



KNOWLEDGE OF DIABETES MELLITUS AMONG PUBLIC SCHOOL PROFESSIONALS

Conhecimento sobre diabetes mellitus entre profissionais da rede pública de ensino

Conocimiento sobre diabetes mellitus en profesionales de la educación pública

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ABSTRACT

Objective: To describe the public school professionals' knowledge of the disease, treatment and complications to the health of people with Diabetes Mellitus. **Methods:** Cross-sectional observational study, in which a structured questionnaire was applied to 50 employees of public schools in the city of Natal, Rio Grande do Norte State, Brazil, in the year 2014, comprising 30 open and closed questions that addressed information on the employee's identification and their knowledge of the disease, complications and care in the management of the diabetic individual in cases of hypoglycemia. Measures of association were held between the professionals' knowledge of diabetes and the independent variables (age, gender, and profession), adopting $p < 0.05$ as level of significance. **Results:** Teacher was the only professional position showing association with the knowledge of the disease. Of those surveyed, 62% ($n=36$) were able to define the disease, 86% ($n=43$) knew the forms of treatment, and only 28% ($n=14$) the normal values for blood glucose. **Conclusion:** The knowledge demonstrated by the assessed professionals covers the dimensions relating to the definition, complications and forms of treatment. Nevertheless, less knowledge of care and management of the disease was evidenced, especially when asked about risk situations such as hypoglycemia and normal blood glucose level.

Descriptors: Diabetes Mellitus; Health Knowledge, Attitudes, Practice; Workers; School Health.

RESUMO

Objetivo: Descrever o conhecimento de profissionais da rede pública de ensino sobre a doença, o tratamento e as complicações à saúde de pessoas com diabetes mellitus. **Métodos:** Estudo transversal, observacional, em que se aplicou questionário estruturado a 50 funcionários de escolas públicas da cidade de Natal, Rio Grande do Norte, no ano de 2014, contendo 30 perguntas abertas e fechadas que abordavam informações a respeito da identificação do funcionário e do seu conhecimento em relação à doença, complicações e cuidados no manejo do portador de diabetes em casos de hipoglicemia. Foram realizadas medidas de associação entre o conhecimento dos profissionais sobre diabetes e as variáveis independentes (idade, gênero e profissão), sendo adotado nível de significância $p < 0,05$. **Resultados:** Apenas a profissão de professor mostrou associação com o conhecimento sobre a doença. Dos entrevistados, 62% ($n=36$) conseguiram definir a doença, 86% ($n=43$) conheciam as formas de tratamento e apenas 28% ($n=14$) conheciam os valores de normalidade para a glicemia. **Conclusão:** O conhecimento dos profissionais investigados a respeito da diabetes abrange as dimensões relativas à definição, complicações e formas de tratamento. Porém, ficou evidenciado que possuem menos conhecimento sobre os cuidados e o manejo da doença, especialmente quando questionados sobre situações de risco, como hipoglicemia e valor de normalidade para a glicose.

Descritores: Diabetes Mellitus; Conhecimentos, Atitudes e Prática em Saúde; Trabalhadores; Saúde Escolar.



RESUMEN

Objetivo: Describir el conocimiento de profesionales de la educación pública sobre la enfermedad, el tratamiento y las complicaciones para la salud de personas con diabetes mellitus. *Métodos:* Estudio transversal y observacional en el cual se aplicó un cuestionario estructurado para 50 empleados de escuelas públicas de la ciudad de Natal, Rio Grande do Norte en el año 2014 con 30 preguntas de desarrollo y del tipo test sobre informaciones respecto la identificación del empleado y su conocimiento de la enfermedad, las complicaciones y los cuidados para el manejo del paciente con diabetes en casos de hipoglucemia. Fueron realizadas medidas de asociación entre el conocimiento de los profesionales sobre la diabetes y las variables independientes (edad, género y ocupación) con el nivel de significación de $p < 0,05$. *Resultados:* Solamente la ocupación de profesor mostró asociación con el conocimiento de la enfermedad. Entre los entrevistados, el 62% ($n=36$) definieron la enfermedad, el 86% ($n=43$) conocían las formas de tratamiento y solamente el 28% ($n=14$) conocían los valores de normalidad para la glucemia. *Conclusión:* El conocimiento de los profesionales investigados sobre la diabetes comprende las dimensiones de la definición, las complicaciones y las formas de tratamiento. Sin embargo, es evidente que ellos tienen menos conocimiento de los cuidados y del manejo de la enfermedad en especial cuando se les preguntó sobre las situaciones de riesgo como la hipoglucemia y el valor de normalidad de la glucosa.

