



ORIGINALES

Risk screening for Diabetes Mellitus development in users of Basic Health Care

Rastreamento do risco para desenvolvimento do Diabetes Mellitus em usuários da Atenção Básica de Saúde

Identificación del riesgo para el desarrollo de la Diabetes Mellitus en usuarios de Atención Básica de Salud

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ABSTRACT:

Objective: To identify the risk for the development of type 2 diabetes mellitus in users of the basic health care network.

Method: A cross-sectional, descriptive study with a quantitative approach, consisting of 266 users enrolled in family health units, two instruments were used. The first, a questionnaire composed of sociodemographic variables: sex, age, marital status, schooling. The second, the Finnish Diabetes Risk Score scale. For analysis, inferential statistics were used, with the calculation of crude prevalence ratios with 95% confidence interval.

Results: Low risk was found in 43 (16.2%) of the interviewees and the very high risk found in 4 (1.5%). The majority of the participants presented a slightly elevated risk 83 (31.2%). There was a statistically significant association in the prevalence of risk factors: increased age, overweight, obesity, increased abdominal circumference, physical inactivity, unusual intake of vegetables and fruits, use of hypertension medication, personal history of hyperglycemia and family history of type diabetes mellitus 2.

Conclusion: The study showed that all the investigators presented some risk for the development of type 2 diabetes mellitus and that several risk factors were present in them, thus justifying the importance of screening as a preventive action.

Keywords: Nursing; Diabetes Mellitus; Diabetes Mellitus Type 2; Risk Factors; Primary Health Care; Public Health.

RESUMO:

Objetivo: Identificar o risco para o desenvolvimento do diabetes mellitus tipo 2 em usuários da rede de atenção básica de saúde.

Método: Estudo transversal, descritivo, com abordagem quantitativa, constituído por 266 usuários cadastrados em unidades de saúde da família, foram utilizados dois instrumentos. O primeiro, questionário composto por variáveis sociodemográficas: sexo, idade, estado civil, escolaridade. O segundo, a escala *Finnish Diabetes Risk Score*. Para análise, foi utilizada a estatística inferencial, com o cálculo das razões de prevalências brutas com intervalo de confiança de 95%.

Resultados: O risco baixo foi encontrado em 43 (16,2%) dos entrevistados e o risco muito alto encontrado em 4 (1,5%). A maioria dos participantes apresentaram risco discretamente elevado 83 (31,2%). Houve associação estatisticamente significativa nas prevalências dos fatores de risco: idade aumentada, sobrepeso, obesidade, circunferência abdominal aumentada, inatividade física, ingestão não habitual de legumes e frutas, uso de medicação para hipertensão, antecedentes pessoais de hiperglicemia e histórico familiar de diabetes mellitus tipo 2.

Conclusão: O estudo mostrou que todos os investigados apresentaram algum risco para desenvolvimento do diabetes mellitus tipo 2 e que vários fatores de risco estiveram presentes nos mesmos, assim, justificar-se a importância do rastreamento como uma ação preventiva.

Palavras-chave: Enfermagem; Diabetes Mellitus; Diabetes Mellitus Tipo II; Fatores de Risco; Atenção Primária à Saúde; Saúde Pública.

RESUMEN:

Objetivo: Identificar el riesgo para el desarrollo de la diabetes mellitus tipo 2 en los usuarios de la red de atención primaria de salud.

Método: Estudio transversal, descriptivo, con abordaje cuantitativo, constituido por 266 usuarios registrados en unidades de salud de la familia. Se utilizaron dos instrumentos. El primero, cuestionario compuesto por variables sociodemográficas: sexo, edad, estado civil, escolaridad. El segundo, la escala *Finnish Diabetes Risk Score*. Para el análisis, se utilizó la estadística inferencial, con el cálculo de las razones de prevalencias brutas con intervalo de confianza del 95%.

