Prevalence of self-reported morbidity and knowledge about diabetes: population-based study in Southern Brazil

Prevalência de autorrelato da morbidade e conhecimento sobre diabetes: estudo populacional de uma cidade no sul do Brasil

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Abstract – The aim of the present study was to evaluate the knowledge about diabetes and the prevalence of self-reported diabetes in the city of Pelotas, Brazil. A population-based cross-sectional study was carried out including 972 subjects aged from 20 to 69 years. The prevalence of self-reported diabetes was 5.3% (95% CI: 3.9% – 6.7%). Most individuals (73.4%) considered that physical exercise is beneficial for diabetic patients. Approximately 90% of the sample correctly identified the characteristics of diabetes, and greater knowledge was observed among those aged 20 to 49 years and from high socioeconomic status. More than half of the sample (54.9%) correctly identified the risk factors for diabetes and greater knowledge was observed among females and subjects from high socioeconomic level. Knowledge on diabetes seems to be widespread among the population, although it is marked, mainly, by socioeconomic differences. Government health promotion strategies are urgent to raise awareness about this morbidity in the population.

Key words: Diabetes mellitus; Knowledge; Population; Prevalence.

Resumo – *O objetivo do presente estudo foi avaliar o conhecimento sobre diabetes e a prevalência de autorrelato da morbidade na cidade de Pelotas-RS. Foi realizado um estudo transversal de base populacional com amostragem por conglomerados, no qual foram entrevistados 972 indivíduos de 20 a 69 anos de idade. A prevalência de autorrelato de diabetes foi de 5,3% (IC 95%: 3,9% – 6,7%). A maioria dos entrevistados (73,4%) considera que o exercício físico faz bem para indivíduos diabéticos. Aproximadamente, 90% da amostra conseguiu identificar corretamente o que é diabetes, sendo que os maiores conhecimentos foram entre as pessoas de 20 e 49 anos e de maior nível econômico. Mais da metade das pessoas (54,9%) responderam corretamente os fatores associados ao diabetes, sendo que as mulheres e os indivíduos de maior nível econômico demonstraram possuir maior conhecimento. O entendimento sobre o que é diabetes parece estar bem difundido na população estudada. A identificação dos fatores associados ao diabetes é marcada, principalmente, por diferenças socioeconômicas. Políticas públicas são indispensáveis para aumentar o conhecimento visando diminuir a prevalência desta morbidade na população.*

Palavras-chave: *Conhecimento; Diabetes melittus; População; Prevalência.*

INTRODUCTION

Diabetes is one of the most serious chronic degenerative diseases affecting the population, and it is estimated that its prevalence will rise over the years[1].

According to the World Health Organization (WHO), currently, this disease affects about 171 million people worldwide and by 2030 this number may reach 366 million[1]. In Brazil, according to the Telephone Survey Surveillance System for Risk and Protective Factors for Chronic Diseases (Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico, VIGITEL), around 5.6% of women and 4.6% of men aged 18 or older reported medical diagnosis of this disease[2].

Currently, a major challenge for health promotion is the connection among the various areas of knowledge. Such association would enable, through the sum of efforts, the expansion of the health education process, making knowledge more accessible to people, so that they can learn about aspects that contribute to improve their health.

It has been verified, presently, that some forms of media have provided a series of information in terms of health, but this does not mean that populations are modifying their behavior, because this aspect, partly modifiable by the individual, is not synonymous with change of attitude. However, to improve the level of knowledge of the population on the mechanisms of protection and worsening of the illness, there must be a commitment of the entire society, including the government.

Recently, the assessment of the level of knowledge of the population has received special attention[3-5], even though most studies have been conducted in selected populations[1,6]. There seems to be a gap in Brazilian epidemiology concerning the assessment of such aspects in the general population.

The aim of the present study was to identify the prevalence of self-reported diabetes and related indicators of knowledge regarding the risk factors for morbidity, in an adult population from Southern, Brazil.

METHODS

We conducted a population-based cross-sectional study including 972 individuals, aged from 20 to 69 years, in the urban area of the city of Pelotas, Southern Brazil. The Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística - IBGE) divides this city into 404 censor sectors. Each sector has, in average, 300 households. Among these sectors, 40 were drawn for the study. After the determination of the starting point in each of the sectors, where the first randomly selected house was included in the sample, there was a systematic interval of seven households until the next and so on, until the number of 15 households was hit in each census sector. In total, we selected 600 households, in which all residents aged between 20 and 69 years were, initially, considered eligible for the study. People with severe mental disabilities, that would prevent them from answering the questionnaire, were excluded from the study.