Descriptor: Diabetes Mellitus; Conocimientos, Actitudes y Práctica en Salud; Trabajadores; Salud Escolar.

INTRODUCTION

Diabetes appears as a global health emergency in the 21st century, given that, from year to year, more people live with this condition, which can lead to complications and irreversible damage throughout life⁽¹⁾. There are approximately 415 million adult diabetics worldwide, with 29.6 million living in Latin America and 44.3 million in North America and the Caribbean⁽¹⁾. Brazil is considered the country with the third highest number of children with type 1 diabetes, featuring approximately 30,900 diagnosed cases, surpassed only by the United States and India, where prevalence reaches 84,100 and 70,200, respectively⁽¹⁾.

When early diagnosed in childhood, diabetes causes significant interventions and changes in the daily life of the child, especially in their self-care actions, which are mediated by continuous medical guidance, seeking to prevent the risk of acute and chronic complications. Because diabetes is a chronic disease, it will require rethinking and adaptations throughout the development of the individual, and these must be transversal to the child's daily living within the family, school, and social environment, thus bringing repercussions for the quality of life and health promotion^(2,3).

Because type 1 diabetes affects youths and children at school age, monitoring in the school environment becomes relevant, since periodic administration of insulin is necessary for the maintenance of metabolism⁽⁴⁾. It is also proven that the social support network, family affinities, and the trustful relationship with the professionals inserted in their social realities have influence on the behaviors of self-care and self-control, besides increasing the adherence to the treatment, resulting in the improvement of glycemic control⁽⁵⁾.

For being inherently an environment of education, the school is a propitious place to promote the health of students and educational community⁽⁶⁾. Furthermore, as school-age children spend much of their time at school, teachers and other professionals can play a key role in their monitoring⁽⁷⁾. However, it is known that the most frequent school health practices in Brazil are based on the biomedical paradigm, in which the school is only a scenario for the health actions, adopting a passive position in front of the interventions⁽⁶⁾.

Considering the epidemiological context, with an increasing incidence of juvenile diabetes, and given the time devoted to school routine by Brazilian children and adolescents, it is prudent to invest in studies questioning whether professionals in the school environment have enough knowledge to collaborate in the management of the disease, and to favor the metabolic control. Thus, the present study aims to describe the public school professionals' knowledge of the disease, treatment and health complications in people with diabetes mellitus.

METHODS

This is a quantitative, cross-sectional and observational study, with a descriptive approach, conducted in public schools of the city of Natal, Rio Grande do Norte, from September to November 2014. A convenience sampling was adopted, as it would cause the least possible interference in the functioning of the schools. Considering the administrative division of the city into four regions (North, South, East and West), a public school in each region of Natal was randomly selected for inclusion in the survey. In the four schools, there were 80 employees in total and, considering the inclusion criteria, all of them were invited to participate in the research.

As sample inclusion criteria, people should be school employees, have direct contact with students, be aged over 18 years, and have been working for the school for longer than a month. Employees with any kind of cognitive impairment liable to hamper the understanding of the methodology applied were excluded.

At the first meeting, the professionals became aware of the objectives, methodology and confidentiality of the research data. Those who agreed to participate had an interview scheduled for a second meeting. On the scheduled date, after having the

Informed Consent Term signed, trained interviewers applied the research instrument to the participants, in a room reserved for this purpose within the school, in order to preserve the confidentiality of the information.

The research instrument consisted of a structured questionnaire⁽⁸⁾ with 30 open and closed questions addressing information about the employee's identification and their knowledge of the disease, the complications and the care in the management of people with diabetes in cases of hypoglycaemia. In a pilot study, which involved the application of the questionnaire to ten professionals of the school area, who were not participants in the study, the form of content presentation and the language comprehension were evaluated, and subsequent adjustment in relation to the technical terms was conducted in order to facilitate the understanding of the questions.

The interview was held through the reading of the printed questionnaire by the researcher, who filled it and, after application, directed the sealed instrument to a confidential location for data analysis and tabulation by two other researchers, working independently in order to avoid typing errors. A maximum of five employees were interviewed per shift, since there was no time limit for responses.

The information collected was tabulated in a database in Epi Info software version 6.04 for Windows, from which the dependent variable frequency (knowledge of diabetes) was analyzed. From the definition of the independent variables (profession, age, gender), the bivariate analysis was performed with use of the independence test (χ^2). Significance level was set at $p < 0.05$.

The research protocol received approval by the Research Ethics Committee of the Potiguar University of Rio Grande do Norte (UnP) under opinion no. 804606/14.

