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***EVALUATION OF FINDRISC (FINNISH DIABETES RISK SCORE) IN PRIMARY
HEALTH CARE IN THE CENTER REGION OF PORTUGAL***

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EVALUATION OF FINDRISC (FINNISH DIABETES RISK SCORE) IN PRIMARY HEALTH CARE IN THE CENTER REGION OF PORTUGAL

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LIST OF ABBREVIATIONS:

ACES: Health Center Cluster /Agrupamento de Centros de Saúde

ARS: Regional Health Administration / Administração Regional de Saúde

T2DM: Type 2 Diabetes Mellitus / Diabetes Mellitus Tipo 2

FINDRISC: Finnish Diabetes Risk Score

ABSTRACT

BACKGROUND: The Finnish diabetes risk score (FINDRISC) is a tool which helps predicting individual risk of developing type 2 diabetes mellitus (T2DM) within the next 10 years. Determining a population's risk is an important step to help primary health providers to take the best action in preventing this disease. This task still lags behind the necessary in the users of primary health care in the center region of Portugal. We aimed to assess the FINDRISC of primary health care users in the center region of Portugal.

METHODS: A cross-sectional, descriptive study conducted regarding data from 2017, 2018, and 2019. Patients from the six Health Center Clusters (ACES) of the Portuguese National Health System Center of Portugal Health Administration were selected and sorted by age, ACES, gender, and FINDRISC group. Descriptive and inferential statistics were performed.

RESULTS: In a population of $n=354041$ without diabetes and with FINDRISC completed, for 13.2% a FINDRISC ≥ 15 was found. Significant differences were found between FINDRISC and every other variable (gender $p<0.001$, ACES $p<0.001$ and age $p<0.001$). Women, users of Pinhal Interior Norte and Cova da Beira ACES and older people were associated with higher risk scores.

CONCLUSION: This study suggests that approximately one in every eight of the primary health care centers users in the center region of Portugal are at high risk of developing T2DM within the next 10 years. This means that prevention and early diagnosis is paramount, with the intervention of family doctors in modifiable risk factors.

KEY WORDS: FINDRISC; TYPE 2 DIABETES MELLITUS; RISK EVALUATION; PRIMARY HEALTH CARE

RESUMO

INTRODUÇÃO: O FINDRISC é uma ferramenta que ajuda a prever o risco individual de desenvolver T2DM nos próximos 10 anos. Determinar o risco populacional é um passo importante para ajudar os profissionais de Cuidados de Saúde Primários a tomar as melhores medidas com o intuito de prevenir a instalação desta doença. Esta tarefa deve ser contínua. O objetivo do estudo foi avaliar o FINDRISC dos utentes dos cuidados de saúde primários da região centro de Portugal.

MÉTODOS: Realizou-se um estudo transversal e descritivo referente aos dados dos anos de 2017, 2018 e 2019. Uteses de seis Agrupamentos de Centros de Saúde (ACES) foram selecionados e classificados por idade, ACES, género e classe de FINDRISC. Para análise dos dados, utilizou-se a estatística descritiva e inferencial.

RESULTADOS: Numa amostra de 354041 pessoas sem diabetes e com FINDRISC calculado, verificou-se que 13,2% dos indivíduos apresentavam FINDRISC ≥ 15 . Foram encontradas diferenças significativas entre FINDRISC e todas as outras variáveis (género, ACES e idade), $p < 0,001$ para todas. Mulheres, utentes dos ACES de Pinhal Interior Norte e da Cova da Beira e idade mais avançada estão associados a maiores scores de risco.

CONCLUSÕES: Este estudo sugere que aproximadamente um em cada oito dos utentes dos centros de saúde estudados na região centro de Portugal se encontram com elevado risco de desenvolver T2DM nos próximos 10 anos. É também reforçada a importância da prevenção e diagnóstico precoce desta doença, através da intervenção dos médicos de família nos fatores de risco modificáveis.

PALAVRAS-CHAVE: FINDRISC; DIABETES MELLITUS TIPO 2; AVALIAÇÃO DE RISCO; CUIDADOS DE SAÚDE PRIMÁRIA.

