Revista Brasileira em Promoção da Saúde

e-ISSN:1806-1230

Original Article

DOI: 10.5020/18061230.2017.6118

FINDRISK: DIABETES MELLITUS RISK STRATIFICATION IN COMMUNITY HEALTH

FINDRISK: estratificação do risco para Diabetes Mellitus na saúde coletiva

FINDRISK: estratificación del riesgo de Diabetes Mellitus en salud colectiva

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ABSTRACT

Objective: To analyze the importance of FINDRISK in type 2 Diabetes Mellitus (DM) risk stratification as a preventive strategy in community health. **Methods**: A descriptive, analytical and epidemiological study, carried out with 371 people, aged 30-69 years, conducted between August 2015 and March 2016 in the Brazilian Northeast. The tool FINDRISK was used for data collection by means of inferential statistics analysis, with prevalence ratios calculation at the significance level of 5%. **Results**: Of the subjects, 85.7% (n=318) presented no/low/moderate risk of DM2, 66.8 % (n=248) were females, 59% (n=218) aged over 45 years, 72% (n=267) had high BMI, 77% (n=284) had increased waist circumference, 54% (n=202) practiced physical activity, 67% (n=250) did not eat vegetables/fruits, 80% (n=297) did not have high blood glucose, and 52% (n=194) had family history of DM. **Conclusion**: The questionnaire proved to be an important tool for DM2 risk stratification, and a potential inducer in the planning of health prevention and promotion actions, according to the severity level.

Descriptors: Diabetes Mellitus; Risk Factors; Health Promotion.

RESUMO

***Objetivo**: Analisar a importância do FINDRISK para a estratificação do risco em Diabetes Mellitus (DM) tipo 2 como estratégia preventiva na saúde coletiva. **Métodos:** Estudo epidemiológico, descritivo e analítico, realizado com 371 pessoas, com idade entre 30 e 69 anos, desenvolvido entre agosto 2015 e março de 2016 no Nordeste brasileiro. Aplicou-se o instrumento FINDRISK para coleta de dados por meio da análise estatística inferencial, com cálculo das razões de prevalência ao nível de significância de 5%. **Resultados:** Dos sujeitos, 85,7% (n=318) apresentaram nenhum/baixo/moderado risco de DM2, sendo 66,8% (n=248) do sexo feminino, 59% (n=218) com idade superior a 45 anos, 72% (n=267) com índice de massa corporal elevado, 77% (n=284) com circunferência abdominal aumentada, 54% (n=202) praticavam atividade física, 67% (n=250) não comiam verduras/frutas, 80% (n=297) não tinham glicose elevada e 52% (n=194) apresentavam familiar com DM. **Conclusão:** O questionário apresentou-se como um importante instrumento para estratificar o risco para DM2, além de potencialmente indutor no planejamento de ações de prevenção e da promoção da saúde conforme o nível de gravidade.*

***Descritores:** Diabetes Mellitus; Fatores de Risco; Promoção da Saúde.*

Received on: *01/23/2017*
Revised on: *05/24/2017*
Accepted on: *06/22/2017*

RESUMEN

***Objetivo**: Analizar la importancia del FINDRISK para la estratificación del riesgo de Diabetes Mellitus (DM) tipo 2 como estrategia de prevención en salud colectiva. **Métodos:** Estudio epidemiológico, descriptivo y analítico realizado con 371 personas con edad entre los 30 y 69 años desarrollado entre agosto 2015 y marzo de 2016 en el Noreste brasileño. Se aplicó el instrumento FINDRISK para la recogida de datos a través del análisis estadístico inferencial con el cálculo de las razones de prevalencia y el nivel de significación del 5%. **Resultados:** Entre los sujetos, el 85,7% (n=318) presentaron ningún/bajo/moderado riesgo de DM2, siendo el 66,8% (n=248) del sexo femenino, el 59% (n=218) mayor de 45 años, el 72% (n=267) con el índice de masa corporal elevado, el 77% (n=284) con la circunferencia abdominal aumentada, el 54% (n=202) practicaban actividad física, el 67% (n=250) no comían verduras/frutas, el 80% (n=297) no tenían la glucosa elevada y el 52% (n=194) tenía algún familiar con DM. **Conclusión:** El cuestionario se presentó como un instrumento importante para la estratificación del riesgo de DM2 además de ser un potencial inductor para el planeamiento de las acciones de prevención y promoción de la salud según el nivel de gravedad.*