Interviewers were people from both sexes with, at least, 18 years old and complete secondary education. They received a 40-hour training, in which practical situations were simulated in a sector that was not included in the final sample. The fieldwork supervisors reviewed all questionnaires during data collection, and they kept weekly contacts with their interviewers, in order to solve possible problems found in the fieldwork.

To investigate demographic and socioeconomic characteristics, a standard questionnaire was used. The independent variables analyzed were: sex and skin color (both observed by the interviewer), age (categorized in decades), level of physical activity (assessed by the leisure section of the International Physical Activity Questionnaire– IPAQ[7] - long version, which considered active people, those who had 150 minutes of physical activity per week at leisure-time, and inactive, those who stayed under this value[8]) and socioeconomic status, based on the Criterion of Economic Classification of the Brazilian Association of Research Companies (Associação Brasileira de Empresas de Pesquisa – ABEP)[9], being divided into four categories: A, B, C and D/E, which were pooled for analysis.

To identify the prevalence of diabetes and knowledge about this disease, the following questions were used: *"Do you have diabetes, blood sugar?"* and *"Do you know what is diabetes?"* and the options of answer to the last question were read to the interviewee (*"Excess blood sugar"; "High blood pressure", "Lack of blood sugar"; "Other" and "Don't know"*) and the correct answer expected was *"excess blood sugar"*. In case the respondent provided a broader notion of the disease, if correct, it would also fit in this option. The intention of this question was to identify those individuals with an approximate idea of what diabetes is.

To assess the perceptions of adults about the role of physical exercise in the prevention and treatment of diabetes, the following question was made: *"How do you view the effect of physical exercise for diabetic individuals?"* The interviewer read the following response options: *"it is good, it is bad and it does not interfere"*. Also to assess the knowledge of the population, individuals were asked about potential factors associated to diabetes, by means of the question: *"Among the factors that I will read, indicate which do you believe are associated with diabetes:"* The following factors were read: *"A) close relative with diabetes; B) obesity; C) diet; D) smoking and E) lack of physical activity"*. The respondent could answer *yes* (it is associated) or *no* (it is not associated). For the operational definition of the outcome, individuals who mentioned, at least, four out the five factors cited above were classified as having high knowledge.

The supervisors performed a quality control in 25% of interviews. Data were entered twice in Epi-Info 6.0 (Centers for Disease Control and Prevention, Atlanta, United States) and the statistical analyses were performed with the software Stata 9.0 (Stata Corp. College Station, United States).

Statistical analysis contemplated a descriptive analysis of the independent variables and outcomes under study and the confidence intervals. We performed bivariate analysis between knowledge of diabetes and independent variables through the chi-square test for heterogeneity. It was also investigated the association between knowledge of the risk factors and

exposure to them. This testing was performed in crude and multivariable analysis using Poisson regression for binary outcomes with high prevalence[10]. All analyses adopted significance level of 5%.

The project was approved by the Research Ethics Committee of Physical Education School of Universidade Federal de Pelotas (protocol number 005/2008). Data were collected only after consent of the subjects.

RESULTS

Out of 600 households previously selected for the study, there were interviews in 514, totaling 1,062 eligible individuals. Among the households in which there was no interview, about half was due to lack of inhabitants in the age group of the study and the other half for refusal to participate. In total, 972 people were interviewed, representing a rate of 8.5% of losses and refusals.

The prevalence of reported diabetes was of 5.3% (95% CI: 3.9 – 6.7), with no difference according to sex (p value= 0.15). Most adults sampled (73.4%) considered that physical exercise is good for diabetic individuals, 22.5% considered that this behavior does not interfere with the disease, and 4.0% considered that physical exercise is bad.

Knowledge of adults to correctly identify the disease was 89.0% (95% CI: 87.0 – 91.0). Table 1 shows the percentage of knowledge according to independent variables. Adults between 20 and 49 years and individuals of high socioeconomic status (A and B) presented the highest prevalence of knowledge.

Table 1. Prevalence of knowledge on diabetes according to independent variables in 972 adults from Pelotas, state of Rio Grande do Sul, Brazil.