BACKGROUND

International Diabetes Federation (IDF) estimates 463 million adults worldwide suffer from Type 2 Diabetes Mellitus (T2DM). This number is expected to increase up to 700 million by 2045. IDF also estimates 374 million people at increased risk of developing T2DM. [1] According to the “Annual Report of the Portuguese Diabetes Observatory” by the Portuguese Diabetes Society, in 2015, diabetes affected 13.3% (more than 1 million) and prediabetes 27.4% (2,1 million) of the Portuguese population between the ages 20 and 79 years old. This prevalence is associated with a cost of 1936 million euros, representing 12% of the national health expenses. [2]

T2DM is the most common type of diabetes. It is defined by a chronic hyperglycemic state, which results from the body’s ineffective use of insulin. Over time, diabetes can lead to a wide range of microvascular and macrovascular lesions, which lead to increased morbidity, diminished quality of life, and reduced lifespan.

Individuals with prediabetes – a condition resulting from impaired glucose tolerance (IGT) and/or impaired fasting glycaemia (IFG) - are at higher risk of developing T2DM. [3]

Growing evidence states that early detection of people at higher risk of developing diabetes, followed by pharmaceutical interventions or lifestyle modification, results in the preventability, or at least the delay of the onset of T2DM and its complications. [4,5] This means that it is necessary to identify those at risk. For this purpose, it is recommended by the IDF, the European Association for the Study of Diabetes (EASD) and the European Society of Cardiology (ESC), the use of questionnaires and informative scoring systems to help health-care professionals to characterize diabetes individual risk. [6-9]

One of these surveys is the FINDRISC questionnaire. It is a reliable tool which estimates the chance of an individual to develop T2DM in a 10 year period. [6,9,10] In addition, it can also be used as a screening tool for undiagnosed T2DM, abnormal glucose tolerance, and metabolic syndrome. [15,16] FINDRISC is widely used as a practical screening tool and it has already been validated in different populations. [10-16]

The FINDRISC is composed of eight items. Each item has a score according to its weight on the development of the disease. The total score is comprehended between 0 and 26 points and is classified as:

< 7 points, low risk (1% will develop disease),

7 to 11 points, slightly elevated risk (4% will develop the disease),

12 to 14 points, moderately elevated risk (17% people will develop the disease),
15 to 20 points, high risk (33% will develop the disease) and,
> 20 points, very high risk (50% will develop the disease).

Although it has not yet been validated for the Portuguese population, the FINDRISC questionnaire is included in the Portuguese National Diabetes Prevention and Control Program of 2008, [6,9,17,18] and it is part of the official e.health records program “SClinico” as a preventive tool.

This study aims to get to know the FINDRISC (Finnish Diabetes Risk Score) distribution in the years 2017, 2018 and 2019, in the population of the Center region of Portugal, according to the gender, age, and the ACES of the individual.

METHODS

An observational, cross-sectional study was performed. Analyses were conducted using data from 2017, 2018 and 2019, referring to the population in the geographic area of which Primary Health Care is under health administration of the “ARS Centro”, in the center region of Portugal, provided by the six different health centers cluster: ACES Baixo Mondego; ACES Baixo Vouga; ACES Cova da Beira; ACES Dão Lafões; ACES Pinhal Interior Norte; ACES Pinhal Litoral.

All the data was provided by the informatics services of the ARS Centro after this project was approved by the “ARS Centro” ethics committee.

Eligible participants were those registered in Primary Health Care Units integrated into the ACES above mentioned, aged between 17 and 79 with a FINDRISC already established. Exclusion criteria included individuals that were already diagnosed with diabetes.

The study variables were gender, age, the risk of developing type 2 diabetes in a 10 year period (given by the FINDRISC score), and the ACES of the participant.

Risk score values were stratified into different categories: low risk (scores: < 7), slightly elevated risk (scores: 7-11), moderately elevated risk (scores: 12-14), high risk (scores:15-20) and very high risk (scores > 20).

All data was tabulated in Microsoft Excel, and then exported to Statistical Package for Social Sciences - SPSS, for descriptive statistics and inferential data analysis. All statistical tests were two-sided at 5% significance level. Categorical independent measures were presented as absolute and relative frequencies (%) and tested between groups using non-parametrical tests with a Kruskal-Wallis and Mann-Whitney test and parametrical tests such as t-student. Continuous variables normally distributed were expressed as the mean and standard deviation. Kolmogorov–Smirnov test was used to test the normality of continuous data.

RESULTS

Complete data on 354041 users without any type of diabetes were available. A descriptive overview of the study participants is shown in Table 1. The majority (62%) were females, and the mean age was 51.7±16.0 years old. A proportion of 19.3% of the user's health care was provided by Pinhal Litoral ACES, 20.8% by Baixo Mondego ACES, 31.5% by Baixo Vouga ACES, 18.9% by Dão Lafões ACES, 2.8% by Cova da Beira ACES and 6.7% by Pinhal Interior Norte ACES. Besides, about 13.2% of the population is at high or very high risk of developing T2DM (risk score ≥ 15).