Resultados: El riesgo bajo se encontró en 43 (16,2%) de los entrevistados y el riesgo muy alto encontrado en 4 (1,5%). La mayoría de los participantes presentaron un riesgo discretamente elevado 83 (31,2%). Se ha observado asociación estadísticamente significativa en las prevalencias de los factores de riesgo: edad aumentada, sobrepeso, obesidad, circunferencia abdominal aumentada, inactividad física, ingesta no habitual de legumbres y frutas, uso de medicación para hipertensión, antecedentes personales de hiperglucemia e historial familiar de diabetes mellitus tipo 2.

Conclusión: El estudio mostró que todos los investigadores presentaron algún riesgo para el desarrollo de la diabetes mellitus tipo 2 y que varios factores de riesgo estuvieron presentes en los mismos, así pues, justificar la importancia de la identificación como una acción preventiva..

Palabras clave: Enfermería; Diabetes Mellitus; Diabetes Mellitus Tipo 2; Factores de Riesgo; Atención Primaria de Salud; Salud Pública.

INTRODUCTION

Diabetes Mellitus (DM) is characterized by metabolic changes that cause glycemic increase, resulting in changes in insulin function and / or secretion. DM is divided into type 1 (DM1) and type 2 (DM2) diabetes mellitus. Type 1, due to the destruction of pancreatic beta cells, generating an absolute or relative insulin deficiency, its etiology may be related to autoimmune or idiopathic causes. DM2 presents in 90 to 95% of the cases, and has as characteristics defects in the action and secretion of insulin, being hyperosmolar hyperglycemic non-ketone syndrome more common in these cases.

There are no specific indicators for DM2, which may result in a strong genetic predisposition for its development in conjunction with environmental interactions^(1,2).

Several studies point to DM2 as a serious public health problem that deserves a great deal of attention from the government, and it is necessary to implement efficient policies and interventions that act on the risk factors that facilitate the development of the disease, in addition, support to the diabetic should be reinforced in order to reduce the possibility of complications related to the lack of control of the disease⁽³⁻⁵⁾.

A prevention of DM2 should be based on interventions that include diet and exercise, aimed at combating overweight, especially those who already know a decreased tolerance in glucose⁽²⁾.

Health professionals who care for users with DM2 risk factors should perform actions to promote DM2 related health, and the nurse through health education should be aware of food, lifestyle and physical exercise as strengthensors for protection development of DM⁽⁶⁾.

It is quite true that scales that can identify subjects at risk or with undiagnosed DM2 can facilitate the recruitment of these individuals for referral to health services for follow-up consultations, and thus are widely applied worldwide in several surveys^(7,8).

In the present study the *Finnish Diabetes Risk Score* (FINDRISC), which was developed in Finland, is used as a simple, fast and effective application that determines the risk for the development of DM2 over the next 10 years⁽³⁾.

Considering the importance of a screening for the risk of DM2 as a subsidy for preventive and guiding actions for health professionals working in the care of the population at risk of developing the disease, the present study aimed to identify the risk for the development of type 2 diabetes mellitus in users of the basic health care network.

METHOD

A cross-sectional, descriptive study with a quantitative approach performed with users of Family Health Units (*USFs*) in the city of João Pessoa, Paraíba, Brazil.

To obtain the sample was taken into account the following inclusion criteria: be registered in *USFs* have between 20 and 59 years old and agree to participate in the study. The following were excluded: pregnant women, participants who had difficulties in understanding the questionnaire, individuals residing in the rural area and those who had a confirmed diagnosis of diabetes mellitus.

The sample was non-probabilistic, for convenience, where the individual who attended the *USF*, due to free demand or to seek some routine care, registered in the respective unit, was invited by the researcher to participate in the study.

To determine the sample size, the significance level α of 5% was assumed. The sample error, which represents the difference between the sample result and the true population result, was also set at 6%. According to data from the Brazilian Institute of Statistical Geography (IBGE), the proportion of individuals in the year 2014 aged between 20 and 59 years was 56%, excluding the prevalence of diabetes mellitus, according to data from the surveillance of risk factors and protection for chronic diseases by telephone survey (VIGITEL) in 2014 was 6.9%, in the interest category of the study, thus considering the prevalence of 52.3%⁽⁹⁾.

District III, which comprises the study population, is divided into 50 health units, representing a total of 201,951 registered people. The study's target population is

comprised of people enrolled in District III family health units aged 20-59 years who do not have diabetes mellitus, representing 134,091 people.