RESULTS

Among the 50 participants in the research: school A had 15 employees, of which 13 (87%) were interviewed; in school B, of the 25 employees, 14 (56%), agreed to participate; in school C, of the 21 employees, 10 (48%) agreed to participate; as for school D, of the 19 employees, 13 (68%) participated.

The most frequent profession was teacher, totaling 60% (n=25) of the interviewees. The other professions were school principal, assistant principal, coordinator, general services assistant, security guard and food service assistant. Among the professionals, the mean age was 46.1 years (SD=9.7 years), 60% (n=34) were females, and the average time of professional exercise was 18 years (SD=2.7 years).

Table I shows the different answers obtained regarding the professionals' knowledge of the definition and classification of diabetes, evidencing that 62% (n=36) of the interviewees showed some knowledge of the disease, relating it to a pancreas condition or increased glycemia. However, 76% (n=38) were unaware of the disease classification.

Table I - Frequency of answers regarding knowledge of diabetes by public school professionals. Natal, RN, 2014.

Questioning	Pattern of responses	n	%
Do you know what diabetes is?			
Correct	Pancreas problem, does not produce insulin, increased glycemia	16	32
Partially correct	High blood sugar level	20	40
Wrong	Not related to the disease	6	12
Does not know	Does not know	8	16
Do you know the forms of diabetes classification?			
Correct	Type 1, 2, 3 insulin-dependent, gestational	12	24
Incorrect	Not related to the disease	6	12
Does not know	Does not know	32	64

Table II evidences an association between the teaching profession and the self-reported knowledge of diabetes in relation to other school professionals. It is emphasized that variables such as sex and age did not show this association.

Table II - Distribution of public school professionals by self-reported knowledge of diabetes according to independent variables. Natal, RN, 2014.

Variables	Self-reported knowledge of diabetes				p-value (χ^2)
	Yes		No		
Profession	n	%	n	%	
Teachers	24	48	1	2	0.04
Other staff	19	38	6	12	
Sex					
Female	30	60	4	8	0.51
Male	13	26	3	6	
Age (years)					
25 - 45	20	40	3	6	0.86
45 or more	23	46	4	8	

It was also analyzed whether the participants had knowledge of the health complications that the diabetic patient might present, and the results showed that visual problems (n=16), cardiovascular conditions (n=15) and cicatrization issues (n=15) were the most cited ones (Figure 1). However, 32% (n=16) of the respondents did not know how to relate any complications to the health of people with diabetes.

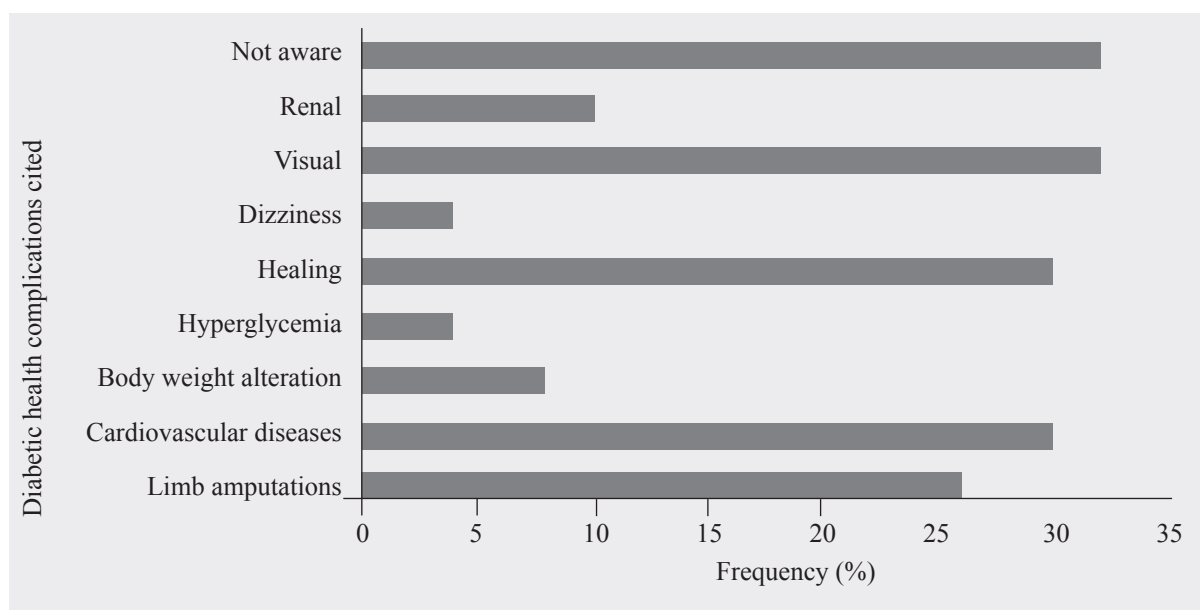


Figure 1 - Frequency of public school professionals' response about diabetes-related health complications. Natal, RN, 2014.