***Descriptores:** Diabetes Mellitus; Factores de Riesgo; Promoción de la Salud.*

INTRODUCTION

Diabetes Mellitus (DM) is the term that describes a metabolic disorder of multiple etiology, characterized by chronic hyperglycemia and disorders in the metabolism of carbohydrates, lipids and proteins, which result from defects in insulin secretion, insulin action or both[1,2]. Type 2 Diabetes Mellitus (DM2) is the most prevalent form of this disorder, accounting for more than 90% of the cases. It is characterized by defects in both insulin action and secretion. Its onset is usually in adults, and it has been related to obesity, physical inactivity and unhealthy eating habits[3].

This is a chronic condition and its prevalence is also related to the age, sedentary lifestyle and the stress of urban life[4]. Data on its prevalence in nine Brazilian capitals in the late 1980s indicate that, on average, 7.6% of Brazilians aged between 30 and 69 years present DM. Moreover, the incidence increased with age and body adiposity. Those data refer to the cities of São Paulo and Porto Alegre as the ones with the highest rates, suggesting that the urbanization and industrialization are agents that act as determinants in the pathogenesis of DM2 in Brazil[5].

It is necessary to implement effective actions regarding strategies for prevention and health promotion, especially for populations at greater risk of developing the disease. Monitoring the prevalence of risk factors, especially those of behavioral nature, enables the implementation of actions at a lower cost and with greater effectiveness[6].

In this sense, the risk stratification for prediction of DM2 has been developed from classic factors, such as age, sex, obesity, metabolism, lifestyle, family history of DM and ethnicity. Thus, by identifying the etiology, the factors and risk stratification of DM2, respecting the singularity of the individual, it becomes possible to intervene in the factors susceptible to change[7].

Randomized clinical trials using DM2 risk stratification have been developed in China, the United States, India, and countries of the Organization for Economic Cooperation and Development. However, in order to reduce costs, intervention programs were offered directed only at people at high risk[8].

In Brazil, the National Policy on Primary Care (*PNAB - Política Nacional da Atenção Básica*) presents as its structuring axis proposals to change the care model and to reorientate the health practices in the individual and collective scope, with comprehensive care by strategic areas as one of the attributions. Among thesem, health promotion and DM control[9]. The action of health promotion, aimed at the adoption of healthy eating and the practice of physical activity, becomes essential, since the scientific evidence shows that these factors are involved with the development of obesity, diabetes and cardiovascular diseases, as well as cancer, diseases of the oral cavity and osteoporosis[10].

The risk stratification technology is part of the basic macroprocesses advocated for the work in Primary Health Care (PHC), making it possible to identify risk gradients, prioritize situations of greater urgency, and prevent, or else delay, the onset of diseases through the monitoring of the users. In DM2, it makes it possible to subsidize health promotion and prevention actions based on equity and prioritization, suggesting changes in lifestyle[11, 12]. For that, it is necessary to know the internal resources (material, emotional, cultural and values) and the external ones (support networks and databases), the professional context, the work organization, the expected results, the needs to be met, and the performance criteria, among others. Such knowledge may favor the development of a critical awareness and the planning of a program that bears the participation of the team, the patient and their family[13].

The present study aims to analyze the importance of FINDRISK in type 2 Diabetes Mellitus (DM) risk stratification as a preventive strategy in community health.

METHODS

Epidemiological, quantitative, descriptive and analytical study, conducted in the district of Dourados, municipality of Horizonte (Ceará), from August 2015 to March 2016, with a sample of 371 individuals between 30 and 69 years old, of both sexes.