The sample size n was calculated by:

$$n = \frac{N \cdot p \cdot q \cdot \left(\frac{Z_{\alpha}}{2}\right)^2}{p \cdot q \cdot \left(\frac{Z_{\alpha}}{2}\right)^2 + (N - 1)E^2} = \frac{134.091 \cdot 0,523 \cdot (1 - 0,523) \cdot (1,96)^2}{0,523 \cdot (1 - 0,523) \cdot (1,96)^2 + (134.091 - 1) \cdot 0,06^2} = 265,7$$

In that, N is the population size, p is the prevalence of persons aged between 20 and 59 years and who are not carriers of Diabetes Mellitus, $Z_{\frac{\alpha}{2}}$ refers to the accumulated value according to the normal distribution table that considers the level of significance adopted, in the study it was represented by 5% and, E is the sample error adopted that, in the study, corresponded to 6%. Through the calculation, a sample composed of 266 people was reached.

The selection of the participants was composed of two stages. In the first stage, the Health Units of the Sanitary District III that composed the research site were randomly selected. In the second stage, the number of users to be collected from each of the selected units was determined. Thus, 266 people were divided into 21 health units.

For the data collection, a training was carried out on the research instruments, with a workload of 16 hours, with the field researchers: two undergraduate students in nursing and one student of the master's degree in nursing. In this training, the research project was discussed, the instrument used to collect data and given a class on the risk factors for the development of type 2 diabetes mellitus.

The first, a questionnaire composed of sociodemographic variables: gender, age, marital status, schooling. The second, *Finnish Diabetes Risk Score* (FINDRISC), developed in Finland, is a fast, non-invasive procedure to determine the risk of developing DM2 over the next 10 years⁽¹⁰⁾.

It is not a validated instrument for Brazil so far, but it is widely used in other researches of brazilian studies^(4,6,9,11-13). The original instrument was translated by the *State Reference Center for Diabetes Care and Endocrinology of Bahia*⁽⁶⁾.

The instrument is composed of eight variables, being age (<45 years, 45-54 years, 55-64 years or > 64 years), abdominal circumference (<94 cm, 94-102 cm or > 102 cm for men, and <80 cm, 80-88 cm or > 88 cm for women), body mass index (<25, 25-30 or > 30), physical activity practice (at least 30 minutes: yes or no), consumption pattern (regularity of vegetable and / or fruit intake: every day or sometimes), use of antihypertensives (yes or no), family history of diabetes (no, yes: grandparents, uncles or cousins or yes: parents, siblings or children) and history of high blood glucose.

Each FINDRISC variable is composed of a score. The sum generates a score with a possible magnitude of 0 to 24. The scores are categorized in accordance with the risk for developing type 2 diabetes in low risk (<7 points), slightly high (between 7 and 11 points), moderate (between 12 and 14 points), high (between 15 and 20 points), and very high (more than 20 points)⁽⁵⁾.

For data collection, a digital scale with a capacity of 150 kg and a precision of 0.1 kg was used to measure the weight and an inelastic tape measure fixed to the wall, with a maximum length of 2 meters for height. Users were instructed to remove the shoes, stand erect, immobile, with hands flat on the thighs and head adjusted to the *Frankfurt* plane. The abdominal circumference was measured with an inelastic tape measure

placed on the skin at the midpoint between the last rib and the upper border of the iliac crest at the end of the expiratory movement ⁽⁶⁾.

The data obtained were organized into a Microsoft Excel spreadsheet by double typing and later validation in order to control possible errors and exported to *Statistical Package for Social Science* (SPSS) software, version 20.0. For the presentation and analysis of the results, descriptive statistics were used to calculate the frequency, in absolute number and percentage.