As regards the care that the person with diabetes should take in order to avoid complications to health, 84% (n=42) reported being aware of the recommendations, while 16% (n=8) reported not knowing them. When questioned about what the recommendations are, 86% (n=43) responded correctly or partially correctly, mentioning cautious dietary plan and regular practice of physical activity.

When asked about what a glucose meter is, 60% (n=30) of the respondents reported knowing the usefulness of that device, while 40% (n=20) did not know how to respond. When asked about the normal blood sugar level, 52% (n=26) reported being aware of it, although only 28% (n=14) did answer the question correctly, while 24% (n=12) gave an incorrect answer and 48% (n=24) did not know how to respond.

Given the importance of recognizing the symptoms of the disease, which may contribute to the ability to act before certain situations, the participants were asked about the meaning of hypoglycemia, and 64% (n=32) reported knowing its meaning, but 34% (n=17) reported not being aware of it. When asked about the explanation of what hypoglycemia means, only 38% (n=19) responded correctly by relating it to the low blood glucose level.

As for the interviewee's opinion about the school's concern with regard to the identification of students with diabetes, 12% (n=6) state that the school is concerned about identifying students with this disease, while 88% (n=44) deny that the school is concerned about the identification of those students.

When asked if they knew any student with diabetes at school, 10% (n=5) said yes, but 90% (n=45) were not aware of any student with diabetes at school. Only 8% (n=4) quantified these students in the institution.

It was also questioned whether the school staff was provided training regarding the care and management of students with chronic diseases such as diabetes, and 98% (n=49) said they did not. A total of 94% (n=47) regarded it important for the institution to invest in such training for education professionals, while 6% (n=3) believe that such one should not invest in such training. Among the interviewees, 84% (n=42) showed interest in participating in courses and/or training on the disease.

Considering the importance of having a professional with proper knowledge of the management of the disease, it was questioned whether there was any professional qualified to provide first aid in case of emergency involving students with diabetes and 100% (n=50) of the respondents stated that there was not such professional in the school.

DISCUSSION

In spite of the greater knowledge and advances in the treatment of diabetes, more education is needed for the early diagnosis and better control of all types of this disease, and thus, for prevention of or delay in the long-term health complications, which may compromise quality of life and be among the main causes of death in most countries⁽¹⁾.

In the present study, the professionals of the public school system demonstrated knowledge of the definition of the disease, characterizing it as the absence of insulin in the body and increased glycemia. Similar results were found in a study carried out in Minas Gerais, with teachers of the public school system⁽⁸⁾. Even though a common-sense knowledge about the disease is likely to exist, the information may be incomplete or scientifically unsound⁽⁸⁾, as one can perceive in the present study with regard to the types of diabetes, since the majority of respondents were not aware of the classification.

Since children and adolescents are more affected by type 1 diabetes, knowing the forms of classification of the disease, especially the most frequent ones, is indispensable in order to take better care of the patients. In the context of health promotion, knowledge is an important tool for citizens to be empowered for self-care and decision-making⁽⁸⁾. Therefore, teachers, as facilitators of the construction of knowledge, need to have knowledge of the student's health⁽⁸⁾.

In this perspective, the present study, by assessing the association between the professions and the self-reported knowledge of diabetes, demonstrated association only with the teacher. In the literature, studies⁽⁷⁻⁹⁾ with the same subject matter were restricted to investigating only the teachers' knowledge, probably because of the greater contact between these professionals and the students during the school period.

Knowledge on the part of the teacher is a positive point, but they should not be the only ones involved in the process of promoting health in the school environment. It is recognized that health, as a social production, requires the active participation of all subjects in the construction of actions aimed at providing healthier choices⁽¹⁰⁾. Actually, the group's participation is fundamental at all stages of the work, as it must be accomplished with the community, not for the community, thus enabling the strengthening of its autonomy, as well as recovering values of social awareness, solidarity and fraternity.⁽⁶⁾

In this aspect, the new approaches to health promotion in the school environment are based on the involvement of all the professionals comprised in the school community⁽¹¹⁾, such as the Health-promoting School (HPS) initiative, which is presented as a strategy developed for implementation of health promotion policies⁽¹²⁾. Such initiative is proposed for educational institutions that develop a healthy environment, with constructive and harmonic relationships, being able to awaken in their members abilities and attitudes towards health, promoting autonomy, creativity and participation of the whole school community⁽⁶⁾.