Table 1: Characteristics of the population

	Number	Frequency
Gender		
Male	134622	38%
Female	219419	62%
ACES		
Pinhal Litoral	68263	19.3%
Baixo Mondego	73565	20.8%
Baixo Vouga	11531	31.5%
Dão Lafões	66917	18.9%
Cova da Beira	10042	2.8%
Pinhal Interior Norte	23723	6.7%
FINDRISC		
Low	119720	33.8%
Slightly Elevated	128120	36.2%
Moderately Elevated	59624	16.8%
High	43467	12.3%
Very High	3110	0.9%
Age		
Mean (Standard Deviation)	51.7 (16.0)	

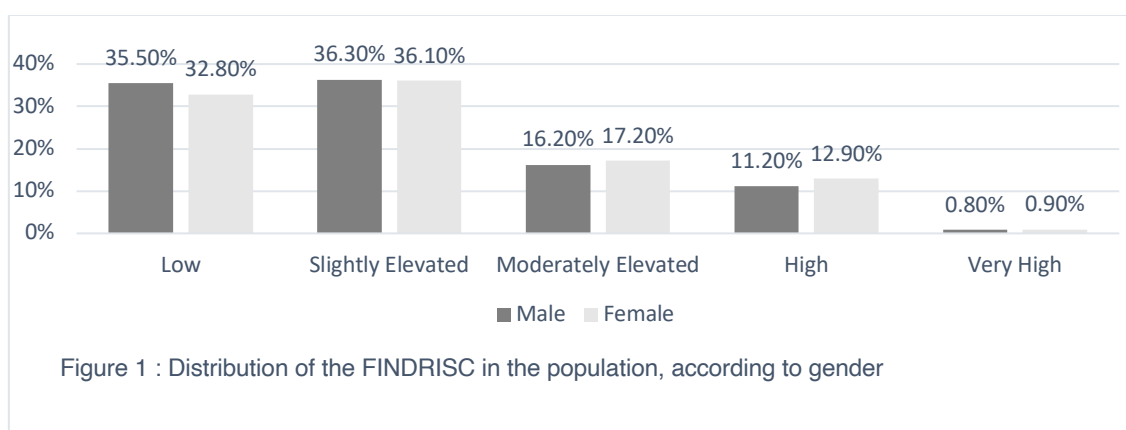
Significant differences between the users of different ACES and the variables gender ($p < 0.001$), age ($p < 0.001$) and FINDRISC ($p < 0.001$) were found. Significant differences were also found between genders and FINDRISC ($p < 0.001$) and age ($p < 0.001$) as well as between FINDRISC and age ($p < 0.001$).

Higher risk scores were associated with aging (Table 2). The mean age for low-risk individuals was approximately 41 years, and it progressively became higher as the risk increased, reaching a mean age of 64 years for very high risk scores.

Table 2: Association of each FINDRISC category and the mean age of the participants

FINDRISC	Mean Age (Standard Deviation)
Low	41.2 (14.5)
Slightly Elevated	54.2 (14.7)
Moderately Elevated	58.7 (13.1)
High	62.5 (10.8)
Very High	63.7 (9.6)

As illustrated in Figure 1, women were associated with an increased risk compared to men, even though women had a slightly lower mean age than men – 51 for women against 53 for men. For 13.8% of women, there was a high or very high risk of developing diabetes in the next 10 years, compared to 12% in men.



Concerning the place of residence, as shown in Table 3, the ACES of Pinhal Interior Norte and Cova da Beira presented the highest percentage of users at high or very high risk of developing T2DM within the next 10 years (risk score ≥ 15) with 16.1% and 16.3%, accordingly, and they correspond to the south-east of the region. These are also the central region's ACES with the lowest number of registered users, the highest mean age and the most female population. The ACES with the lowest percentage of users whose risk is ≥ 15 are the ACES of Pinhal Litoral, with 12.3%; Dão Lafões, with 12.3% and Baixo Vouga with 12.4%.

Table 3: Characteristics of study participants based on the ACES on which they were registered. All Data are presented as number (frequency) unless otherwise specified. *It was used the Kruskal-Wallis test.