Variable	Total N	Knowledge on diabetes (N and %)	P value[#]
Sex			0.7
Male	418	370 (88.5)	
Female	554	495 (89.4)	
Age (years)			0.02
20-29	254	237 (93.3)	
30-39	195	170 (87.2)	
40-49	247	224 (90.7)	
50-59	173	145 (83.8)	
60 or more	103	89 (86.4)	
Economic Level			<0.001
A (highest)	84	80 (95.2)	
B	298	289 (97.0)	
C	395	346 (87.6)	
D/E (lowest)	175	141 (80.6)	
Leisure-time PA[*]			0.8
Inactive	676	603 (89.2)	
Active	292	259 (88.7)	

* Leisure-time physical activity # Chi-square test for heterogeneity

High knowledge about factors associated to diabetes was of 54.9% (95% CI 51.7 – 58.0). Table 2 shows the prevalence of knowledge about the associated fac-

tors, according to independent variables. For all associations, we presented only the prevalence ratio and p value of the crude analysis, data in which there were no significant changes to the adjusted analysis. Females are more knowledgeable of the factors associated with diabetes. Adults in level A economic status had 62% higher knowledge than their peers in levels D/E. Knowledge did not vary significantly in age groups, neither according the physical activity patterns.

Table 2. Knowledge on the factors associated to diabetes and prevalence ratio, according to independent variables in 972 adults in Pelotas, Southern Brazil.

Variables	Knowledge on associated factors to diabetes	Prevalence Ratio (95% CI)	P Value
Sex			0.05
Male	49.5	1.00	
Female	58.8	1.19 (1.00 ; 1.41)	
Economic Level			0.03
A (highest)	71.4	1.62 (1.16 ; 2.27)	
B	59.4	1.35 (1.03 ; 1.76)	
C	53.4	1.21 (0.93 ; 1.58)	
D/E (lowest)	44.0	1.00	
Age (years)			0.55
20-29	50.4	1.00	
30-39	52.3	1.03 (0.80 ; 1.35)	
40-49	59.5	1.18 (0.93 ; 1.50)	
50-59	59.5	1.18 (0.91 ; 1.53)	
60 or more	51.5	1.02 (0.74 ; 1.40)	
Leisure-time PA*			0.80
Yes	56.2	1.00	
No	54.3	0.97 (0.80 ; 1.16)	

* Leisure-time physical activity

Figure 1 shows the percentage of correct knowledge for risk factors associated with diabetes. Knowledge for each risk factor studied was: 85.5% for diet, 76.7% for heredity, 74.9% for obesity, 38.4% for smoking and 65.4% for lack of physical activities.
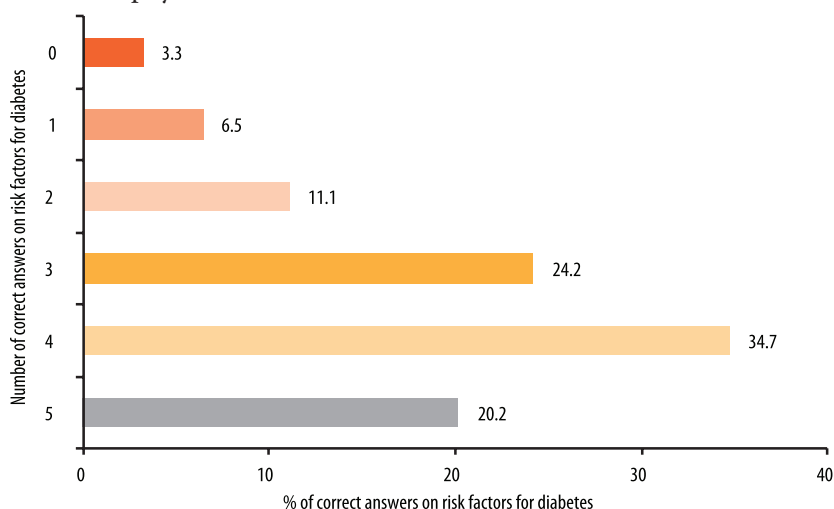

Figure 1. Percentage of correct answers on some risk factors for diabetes in adults from Pelotas.

DISCUSSION

The use of self-report on the presence of diabetes is widely used in epidemiological studies[2,11,12]. It would be ideal if specific tests could be used to confirm the disease, however, such strategy is very difficult from a logistical standpoint, because of the higher costs and technical involvement.

The form of questioning about self-reported morbidity, such as diabetes, usually seeks to mention if any doctor has ever mentioned that the individual has the disease[2]. Even with this approach, without questioning the medical diagnosis, a prevalence of 5.3% was found, rather close to what was found before in this city, 5.6%[11]. The VIGITEL study found prevalence of 5.2% of diabetes in Brazilian capitals. A recent study investigating self-reported gestational diabetes postpartum, found high sensibility and specificity, confirming the validity of using self-report for this disease[13]. In the opinion of the authors, this consistency in prevalence may show a good understanding of the individuals about the issue and this method may be used to monitor secular trends on the disease. For clinical investigations, at the individual level, the confirmation of diagnosis is essential, which differs from the population approach of epidemiological research.