For the analysis of the results was considered: physical inactivity, understood as the practice of physical exercises with a time less than 30 minutes daily and at a frequency less than 5 times a week; excess weight (overweight, with Body Mass Index - BMI - between 25.0 and 29.9 kg / m², and obese, with BMI higher than 30kg / m²)⁽¹¹⁾. The BMI is obtained by dividing the weight, in kilograms, by the height in meters, squared); central obesity (Abdominal Circumference - AC - greater than 94 to 102cm in men and greater than 80 to 88 in women) ⁽⁶⁾; The glycemia value was self-reported by the participants, being verified from the consultation to the laboratory exams of the last six months inserted in the medical records. In this study, it was considered the plasma glucose of altered fasting higher 100 mg / dl) ⁽¹⁾.

Subsequently, FINDRISC was categorized dichotomously to facilitate the interpretation of the results by <15 points and ≥ 15 points, as proposed by other authors, representing, respectively, low to moderate risk and high to very high risk. In order to compare the characteristics associated to this outcome, inferential statistics were used, with the calculation of crude prevalence ratios (PR) with Confidence Interval of 95% (CI) ^(6,10,14).

The study considered all the ethical precepts of Resolution 466/2012 and was approved by the Research Ethics Committee (CEP) of the Health Sciences Center, of the Federal University of Paraíba- UFPB, Brazil, under Protocol nº 013/16. CAEE: 52727916.3.0000.5188 and all participants signed the Informed Free Consent Term in two copies.

RESULTS

The sociodemographic characteristics of the 266 study participants are described in (Table 1). The data show that, the majority of the people were female 221 (83.1%), less than 45 years 158 (59.4%), attended high school 111 (42%) and single / divorced / widowed / separated 144 (54.1%).

Table 1 - Distribution of the users in the Family Health Units according to sociodemographic characteristics. João Pessoa, PB, Brazil, 2016.

Variáveis	N	%
Gender		
Female	221	83,1
Male	45	16,9
Age		
<45	158	59,4
45 a 54	76	28,5
55 a 59	32	12,2
Scholarity		
Illiterate/Literate/ Elementary incomplete	66	25,0

Elementary Complete/High incomplete	51	19,0
High complete	111	42,0
Superior Incomplete/Superior Complete	38	14,0
Marital state		
Single / Divorced / Widowed / Separated	144	54,1
Married / Stable Union	122	45,9

Source: Research data, 2016.

Regarding the stratification of the sample according to the risk of developing DM2, the presence of low risk was found in 43 (16.2%) of the interviewees and the very high risk found in 4 (1.5%). Most of the participants presented a slightly elevated risk 83 (31.2%) as found in (Table 2).

Table 2 - Distribution of the users in the Family Health Units, according to the stratification of the risk for the development of DM2. João Pessoa, PB, Brazil, 2016.

Risk	N	%	p-valor (χ^2)
Low	43	16,2	< 0,001
Slightly high	83	31,2	
Moderate	64	24,1	
High	72	27,1	
Very high	4	1,5	
Total	266	100,0	

Source: Research data, 2016.

There was a statistically significant association in the prevalence of risk factors: increased age BMI between 25 to >30, increased abdominal circumference, physical inactivity, unusual intake of vegetables and fruits, use of hypertension medication, personal history of hyperglycemia and family history of DM2, verified in the Table 3.

Table 3 - Distribution of users according to characteristics of the instrument. João Pessoa, PB, Brazil, 2016.

FINDRISC Variables*	< 15 (n = 190)	< 15 (n = 190)	≥ 15 (n = 76)	≥ 15 (n = 76)	RP†	IC‡ a 95%
	N	%	n	%		
Age						
<45	130	82,3	28	17,7	1	-
45 a 54	46	60,5	30	39,5	1,36	1,12 a 1,65
55 a 59	14	43,8	18	56,2	1,88	1,26 a 2,80
BMI§						
< 25	86	96,6	3	3,4	1	-
25 a 30	71	77,2	21	22,8	1,22	1,11 a 1,41
> 30	33	38,8	52	61,2	2,49	1,90 a 3,26
Abdominal circumference						
H < 94 / M¶ <	59	100,0	0	0,0	1	-