The municipality of Horizonte is located in the Metropolitan Region of Fortaleza[14] and bears a population of approximately 18 thousand families, in a total of almost 56 thousand people. Of these, 1,950 have DM2, of which 1,582 (81%) are undergo monthly follow-up. Dourados is part of the rural area and has 1,578 families with approximately 5,272 people. This district was chosen because it is the area with the largest number of families registered, has the third largest population from 30 to 69 years old (1,420 people) and the second largest number of people with DM (137) registered per Basic Health Unit[15].

The study sample was calculated from the formula indicated for the calculation in cross-sectional studies of finite population[16], considering a 95% confidence coefficient and a sampling error of 5%. This value provided the maximum sample size (325 users) plus 10% in order to avoid possible losses and/or withdrawals, resulting in an initial sample of 358. A further 13 questionnaires were added, totaling 371 participants.

The participants of this research were chosen by means of the "A" form of the Basic Attention Information System (*SIAB - Sistema de Informação da Atenção Básica*). The access to the forms contained in family records was authorized by the Municipal Health Secretary after signature of the consent form. Thus, there was no difficulty in sellecting those born between 1946 and 1985 (30 to 69 years of age). The numbers of the medical records were then entered in the Statistical Package for the Social Sciences (SSPS), version 18.0, and random sampling was used for selection of the participants by domicile, following the criteria of inclusion: being between 30 and 69 years of age and present at the address at the moment of the survey. Exclusion criteria were: having a previous diagnosis of type 1 or 2 DM and/or any condition that might interfere with anthropometric measurements, such as gestation, physical disabilities or bedridden individuals.

For data collection, the study applied the Finnish Diabetes Risk Score (FINDRISK), a Finnish risk score questionnaire widely disseminated through the internet that can be accessed and answered by anyone. This is a practical screening tool for estimation of the risk of type 2 diabetes and the likelihood of asymptomatic diabetes, without the need for laboratory testing. Validated by the Department of Public Health of the University of Helsinki, in Finland, this questionnaire showed sensitivity of 81% and specificity of 76% for the population of that country. It consists of eight items that encompass information concerning age, blood pressure, body mass index (BMI), waist circumference, physical activity, diet, use of antihypertensive medication, history of high glucose in the blood, and family history of DM.

FINDRISK classifies the risk of developing DM2 within ten years, according to the following standardized scores: ≤ 7 points - low risk (estimated 1 in 100 people will develop the disease); 7 to 11 points - slightly elevated risk (estimated 1 in 25 people will develop the disease); 12 to 14 - moderate risk (estimated 1 in 6 people will develop the disease); 15 to 20 points - high risk (estimated 1 in 3 people will develop the disease); and, for > 20 points, very high risk (estimated 1 in 2 people will develop the disease)[17].

For applicability in Brazil, the instrument was adapted according to the Brazilian culture, but the same type of analysis was maintained. Applied in research carried out by different health areas, such as in obesity, cardiovascular and metabolic diseases, FINDRISK is considered an easy-to-calculate and low-cost instrument[18].

A standard operating procedure (SOP) was created, based on the Anthropometry Manual of the Brazilian Institute of Geography and Statistics[19] for the anthropometric evaluation, which states the objective of standardizing the actions of the community health workers and describes the procedures to be performed, the material used, and the ethical considerations needed during the interview.

For measurement of the participants' weight, height and waist circumference, the study made use of a 0.1-kilogram precision portable digital scale weighing 180 kilograms and a 150-centimeter long inelastic measuring tape of NYSL brand.

The calibration of the instruments to be used was accomplished from the demonstration of the technique for anthropometric measurements (height, weight, waist circumference, use of the scale and measuring tape). The participative methodology called Role playing was adopted, an interactive dynamic that uses the exchange of roles, favoring teaching and learning in different situations, enabling an analysis of the communication process and the factors that hinder or improve the relation between the professional and the patient[20].