	Pinhal Litoral	Baixo Mondego	Baixo Vouga	Dão Lafões	Cova da Beira	Pinhal Interior Norte	P value
Gender							<0.001*
Male	27008(39.6)	28107(38.2)	41908(37.6)	25045(37.4)	3180(31.7)	9374(39.5)	
Female	41255(60.4)	45458(61.8)	69623(62.4)	41872(62.6)	6862(68.3)	14349(60.5)	
Finnish Diabetes Risk Score							<0.001*
Low	24420(35.6)	23554(32.0)	39822(35.7)	22319(33.4)	2882(28.7)	6723(28.3)	
Slightly Elevated	24364(35.7)	26281(35.7)	39673(35.6)	25490(38.1)	3694(36.8)	8618(36.3)	
Moderately Elevated	11131(16.3)	12984(17.6)	18246(16.3)	10863(16.2)	1832(18.2)	4568(19.3)	
High	7831(11.5)	9841(13.4)	12918(11.6)	7781(11.6)	1504(15.0)	3592(15.1)	
Very High	517(0.8)	905(1.2)	872(0.8)	464(0.7)	130(1.3)	222(0.9)	
Age							<0.001*
Mean	51.6	52.2	50.4	52.6	51.6	53.7	
(Standard Deviation)	(15.8)	(15.9)	(16.1)	(16.1)	(15.8)	(16.1)	

DISCUSSION

In the present study, it is shown that using the currently most used FINDRISC cut-off value (risk score ≥ 15) [11], about one individual in every eight (13.2%) amongst the primary health care users of the center region in Portugal is at high or very high risk of developing T2DM within the next 10 years. This percentage was further compared to results in other areas using the same risk score questionnaire and cut-off value. It showed accordance within Continental Portugal, in Amarante, which had a result of 13%, even though their sample mean age is lower than this population. [9] On the other hand, this percentage appears to be inferior comparing to the one presented in the population of the autonomous region of Azores, in Terceira island. [18] Finally, compared to other populations in Europe, such as in Madrid (Spain) or in Athens (Greece), this percentage also appears to be inferior to both of them – 19.5% and 19.1% accordingly. The higher proportion found in the Madrid population can be explained by their mean age, which is about 10 years older than the population in the present study, and that contributes directly to an increased FINDRISC. [19,20]

In this study, it was also revealed that women, older population, and the users of the ACES of Pinhal Interior Norte and Cova da Beira are more associated with higher chances of developing diabetes in the near future.

Age itself, is included in the questionnaire as one of the nonmodifiable risk factors for developing diabetes, contributing directly to an increased FINDRISC. Besides that, with aging, other comorbidities with impact in the FINDRISC such as obesity and hypertension become more prevalent and reinforce the weight of this risk factor. Most of the studies have also come across similar results showing that aging has an impact on increasing the FINDSRISC of the population. [15,18] Since the Portuguese population is getting older, it is expected that the FINDRISC scores presented by this population become progressively higher, along with the incidence of T2DM.

The results also indicate that women are associated with higher FINDRISC which are in accordance with what is stated in studies for the Greek population. [15] Differences in ages between the two genders cannot explain this found since women were presented with a lower mean age, which would decrease the FINDRISC compared to men. The fact that altered glucose metabolism is more common in men [2] makes it less probable the possibility that the item in FINDRISC, which evaluates if the individual has had a high blood glucose concentration at any point in life, is responsible for this found. However, women could be more sensitized and encouraged to tracking glucose levels compared to men, resulting in more women identified with altered glucose metabolism, explaining this tendency. Nonetheless, what is most likely contributing to higher risk scores in women would rather be the other variables evaluated by the FINDRISC including, amongst others, body mass index and physical activity. The last two have

already been evaluated in Portuguese population-based studies, which have shown that women present the highest obesity prevalence and are physically less active than men, which could be explaining why they are presented with higher risk of developing T2DM. [21,22] Contrarily, some studies have shown no correlation between the FINDRISC and gender, [18,19] while others stated higher risk scores are more common amongst men. [7]

Another conclusion is that the south-east population of the Center region in Portugal, who attend Pinhal Interior Norte and Cova da Beira ACES, are associated with the highest number of users at high risk of developing T2DM. These ACES are also associated with the highest proportions of female users and the highest mean age. Family history and genetics could be playing a major role in the discrepancies found in FINDRISC between the ACES. In agreement with this hypothesis is the geographical proximities of the two ACES and the fact that, according to the health profiles of the center region, in 2018, Pinhal Interior Norte and Cova da Beira ACES presented the highest proportion of active diagnoses of T2DM comparing to the other ACES. [23] Nevertheless, further studies should be done in order to re-evaluate these people and understand what is causing these risk scores divergencies. Understanding this would be extremely important since hereditability is not a modifiable risk factor for T2DM, and maybe, a more rigid screening of this disease would be more emergent than implementing modifications in the lifestyle of this population .