80						
H 94 a 102 / M 80 a 88	57	91,9	5	8,1	1,07	1,01 a 1,16
H > 102 / M¶ > 88	75	51,7	70	48,3	1,90	1,62 a 2,23
Physical activity						
1 = Yes	51	85,0	9	15,0	1	-
2 = No	139	67,5	67	32,5	1,26	1,09 a 1,45
Ingestion of vegetables						
Every day	86	81,1	20	18,9	1	-
Sometimes	104	65,0	56	35,0	1,25	1,08 a 1,44
Medication HAS**						
1 = No	142	84,0	27	16,0	1	-
2 = Yes	48	49,5	49	50,5	1,70	1,37 a 2,10
History of hyperglycemia						
1 = No	168	80,0	42	20,0	1	-
2 = Yes	22	39,3	34	60,7	2,04	1,46 a 2,84
DM family history ††						
1 = No	97	93,3	7	6,7	1	-
2 = Grandparents, uncles, cousins	40	74,1	14	25,9	1,26	1,07 a 1,49
3 = Parent, siblings or children	53	49,1	55	50,9	1,90	1,56 a 2,32

Source: Research data, 2016. * FINDRISC - Finnish Diabetes Risk Score; † RP - Prevalence Ratio; ‡ CI - 95% confidence interval; § IBM - Body Mass Index; || H - Man; ¶ M - Woman; ** HAS - Systemic Arterial Hypertension; †† DM - Diabetes Mellitus.

DISCUSSION

The importance of tracking the risk for DM2 is due to the fact that the prevalence of the disease presents a high morbidity and mortality, which makes it a serious public health problem⁽⁶⁾. In the screen study, a predominance of 83.1% of *USFs* women users was found, this finding is also reflected in a study on risk for DM2 and associated factors in health units with 419 users, of whom 369 were women⁽³⁾. The greater demand for primary health care services by the female sex can be justified by the greater concern about health, which leads to a higher attitude towards self-care⁽¹⁾.

The population of the sample is predominantly young, 59.4% under 45 years of age, although the Ministry of Health points to the risk of DM2 being older than 45 years old, data were found in the literature aimed at the young age group, the present study on investigations for DM2, thus revealing a high risk in this age group⁽¹²⁾. The importance of checking the predominance of risk factors for DM2 in a young population allows the

Health Services to establish strategies to change modifiable risk factors and reduce the prevalence of the disease.

With regard to schooling, a predominance of a population with a complete secondary education of 42% is observed. This result differs from another survey with users of basic care in which, the majority represented by 39.4%, presented incomplete primary education ⁽³⁾. The importance of an increase in schooling is related to a better understanding and awareness of the health and illness process that involves the entire context in which the user is inserted.

Regarding marital status, the majority of participants in the present study were single / divorced / widowed / separated, on the other hand, in a study with USFs users in Ceará, Brazil, 60.4% who are sampled were married or maintained stable union, in that same study there was a statistically significant association with risk for DM2 related to the marital status ($p < 0.001$) ⁽¹¹⁾.

With respect to the 266 study participants, all were classified as one type of risk. Most study participants presented a slightly high risk 31.2%, followed by high 27.1% and 1.5%, with very high risk. These results are similar in other studies that also used the same predictive scale of DM2 risk of the current study, in national and international realities, evidenced in the South of Brazil a discreetly high risk of 35.4%, high of 17.5% and very high 1.1%, and in the Northeast of Portugal a discreetly high risk of 31%, high of 21% and very high of 2% ^(6,10). Participants were informed of the risk according to the score of the instrument and many expressed concern, not believing that they could be at risk of developing DM2.

Regarding the overweight and obese individuals, they were statistically significant PR of 1.22 and PR of 2.49, respectively. Considering the 95% confidence interval, there was a greater probability of developing DM2 with weight gain. In this study it was observed that individuals classified as high and very high risk represented 61.2%, had a BMI greater than 30, and at low to moderate risk 77.2% were overweight. A study aimed to evaluate the risk DM2 in northeastern Brazil with 419 user's health nurse units pointed out that 59.7% were overweight, and 40.8% classified as overweight and 18.9% obese, the same study evaluating the cause and effect of the factors associated with the outcome of DM2 confirmed a higher probability in those users with obesity presenting a PR of 4.20 ⁽¹¹⁾.