In regard to the knowledge of the complications of the disease, the cardiovascular, visual and hearing issues were the most remembered by the participants of the present study. Knowledge about these complications is important to reinforce the need for the metabolic control of the disease, since people with diabetes are at a higher risk of developing disabling and potentially life-threatening health problems, such as cardiovascular, renal and visual conditions, limb amputations, and neurological impairment⁽¹⁾.

On the treatment of the disease, which is necessary to avoid such complications, the research participants correctly mentioned diet-related care and the practice of physical activities on a regular basis.

Similar results were found by another study carried out with 184 teachers, who emphasized the physical activity and the specific diet plan, along with the drug treatment⁽⁸⁾. The scientific literature demonstrates that several types of physical activity can be performed by people with diabetes mellitus, resulting in psychical benefits, improvement in cardiovascular performance and reduction in risk factors, such as dyslipidemia, hypertension and obesity⁽⁹⁾. The school environment is conducive to the practice of collective activities, which can contribute to the control of the disease.

In a research conducted in the United States, it has been observed that parents of children with diabetes are concerned about the care offered by the school, especially in situations of hypoglycemia and hyperglycemia, figuring that the institution is not able to deal with diabetes⁽¹³⁾. For the reality of the present research, such concern makes sense, since the professionals' knowledge of

the signs, symptoms and values of hypoglycemia is insufficient. Another study, carried out in Brazil, in Minas Gerais, stressed that a potential case of hypoglycemia would not have been recognized by half of the participants, once they demonstrated being unaware of the signs and symptoms presented in such situations⁽⁸⁾. In the state of Ceará, a research with physical education teachers corroborates such evidence by emphasizing a shortage of knowledge on the part of these professionals with regard to the disease and the proper management of people with diabetes, pointing out the need to implement a training program for the employees⁽⁹⁾.

In the current research, it was evident that the teachers investigated were not provided training on the subject. Such absence of teacher's empowerment in dealing with the child with diabetes, while these are under their responsibility in the school environment, creates difficulties and insecurity for this professional, who does not feel able to intervene and provide proper care. On the other hand, the school's inability to handle this situation brings restlessness and apprehension to the family, because they are always wondering what could happen if their child ever needs care during the period they are at school⁽⁸⁾. Thus, it is necessary to invest in health education activities, since the training for the schools professionals is a fundamental tool for the monitoring, care and support to the child in their needs⁽⁹⁾.

In the present study, the non-recognition of students with diabetes by the school staff is evident. This data reinforces the need for communication between the school and the family, which could contribute to the treatment of the disease by reinforcing the health guidelines that are received, inducing greater adherence to both dietary and physical exercise recommendations and to the drug treatment as well⁽¹⁴⁾. Therefore, it is extremely important that the school be able to identify, in order to ensure the student's safety in the school environment⁽¹⁰⁾, not only for those with diabetes, but also with any type of pathology that may require specific care.

The absence of qualified professionals to provide first aid in the event of any urgency involving students with diabetes may pose a risk to their health. This problem has been successfully solved in some countries, such as the United States, Turkey and Sweden, which have implemented diabetes management and prevention programs in the school environment^(7,15,16). It is believed that these trained professionals need not to be inevitably in the health area; they could rather be teachers, managers or support team members who have received training in diabetes care⁽¹⁷⁾. In this perspective, intersectoral actions in Brazil have been implemented in order to favor the promotion, monitoring and maintenance of health in the school environment, for instance, the Health in School Program - HSP (*Programa Saúde na Escola*)⁽¹⁸⁾, even though the early detection and management of diabetes are not listed among the priority actions of this program⁽¹⁸⁾.

It is important to highlight that the current research had as limitation the restricted number of schools. It is suggested that new research on the subject be carried out in order to promote a better understanding of the reality experienced by the students, focusing on training and qualification of the professionals who take responsibility for the individuals' instruction. It is suggested that professionals be trained on adverse situations that might arise in the school environment, as an important step to be taken for early intervention with a view to improving and increasing the quality of care provided to children with diabetes. Thus, the school environment can contribute to the several relational dimensions of the child with diabetes from the first years of life and, in a transversal way, to influence their quality of life and the continuous health promotion in the face of chronic diseases.

CONCLUSION

The knowledge demonstrated by the investigated professionals regarding diabetes mellitus covers the dimensions relating to the definition, complications and forms of treatment. However, it was evidenced that they have less knowledge of care and management of the disease, especially when asked about risk situations such as hypoglycemia and the normal blood glucose level.

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