According to the census of 2011, Dão Lafões is one of the sub-regions with the youngest population in the center region, which has not been well represented in this study data (which tells us that primary health care users of this sub-region is the second oldest). Since age is one of the risk factors to be considered in the questionnaire, this might have had an impact on the differences observed between de ACES and the FINDRISC. This could be justified by the fact that younger people do not attend primary health care services as frequently as the oldest.

It is important to point some limitations of this study. The applicability of FINDRISC scores may vary between populations due to different lifestyles and genetics. [20] For this reason, it should be validated in each population beforehand. It is yet to be done for the Portuguese population. [9,17,18] Secondly, more participants in our study were women, and this may partly be explained by behavioral habits: women use primary health care services more than men. Besides that, this study does not indicate which variables evaluated in the questionnaire influence the most in patient's risk. Finally, the study refers only to the population of the center region of Portugal and the results cannot be generalized to the whole country. On the other hand, a strong aspect of this study is the large number of participants, which reduces uncertainties and makes data more reliable.

CONCLUSION

Since primary health care services have limited resources, the FINDRISC questionnaire helps not only for a better selection of which individuals should be tested for diagnosis but also for the implementation of a better personalized strategy to modify behavioral habits according to the risk factors of each individual.

Other studies have recommended using lower cut-off values, which would result in a higher number of individuals considered being at high risk of developing T2DM. The purpose behind this is to obtain a more restrict preventability plan of the disease, which could be proven cost-effective, even if screening expenses are higher. For this reason, it should be further studied which cut-off value would be the most adequate for the Portuguese population in order to maximize the screening potentials of this tool.

Older people, women, and the users of the health centers of Cova da Beira and Pinhal Interior Norte which are at higher risk of developing T2DM, should be considered a priority in the control of glucose metabolism.

Finally, this study does not discriminate which of the variables evaluated in the questionnaire influence the most in patient's risk. This risk can be influenced not only by lifestyle and modifiable factors that compromise the individual's health in general (such as obesity, diet and physical activity) but also by non-modifiable factors such as age and family history.

This study should be considered a starting point for further research which will allow us to better characterize the population of the center region of Portugal. This is crucial to understand what risk factors are making the most impact in increasing the populations risk score and only then we can implement preventability strategies aimed for this specific population with the final goal of decreasing the incidence of the disease, increasing the quality of life and diminish expenses in the long run.

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REFERENCES

1. International Diabetes Federation. IDF diabetes atlas, 9th ed.
2. Diabetes, Factos e Números. Relatório Anual do Observatório Nacional da Diabetes. 2016. Disponível em: <https://apdp.pt/publicacoes/relatorio-anual-do-observatorio-nacional-da-diabetes-2016/>
3. World Health Organization. Definition, diagnosis and classification of diabetes mellitus and its complications: report of a WHO consultation. Part 1, Diagnosis and classification of diabetes mellitus. World Health Organization. 1999. Disponível em: <https://apps.who.int/iris/handle/10665/66040>
4. Bailey CJ. The Diabetes Prevention Program: headline results. *Br J Diabetes Vasc Dis.* 2001;1(1):62-64.
5. Lindström J, Ilanne-Parikka P, Peltonen M, Aunola S, Eriksson JG, Hemiö K, et al. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *Lancet.* 2006;368(9548):1673-1679.
6. Dantas R, Azevedo T, Alves M, Balsa M, Albuquerque I, Ferreira M, et al. Utilização do FINDRISC no Rastreio da Diabetes em Utentes Assintomáticos. *Rev Port End Diab Metab.* 2017;12:45-51.
7. Alberti KG, Zimmet P, Shaw J. International Diabetes Federation: a consensus on Type 2 diabetes prevention. *Diabet Med.* 2007;24(5):451-463.
8. The Task Force on diabetes, pre-diabetes, and cardiovascular diseases of The European Society of Cardiology (ESC) and developed in collaboration with the European Association for the Study of Diabetes (EASD). ESC Guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD. *Eur Heart J.* 2013;34:3035-87.
9. Valente T, Azevedo L. Estudo RADAR - Risco aumentado de diabetes em Amarante. *Rev Port Med Geral Fam.* 2012;28(1):18-24.
10. Lindström J, Tuomilehto J. The diabetes risk score: a practical tool to predict type 2 diabetes risk. *Diabetes Care.* 2003;26(3):725-731.
11. Štiglic G, Fijačko N, Stožer A, Sheikh A, Pajnikihar M. Validation of the Finnish Diabetes Risk Score (FINDRISC) questionnaire for undiagnosed type 2 diabetes screening in the Slovenian working population. *Diabetes Res Clin Pract.* 2016;120:194-197.
12. Lin JW, Chang YC, Li HY, Chien YF, Wu MY, Tsai RY, et al. Cross-sectional validation of diabetes risk scores for predicting diabetes, metabolic syndrome, and chronic kidney disease in Taiwanese. *Diabetes Care* 2009;32:2294-6.
13. Bergmann A, Li J, Wang L, Schulze J, Bornstein SR, Schwarz PE. A simplified Finnish diabetes risk score to predict type 2 diabetes risk and disease evolution in a German population. *Horm Metab Res.* 2007;39(9):677-682.