Another study, which corroborates the findings of the present study, aimed to measure the incidence of DM2 and risk factors in health workers, was performed in the Northeast of Argentina with 391 workers and pointed out a significant association with the increased risk for DM2 in the classification of overweight and obesity ⁽¹⁵⁾. In VIGITEL, the question of overweight and obesity was evaluated according to the capitals of the Brazilian states. In João Pessoa, overweight represented 51.4% and obesity 16.6% in the general population ⁽⁹⁾.

When it comes to abdominal circumference, it can be observed that, according to the increase of the abdominal perimeter, the probability of risk also increased. In the dichotomous risk classification, it was observed that the majority of the participants had abdominal circumference characterized by central obesity, both low to moderate risk and high to very high risk. However, the low to moderate risk represented the highest percentage for increased waist circumference. The results are consistent with a survey conducted in a region of Europe with primary care users, showing that 42% of the sample had an abdominal perimeter compatible with central obesity ⁽¹⁴⁾. In a study on the screening of risk factors for DM2 in workers in an industry in southern Brazil, it was observed that 100% of the studied sample that was in the high risk and

very high risk range had abdominal circumference above what is recommended by the Ministry of Health ⁽¹³⁾.

Physical inactivity, understood here as the insufficient practice of physical activity as recommended, is associated with a higher probability of developing DM2 with PR of 1.26 in the present study. With regard to dichotomous risk, the majority of participants with physical inactivity were at low to moderate risk. In a study developed in the Northeast of Brazil that aimed to identify the factors associated with DM2, the sample presented 53.7% with physical inactivity ⁽¹¹⁾. In a study of 702 university students evaluating the relation of modifiable risk factors for DM2, it was observed that the sedentary lifestyle was the most prevalent risk factor in the study population ⁽¹⁶⁾. Confirming results in another study conducted in several regions of Brazil, there was insufficient physical inactivity - less than 150 minutes per week in adults - corresponding to 66.6% ⁽¹⁷⁾.

In a study in Azores, Portugal, with 278 users of health units that used the same dichotomized instrument (FINDRISC) presenting the group with high and very high risk of developing diabetes, it was verified that the great factors responsible for this high risk are due to overweight (97%), central obesity (98.5%) and physical inactivity (90.6%) ⁽¹⁰⁾. In the present study, overweight and central obesity were mostly present at low to moderate risk and at high to very high risk, however, physical inactivity was more present in low to moderate risk. These data are of concern, because strong risk factors for the development of DM2 that should be more present in high to very high risk are mostly low to moderate risk, and if interventional measures are not taken risk factors, the low-risk user will quickly be at high risk or a possible confirmed diagnosis of type 2 diabetes mellitus.

In the present study, the daily consumption of fruits and / or vegetables represented 40%, although below ideal, exceeded the national average of Brazil evidenced in VIGITEL, in which the frequency of regular consumption of fruits and vegetables was only 36.5 % ⁽⁹⁾. However, higher frequencies have been identified in a similar study in the Azores, Portugal, with 53% and in a national study in the municipality of Itapipoca, Ceará, Brazil, with users of the family health unit, corresponding to 46.3% of daily consumption of fruits and / or vegetables ^(3,11). Analyzing this fact with the risk of developing DM2, in the present study statistically significant RP data of 1.25 were found with users who did not eat fruits and / or vegetables daily. In another study, no statistically significant association was observed ($p = 0.245$) ⁽¹⁰⁾. With regard to dichotomized risk, most participants with high to very high risk did not consume fruits and vegetables every day, which demonstrates poor eating habits, reinforcing the findings of weight gain and waist circumference. The habit of good feeding practices and the incentive to practice physical exercise should be initiated in childhood, consolidated in adolescence and reinforced in the adult and elderly stages, contributing as protective factors for health.

