiving the relevance of better therapeutic adherence and unhealthy habit changes in disease control.

For future projects, it is recommended to carefully consider the timing and location of interventions to reach as many individuals as possible and ensure facilitated communication without significant interruptions. To facilitate immediate patient feedback regarding the "Waiting Room" method, conducting a questionnaire collecting accurate participant information such as age, gender, and education is suggested. This information can help evaluate the effectiveness of the intervention and guide future improvements.

## **ACKNOWLEDGEMENTS**

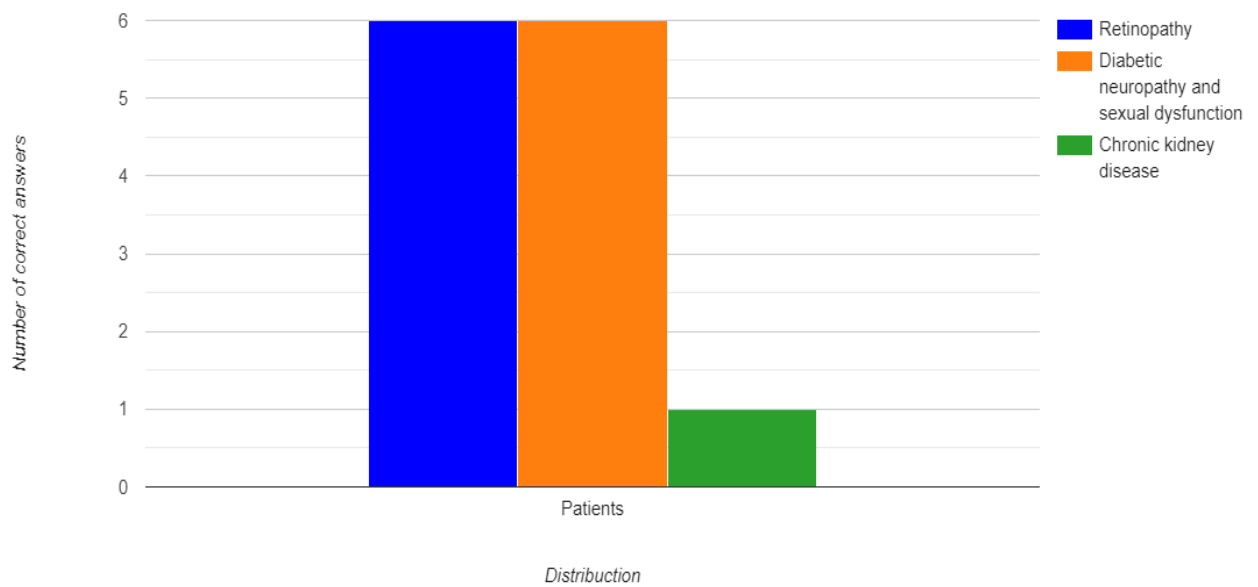
We express our gratitude to all the authors

### Accuracy rate regarding questions related to health prevention



Graphic 1: accuracy rate regarding questions related to comorbidities.

### Accuracy rate regarding questions related to comorbidities



Graphic 2: accuracy rate regarding questions related to health prevention.

and researchers whose work and publications served as the theoretical foundation for this study. Additionally, we acknowledge the guidance, support, and specialized knowledge provided by professors Mayara Ponte Madeira,

Marcos Bentes Luna de Carvalho, and Priscilla Leite Campelo de Medeiros throughout this work. Special thanks to UAPS César Cals de Oliveira for providing us with the opportunity to conduct this study.

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Appendice A: translated design used for banners and brochures.



Appendice B: images representing the dynamics of the method.