14. Soriguer F, Valdés S, Tapia MJ, et al. Validación del FINDRISC (FINnish Diabetes Risk SCore) para la predicción del riesgo de diabetes tipo 2 en una población del sur de España. Estudio Pizarra [Validation of the FINDRISC (FINnish Diabetes Risk SCore) for prediction of the risk of type 2 diabetes in a population of southern Spain. Pizarra Study]. *Med Clin (Barc)*. 2012;138(9):371-6.
15. Makrilakis K, Liatis S, Grammatikou S, et al. Validation du questionnaire finlandais calculant un score de risque de diabète (FINDRISC) pour le dépistage du diabète de type 2, des anomalies de la glycorégulation et du syndrome métabolique en Grèce [Validation of the Finnish diabetes risk score (FINDRISC) questionnaire for screening for undiagnosed type 2 diabetes, dysglycaemia and the metabolic syndrome in Greece]. *Diabetes Metab*. 2011;37(2):144-51.
16. Saaristo T, Peltonen M, Lindström J, et al. Cross-sectional evaluation of the Finnish Diabetes Risk Score: a tool to identify undetected type 2 diabetes, abnormal glucose tolerance and metabolic syndrome. *Diab Vasc Dis Res*. 2005;2(2):67-72.
17. Direção-Geral da Saúde. Direção de Serviços de Cuidados de Saúde, Programa Nacional de prevenção e controlo da diabetes. Lisboa: DGS, 2008
18. Viveiros AS, Borges M, Martins R, Anahory B, Cordeiro MS. Estudo LIDIA: risco de diabetes mellitus tipo 2 numa população rural dos Açores. *Rev Port End Diab Metab*. 2015;10(2):124-127.
19. Salinero-Fort MA, Pau ECS, Abánades-Herranz JC, Dujovne-Kohan I, Cárdenas-Valladolid J. Riesgo basal de Diabetes Mellitus en Atención Primaria según cuestionario FINDRISC, factores asociados y evolución clínica tras 18 meses de seguimiento. *Rev Clin Esp*. 2010;210(9):448-53.
20. Makrilakis K, Liatis S, Grammatikou S, Perrea D, Katsilambros N. Implementation and effectiveness of the first community lifestyle intervention programme to prevent Type 2 diabetes in Greece. The DE-PLAN study. *Diabet Med*. 2010;27(4):459-465.
21. Oliveira A, Araújo J, Severo M. et al. Prevalence of general and abdominal obesity in Portugal: comprehensive results from the National Food, nutrition and physical activity survey 2015–2016. *BMC Public Health*. 2018;18:614.
22. Teixeira PJ, Marques A, Lopes C, Sardinha LB, Mota JA. Prevalence and Preferences of Self-Reported Physical Activity and Nonsedentary Behaviors in Portuguese Adults. *J Phys Act Health*. 2019;16(4):251-258.
23. Administração Regional de Saúde da região Centro. Perfis de Saúde da Região Centro. Disponível em: <https://www.arscentro.min-saude.pt/SaudePublica/PlaneamentoSaude/Paginas/Diagnostico.aspx>

ANNEXES

ANNEX I: FINDRISC questionnaire (translation published in the Diabetes Prevention and control)

Diabetes

Avalie o seu risco

A diabetes tipo 2 é uma doença cada vez mais frequente.
Pode ter consequências graves se não for correctamente cuidada.

A diabetes afecta já mais de 4% da população mundial. Com o avançar da idade o risco de ter diabetes aumenta e muitas pessoas tem diabetes sem o saber.