Regarding the medication for hypertension, the study shows statistically significant results with the probability of risk for DM2 PR of 1.70. On the other hand, the sample with hypertensives was low, can be inferred by the predominance of a population of young adults. In a study of the prevalence and factors that influenced DM2 in South India at the primary care health center with adults over 40 years of age, hypertension was significantly associated with DM2 ⁽¹⁸⁾. In João Pessoa, the medical diagnosis of hypertension was evidenced in 25.5% of the general population, in which it represented 23.6% in men and 27.1% in women ⁽⁹⁾. In a systematic review in Vietnam, it is confirmed that the risk for developing DM2 is higher in hypertensive people, because hypertension is a component of the metabolic syndrome that is related to the

occurrence of DM2 ⁽¹⁹⁾. Regarding the dichotomized risk, 50.5% who were at high to very high risk took medication for hypertension.

Regarding the history of blood glucose change, the on-screen study indicates that 21% of the participants reported an alteration. This result is in line with a study conducted in eastern Espírito Santo, Brazil, which aimed to evaluate the prevalence of risk factors for DM2 with 100 patients from a health clinic, and it was found that 21% of the sample reported a history of change of blood glucose ⁽⁴⁾. In a study to assess risk factors for DM2 in Australians, 32% had a history of altered glucose ⁽²⁰⁾. Regarding the probability of risk, this study noted that even in a small sample of change in blood glucose history, we observed PR 2.04, which shows that factor related to likelihood of risk for DM2. In another study, the altered glucose RP of 4.36, confirmed the greater chances for development of DM2 ⁽³⁾. At high to very high risk, 60.7% reported changes in glycemia.

Regarding the family history of DM2, in our study, 40.6% reported having at least one first-degree relative and 20.3% had a second-degree relative. In a Japanese cohort study of middle-aged adults, 18% of the sample had a family history of DM ⁽²¹⁾. In a study in Amarante, Portugal, with primary care users, 45% of the sample had at least one first or second degree relative diagnosed with DM2 ⁽¹⁴⁾.

Several studies point to family history with risk for DM2 ^(13,15,18,21). In the present study, we found statistically significant data in first degree kin, PR of 1.90, and in second degree kin, PR of 1.26, with probability for DM2. With regard to the dichotomized risk for DM family history, the results show a balance between low / moderate and high / very high risks in parents, siblings and children, which may imply that interventions in the family are necessary that share habits of risk for the occurrence of DM2

Another study in Japan investigating differences in family history of diabetes with DM2 risk emphasized that the maternal history of DM was associated with an increased incidence of DM2 in non-overweight individuals of 2.35, however individuals with overweight, the paternal history of DM was significantly associated with the highest DM2 RP incidence of 1.98, so this Japanese study showed a relation between the hereditary question and the weight, in which the genetic question predominated as a major factor of risk in relation to living habits ⁽²²⁾. In the present research, this relationship of the Japanese article has not been investigated, in the future it may be important to know these nuances related to heredity and weight.

The limits of the study were the transversal design that does not allow the establishment of cause and effect relationships, the use of an instrument not validated for Brazil and the non-probabilistic sample. The greatest difficulties encountered were the location of health units that were distant from each other, some in areas at risk due to increased crime and access to male users who, in addition to being few service visitors, refused to participate in the survey.

On the other hand, the implication for nursing refers to encouraging the use of the instrument in basic health care by the nurse as a preventive measure for DM2 and empowering the user about their risk which may encourage them to make better decisions with regard to behavior and health care.

CONCLUSION

The results of the research showed that all the subjects investigated revealed to present some risk for the development of DM2 and that several risk factors were present in the study population, most of which are modifiable. Thus, the importance of

screening as a preventive action is justified. Another relevant aspect is the occurrence of these factors predominantly in a young adult population, which demonstrates the need for prophylactic actions for DM2, which should include the follow-up of the person in the health service, the creation of the link between professional / user, about their risk and interventions through health policies, helping to reduce the risk factors in the target audience.

The use of the FINDRISC scale in basic health care is a practical, useful and efficient tool that, if used by health professionals, especially nurses, will facilitate the detection of individuals at risk and the implementation of early preventive measures. The research recommends the use of the scale in basic health care, mainly by the nurse as a prevention tool for the development of DM2.

It has been found statistically significant association between risk for developing DM2 and clinical variables body mass index, increased abdominal girth, physical inactivity, diet, use of antihypertensive medication, glucose history changed and family history of DM and age sociodemographic variable advanced.

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