The collected data were exported to the SPSS 18.0 software for processing and analysis in a descriptive way, with use of absolute and percentage frequencies. The risk of developing DM2 within 10 years was adopted as the outcome variable: none/low/moderate (<15) and high/very high (≥15). The explanatory variables were distributed as: sociodemographic (male and female sex) and age (≥45 years); lifestyle, i.e., physical activity and fruit and vegetable intake; clinical, i.e., weight and height; normal BMI (<25 kg/m^2) and overweight/obesity (≥25 kg/m^2); normal abdominal circumference, increased risk, or very increased risk; use of antihypertensive medication; history of altered glucose; family history of DM.

The research was developed after analysis and approval by the Research Ethics Committee of the State University of Ceará (UECE) under number 1 206 470.

RESULTS

As can be seen in Table I, the highest prevalences are: 85.7% (n=318) with no/low/moderate risk of developing DM2 within ten years; 66.8% (n=248) of female subjects; 59% (n=218) aged over 45 years, with mean age of 44.4 years (SD±9.7); 72% (n=267) presenting high BMI; 77% (n=284) with increased abdominal circumference; 54% (n=202) practiced physical activity; 67% (n=250) did not eat vegetables and/or fruits regularly; 80% (n=297) did not take antihypertensive drugs; 92% (n=342) had no record of high blood glucose and 52% (n=194) had relatives with type 1 or type 2 DM.

Table I - DM2 risk and sociodemographic, clinical and lifestyle profile according to the number of participants. Horizonte, Ceará, Brazil, 2015.

Variables		n	%
Risk of DM2			
	< 15	318	85.7
	≥ 15	53	14.3
Sex			
	Male	123	33.2
	Female	248	66.8
Age ≥ 45 years			
	Yes	218	59.0
	No	153	41.0
Body mass index			
	Normal	101	27.0
	Overweight	153	42.0
	Obesity	117	31.0
Abdominal circumference			
	Normal	79	22.0
	Increased Risk	78	21.0
	Very High Risk	214	57.0
Practices physical activity			
	Yes	201	54.0
	No	170	46.0
Eats fruits/vegetables daily			
	Yes	122	33.0
	No	249	67.0
Takes antihypertensives			
	Yes	74	20.0
	No	297	80.0
History of altered glucose			
	Yes	29	8.0
	No	342	92.0
Family history of DM2			
	Yes	194	52.0
	No	177	48.0

Associations were made between sociodemographic, clinical and lifestyle variables and the risk of developing DM2 within ten years, which are displayed in Table II.

Table II - Association between sociodemographic, clinical and lifestyle variables according to the risk of developing DM2 within ten years. Horizonte, Ceará, Brazil, 2015.

Variables		Classification of DM2 risk					
			High / Very high		None Low / Moderate		
		Total	n	%	n	%	p
Sex							
	Female	248	45	18.1	203	81.9	0.005
	Male	123	09	7.3	114	92.7	
Age ≥ 45 years							
	Yes	218	35	22.9	118	77.1	< 0.001
	No	153	19	8.7	199	91.3	
BMI							
	Normal < 30	251	22	8.8	229	91.2	< 0.001
	Obesity ≥ 30	120	32	26.7	88	73.3	
Abdominal Circumference							
	Increased	292	53	18.2	239	81.8	< 0.001
	Not increased	79	01	1.3	78	98.7	
Practices physical activity							
	Yes	201	25	12.4	176	87.6	0.209
	No	170	29	17.1	141	82.9	
Eats fruits/vegetables daily							
	Every day	122	16	13.1	106	86.9	0.582
	Not every day	249	38	15.3	211	84.7	
kes antihypertensives							
	Yes	74	32	43.2	42	56.8	< 0.001
	No	297	22	7.4	275	92.6	
History of altered blood glucose							
	Yes	29	17	58.6	12	41.4	< 0.001
	No	342	37	10.8	305	89.2	
Family history of DM2							
	Yes	194	51	26.3	143	73.7	< 0.001
	No	177	03	1.7	174	98.3	

With regard to the participants who presented a high/very high risk of developing DM2 within 10 years, the value was 18.1% (n=45), where 22.9% (n=35) were aged ≥45 years; 26.7% (n=320) presented obesity (BMI ≥30); 18.2% (n=53) had increased abdominal circumference; 17.1% (n=29) did not practice physical activity; 15.3% (n=38) did not eat fruits/vegetables daily; 43.2% (n=32) took antihypertensives; 10.8% (n=37) had no history of altered blood glucose and 26.3% (n=51) had a family history of DM2.