Ao responder a 8 questões simples, você pode determinar o risco de desenvolver diabetes tipo 2 nos próximos 10 anos. Aproveite, faça o teste com o questionário FINDRISC (Finnish Diabetes Risk Score).

1. Que idade tem?
 - a. Menos de 35 anos 0 pontos
 - b. Entre 35 e 44 anos 1 ponto
 - c. Entre 45 e 54 anos 2 pontos
 - d. Entre 55 e 64 anos 3 pontos
 - e. Mais de 64 anos 4 pontos
2. Algum membro da sua família tem diabetes?
 - a. Não 0 pontos
 - b. Sim, um membro da família afastado: avô, tia, tio, primo... 3 pontos
 - c. Sim, um membro próximo da família: pai, mãe, filho, irmão, irmã 4 pontos
3. Qual é a sua medida abdominal, ao nível do umbigo?

Homens	Mulheres	
Menos de 94cm	Menos de 80 cm	0 pontos
94 a 102 cm	80 a 88 cm	3 pontos
Mais de 102 cm	Mais de 88 cm	4 pontos
4. Pratica pelo menos 30 minutos de actividade física por dia?
 - a. Sim 0 pontos
 - b. Não 2 pontos
5. Costuma comer legumes e frutas?
 - a. Todos os dias 0 pontos
 - b. Nem sempre 1 ponto
6. Toma medicamentos para a hipertensão?
 - a. Não 0 pontos
 - b. Sim 2 pontos
7. Alguma vez descobriu que tinha a taxa de açúcar no sangue elevada?
 - a. Não 0 pontos
 - b. Sim 5 pontos
8. Qual é o seu índice de massa corporal (IMC)?

O IMC é calculado através da fórmula: peso corporal (em Kg) dividido por a altura (em m) ao quadrado. Pode também encontrar na tabela da página seguinte.

 - a. Menos de 25Kg/m² 0 pontos
 - b. Entre 25 e 30 Kg/m² 1 ponto
 - c. Mais de 30 Kg/m² 3 pontos

Total de pontos:

Some os pontos correspondentes às suas respostas e anote os números em cada uma.
Controle na tabela da página 4 qual o seu risco de diabetes.

Risco de diabetes –Explicações

Idade

Apesar da diabetes se manifestar cada vez mais em pessoas mais jovens a idade continua a ser um dos principais factores de risco. Com a idade o efeito da insulina diminui sobretudo nas pessoas com excesso de peso. Para remediar o pâncreas aumenta a produção de insulina. Quando o órgão se encontra nos limites da produção a diabetes manifesta-se.

Hereditariedade

Se tem parentes próximos com diabetes este também será certamente um factor de risco. Os factores genéticos têm igualmente um papel importante na diabetes tipo 2. Por exemplo: se um dos pais é diabético, os filhos tem 30 a 40% de probabilidades de desenvolver diabetes tipo 2.

Medida abdominal

Actualmente os cientistas estão de acordo quando dizem que a quantidade gordura a nível do abdómen tem um papel relevante no desenvolvimento da diabetes tipo 2. Tem claramente uma actividade metabólica mais importante que o tecido adiposo sub-cutâneo (debaixo da pele) existente nas ancas e das nádegas.

Como medir: em pé, deverá medir a largura com a ajuda duma fita métrica colocada entre a parte inferior das costelas (em baixo da última costela) e a crista ilíaca (parte superior dos ossos da bacia). O valor é anotado depois de uma inspiração normal à altura do umbigo.

Actividade Física

O sedentarismo aumenta de forma alarmante nos países industrializados. Estima-se que, nos dias que correm, as pessoas não façam metade do exercício que se fazia à 50 anos. Mesmo que os 30 minutos de actividade física quotidiana pareçam pouco, os estudos demonstram que é suficiente para diminuir de forma notável o risco de diabetes. A terminologia actividade física não abrange só as actividades desportivas como bicicleta ou andar pé, as actividades no local de trabalho (por exemplo: repor artigos nas prateleiras) ou de trabalhos domésticos (por exemplo: limpar vidros, trabalhar no jardim...) contam igualmente.

Legumes e frutas

A nossa alimentação fornece a energia necessária ao nosso organismo. Os principais fornecedores energéticos são as gorduras e os glícidos. Os alimentos fabricados industrialmente também têm energia em grandes quantidades. Consumindo muitos legumes e frutas frescas, você diminui o risco de uma alimentação rica em calorias e igualmente fornece ao seu organismo as vitaminas e minerais necessários.