The use of a non-validated questionnaire to assess the knowledge of the population in diabetes could be a limitation in this study. However, there are no investigations testing validation of instruments regarding knowledge, and it would be instigating to define the gold standard in this subject, which is rising in many themes: sexuality, chronic diseases, physical activity. An important strategy would be to develop the questionnaire with more specific questions, as those in the present study may have been too superficial and did not contemplate all the mechanisms causing morbidity or the particularities of each disease type.

It is recommended that the next assessments on health knowledge use broader questionnaires about the outcomes investigated; and the inclusion of a qualitative approach could complement the inherent limitation of this type of research. The use of broader instruments is essential when the intention is to assess knowledge in specific populations.

One of the strengths of this study was the fact that no technical terms were used in any question, always giving priority to the understanding of the questions by any respondent, regardless of his level of education.

There are few studies showing the awareness of the population about the outcome in question[14,15], and most existing studies deals with the subjects already affected by the disease[16,17]. In the present study, individuals were randomly chosen among the general population, minimizing the possibility of selection bias.

Another factor to be considered is that the questions about the risk factors were built without differentiating which type of diabetes these mechanisms would be associated to. It is known that diabetes types I and II, as well as gestational diabetes, have different characteristics, so, it is

understandable that some respondents might have taken into account these differences and this may have influenced some responses.

It was found that 73.4% of respondents believed that physical exercise is good for diabetic individuals. These values were higher than those in the study of Knuth et al.[5], who demonstrated that 53.8% of the general population were aware of the importance of physical activity in the prevention of this morbidity and that 63.1% knew about their effects on treatment. This high percentage can be attributed to increased dissemination of information about physical activity in the media. It would be even better if the actual population of diabetics could identify the beneficial effects of behaviors like diet and physical exercise. However, in Ireland, 258 diabetic patients were interviewed about behavior and cardiovascular complications arising from diabetes. Less than half the patients were able to identify the role of diet and physical exercise in reducing the risk of cardiovascular events[18]. An Asian study with 5,114 adults, with type II diabetes, also found low understanding regarding diet and self-care[16].

Regarding knowledge about risk factors for diabetes, over 85% of the population identified diet; approximately 75%, heredity and obesity; and almost 66%, lack of physical activity. Lower rates of correct answers were found for smoking: 38.4%. Similar prevalence was found in the association with diet and smoking in a recent study[3]. As for the lack of physical activity, we found higher values than those in the studies of Borges et al.[3] and Domingues et al.[4]. These findings may be due to variation in the formatting of the questions. The present study focused primarily on the knowledge about diabetes, unlike the previous studies, which focused on the knowledge of the population about health in general. A high prevalence of correct answers was found in the association between heredity as a risk factor for diabetes (over 75%). This relationship is very consistent in literature and seems to be already disseminated in the population in general[19,20]. There was a low prevalence of knowledge about the association between smoking and diabetes, which can be explained by the poor media disclosure of this relationship[21].

One of the most important findings of this study was the inverse relationship between knowledge and economic level. These results confirm the trend described in a previous study performed in the same city[5]. An Australian study, assessing the understanding of pregnant women from different ethnicities about gestational diabetes, found that high level of education was a determining factor for greater understanding of the disease[22]. As already discussed, the change in behavior is determined, partly, by knowledge of the individuals. A much broader change is required in order to establish a scenario that favors health; and, undoubtedly, health education, alone, will not change the logic of the above findings. Intersectoral action, understanding of the combined social determinants of health, and specific strategies on aspects in this area can reduce the inequalities that affect it. The National Commission on Social Determinants of Health (Comissão Nacional sobre Determinantes Sociais de Saúde, CNDSS) is

aware of this issue, declaring that the inequalities in health information are especially serious, because while they reinforce the exclusion, they generate and increase inequalities[23].

Studies in different states of Brazil would be essential to establish a diagnosis of knowledge on health in the country as a whole. Based on characteristics of great size and inequalities, this parameter could not only interfere with the understanding of the policies around the health sector, but also with other issues, such as education. For people to learn more about health and the mechanisms to improve it, it is essential that efforts on health education be grounded in deeper changes, which go beyond the scope normally designated to the health sector.

CONCLUSION

In summary, the prevalence of self-reported diabetes in this population was similar to that in previous studies. The knowledge of what is diabetes appears to be widespread in the population studied. The identification of the factors associated with diabetes is marked, particularly, by socioeconomic differences.

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