DISCUSSION

The high risk of developing Type 2 Diabetes Mellitus assumes conditions in which the individual is below the pre-diabetes level. In such cases, it is recommended that screening be done in order to become aware of the previous history of the individual. It is also recommended to perform a physical examination, blood pressure test, anthropometric data measurement and BMI calculation. Identifying the risk factors for DM, as well as evaluating the health status and requesting laboratory tests, are considered necessary actions that contribute to the diagnosis and to the therapeutic or preventive decision[21,22].

In regard to the sex variable, this study had 66.8% (n=248) of female subjects. Among them, 18.1% (n=45) had a high/very high risk of developing DM2 within ten years. In contrast, other authors have found different data, in which the majority were male[22,23]. In another study, there was an approximate parity between the sexes[24,25]. There is still no consensus in the studies

on the high prevalence of DM2 according to sex. The explanation for the predominantly female-related findings conveyed by research suggests that the greater participation of women in surveys is due to the fact that they are more concerned about health than men[23,26].

Among the interviewees in the present study, 14.3% (n=53) had high and very high risk (score≥15) of developing DM2 within the next 10 years. In studies carried out in other countries, different results were found as to high risk and very high risk: Spain (19.5%)[27]; Portugal (12.8%)[28.29]; Cuba (10.5%)[30] and Norway (28.5%)[31].

In Brazil, there was higher prevalence of high risk and very high risk (27%) of DM2 in Colantina (Espírito Santo)[32], and the lowest prevalence (3.8%) was found in the city of Tubarão (Santa Catarina)[33]. In the Northeast, studies were carried out in Campina Grande (Paraíba)[34] and Picos (Piauí)[35]; however, these studies did not report the high risk of DM2. In Ceará, in the city of Itapipoca, a study similar to the one carried out in Horizonte was identified, with 11.7% of the participants presenting high risk of DM2[18]. In a study carried out in Fortaleza, researchers determined the frequency of risk factors, but did not determine the prevalence in high/very high risk of developing DM2 within ten years[35,36].

By analyzing the association between the risk of developing DM2 within 10 years and sociodemographic and clinical variables, statistical significance ($p < 0.05$) was found, suggesting that those variables are present in people with high/very high risk of DM2. Statistical significance regarding the same variables is also present in studies conducted in Campina Grande[34], Itapipoca and Fortaleza[37,38]. Other authors have also investigated the same risk factors for DM2, evidencing their prevalences and their statistical significance[32,34].

As to the anthropometric clinical variables of the present study, the BMI values indicate that 42% (n=153) of the interviewees are overweight and 31% (n=117) with obesity, while values of abdominal circumference showed that 57% (n=214) of the participants presented a much increased risk of developing metabolic diseases, such as obesity, DM, hypertension and heart failure. A high prevalence of individuals with DM who were overweight and/or with predominance of increased abdominal circumference was found in epidemiological studies associated with the practice, or not, of physical activity and inadequate diet[4,21,22,38].

This research presented some limitations due to the difficulty accessing the residence of the participants, since primary care professionals do not apply risk stratification within the health unit. Besides these, the non-acceptance in participation presented by some individuals, which demonstrates the uninterest in their own health.

CONCLUSION

The tool has proved to be an important means of risk stratification in the daily routine of family health teams, evidencing the early identification of the risk of developing DM2 within ten years at the primary or secondary level. Consequently, since this is a practical and low-cost tool, it becomes possible to plan and implement actions aimed at health promotion and prevention in the population.

FINDRISK constitutes itself as a soft and useful technology in praxis, making it possible to develop measures from the quantification and grouping of people by the immediate and late need for care, enabling the development of individual and group activities aimed at preventing, or delaying, the onset of DM2 in the registered communities.

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