Hipertensão arterial

A hipertensão arterial pode não apresentar sintomas pelo que a pessoa pode desconhecer que a tem. É frequente ocorrer em pessoas com excesso de peso. As pessoas com diabetes sofrem três vezes mais de hipertensão arterial que as não diabéticas.

Se não for tratada a hipertensão aumenta o risco de enfarte de miocárdio e de acidente vascular cerebral.

Glicemia

Nas pessoas saudáveis os valores da glicemia em jejum situam-se abaixo dos 100 mg/dl (medida da extremidade do dedo).

As pessoas num estadio precoce de diabetes apresentam valores mais elevados. Um valor único ligeiramente aumentado não representa necessariamente uma razão para se preocupar mas também não convém ficar completamente descansado, convém controlar a sua glicemia de forma regular.

Índice de massa corporal

O IMC relaciona o seu peso com a sua altura.

Se a fórmula lhe parecer muito complicada, pode igualmente ler os valores na tabela: procurando o valor de inter-secção do seu peso com a sua altura.

Risco de ter diabetes nos próximos dez anos

Até 7 pontos

1%*

O risco que tem de vir a ter diabetes é muito reduzido. Não é necessária uma prevenção particular apenas deverá ter uma alimentação saudável e realizar actividade física regular.

Entre 7 e 11 pontos

4%*

Convém ser prudente apesar do risco de se tornar diabetes ser ligeiro. Se quiser ter a certeza tenha em conta as regras seguintes:

- Em caso de obesidade, deverá perder 7% do seu peso;
- Pratique uma actividade física com ligeira transpiração durante 30 minutos pelo menos 5 dias por semana;
- Limite o consumo de gordura a 35% das calorias totais da sua alimentação;
- As gorduras saturadas (gorduras animais) não devem ultrapassar 10% das calorias da sua alimentação;
- Consuma por dia 30 gramas de fibras alimentares (contidas nos produtos à base de cereais completos, legumes e frutas).

De 12 a 14 pontos

17%*

Se estiver nesta categoria de risco convém por em prática as medidas de prevenção. Convém ter em conta as informações e recomendações práticas dos peritos para mudar os seus hábitos de vida. Se não conseguir sozinho recorra a ajuda profissional.

De 15 a 20 pontos

33%*

Você está realmente em risco, um terço das pessoas que apresentam este grau de risco tornam-se diabéticas no decurso dos 10 anos seguidos. Não subestime esta situação pois isso poderia ter consequências graves para a sua saúde. Recorra a ajuda profissional e fale com o seu médico.

Mais de 20 pontos

50%*

A necessidade de agir é eminente porque pode acontecer que já tenha diabetes. Isso é verdade para 35% das pessoas que totalizam mais de 20 pontos. Pode testar a sua glicemia na extremidade do dedo para informação complementar. Este teste não substitui um diagnóstico completo num laboratório pelo que é indispensável uma consulta médica.

(*) Um risco de 4% significa que 4 pessoas em 100 que apresentam esse risco podem desenvolver diabetes tipo 2 nos 10 anos seguintes.

ANNEX II : Ethics committee approval



COMISSÃO DE ÉTICA PARA A SAÚDE

PARECER FINAL: FAVORÁVEL	DESPACHO: Conselho Diretivo da A.R.S. do Centro, I.P.
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ASSUNTO:	Parecer sobre o Projeto 52/2020 – “Avaliação do FindRISK (Finnish Diabetes Risk Score) nos Cuidados de Saúde Primários da Região Centro”.
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Presidente,

Dr. Luís António Cabral Vagal

Este estudo é apresentado pelo Lic. João Pedro Silva Brillhante, estudante no 5º ano do Mestrado Integrado de Medicina da Faculdade de Medicina da Universidade de Coimbra e tem como coproponentes os Prof. Doutores José Augusto Rodrigues Simões e Luiz Miguel de Mendonça Soares Santiago, ambos da Faculdade de Medicina da Universidade de Coimbra.

É referido pelos autores que o FindRISK é uma ferramenta de rastreio de risco para diabetes, já validada e implementada no SClínico para a Medicina Geral e Familiar. O objetivo deste estudo é avaliar o preenchimento deste questionário na população da Região Centro, à data de 31 de dezembro de 2019, em função do ACeS onde se encontra inscrita, da idade e do sexo.

Os dados serão solicitados de uma forma anonimizada, aos Serviços de Informática da ARS do Centro.

Face à descrição apresenta deste projeto é emitido um parecer positivo.

O Relator: Prof. Doutor Pedro Lopes Ferreira

O Presidente da CES: Prof. Doutor Fontes Ribeiro