Global Academic Nursing Journal

ORIGINAL ARTICLE

Assessment of the risk of developing type 2 diabetes mellitus in a family health unit

Evaluación del riesgo de desarrollar diabetes mellitus tipo 2 en una unidad de salud de la familia

Avaliação do risco de desenvolver diabetes mellitus tipo 2 em uma unidade saúde familiar

Jorge Manuel Ramos da Silva[1]
ORCID: 0000-0001-9821-9825
Ermelinda Maria Bernardo Gonçalves Marques[2]
ORCID: 0000-0003-3024-8392

[1]Unidade Local de Saúde da Guarda – UCSP Fornos Algodres. Guarda, Portugal.
[2]Escola Superior de Saúde do Instituto Politécnico da Guarda. Guarda, Portugal.

How to cite this article:
Silva JMR, Marques EMBG. Assessment of the risk of developing type 2 diabetes mellitus in a family health unit. Glob Acad Nurs. 2022;3(3):e260. https://dx.doi.org/10.5935/2675-5602.20200260

Corresponding author:
Jorge Manuel Ramos da Silva
E-mail: jorgeramosdasilva@gmail.com

Submission: 05-31-2022
Approval: 08-01-2022

Abstract

It was intended to evaluate the risk of developing type 2 diabetes mellitus over a period of 10 years in the adult population of a Family Health Unit in the central region of Portugal. A descriptive-correlational, cross-sectional study was carried out in a probabilistic, simple random sample, consisting of 341 participants aged between 45 and 54 years, 54.3% female and 45.7% male. After obtaining authorizations and individual informed consent, data collection was carried out through a semi-structured interview. The risk assessment scale for developing type 2 diabetes mellitus (FINDRISC) was used. Statistical treatment was performed by computer using the Statistical Package for Social Science program, version 23 of 2016. 129 participants were identified with moderately high, high or very high risk of developing type 2 diabetes mellitus, and the participants with the highest risk are men, those living in rural areas, those taking anti-dyslipidemics, smokers and hypertensive patients. Participants who presented modifiable risk factors were made aware of the adoption of healthy behaviors, lifestyles and habits, highlighting the need to implement strategies that aim to reduce the effect of risk factors, thus enhancing the achievement of health gains in this sample.

Descriptors: Primary Health Care; Diabetes Mellitus; Nursing Care; Risk Factors; Lifestyle.

Resumén

El objetivo fue evaluar el riesgo de desarrollar diabetes mellitus tipo 2 durante un período de 10 años en la población adulta de una Unidad de Salud de la Familia en la región central de Portugal. Se realizó un estudio descriptivo-correlacional, de corte transversal, en una muestra aleatoria probabilística simple, conformada por 341 participantes con edades entre 45 y 54 años, 54,3% mujeres y 45,7% hombres. Después de obtener las autorizaciones y el consentimiento informado individual, la recolección de datos se realizó a través de una entrevista semiestructurada. Se utilizó la escala de evaluación de riesgo para desarrollar diabetes mellitus tipo 2 (FINDRISC). El tratamiento estadístico se realizó por computadora mediante el programa Statistical Package for Social Science, versión 23 de 2016. Se identificaron 129 participantes con riesgo moderado alto, alto o muy alto de desarrollar diabetes mellitus tipo 2, y los participantes con mayor riesgo son hombres, los que viven en zonas rurales, los que toman antidislipemiantes, los fumadores y los hipertensos. Los participantes que presentaron factores de riesgo modificables fueron sensibilizados sobre la adopción de conductas, estilos de vida y hábitos saludables, destacando la necesidad de implementar estrategias que apunten a reducir el efecto de los factores de riesgo, potenciando así el logro de ganancias en salud en esta muestra.

Descriptores: Atención Primaria de Salud; Diabetes Mellitus; Cuidado de Enfermería; Factores de Riesgo; Estilos de Vida.

Resumo

Pretendeu-se avaliar o risco de desenvolvimento de diabetes mellitus tipo 2 em um período temporal de 10 anos na população adulta de uma Unidade de Saúde Familiar da região centro de Portugal. Recorreu-se a um estudo descritivo-correlacional, transversal, numa amostra probabilística, aleatória simples, constituída por 341 participantes com idades compreendidas entre 45 e 54 anos, 54.3% do sexo feminino e 45.7% do sexo masculino. Após obtenção das autorizações e consentimento informado individual, a recolha de dados foi efetuada através de entrevista semiestruturada. Utilizou-se escala de avaliação do risco de desenvolvimento de diabetes mellitus tipo 2 (FINDRISC). O tratamento estatístico foi efetuado informaticamente recorrendo ao programa de Statistical Package for Science Social, versão 23 de 2016. Identificaram-se 129 participantes com risco moderadamente alto, alto ou muito alto de desenvolverem diabetes mellitus tipo 2, sendo que os participantes com maior risco são homens, os residentes em meio rural, os que tomam antidislipidémicos, fumadores e hipertensos. Os participantes que apresentaram fatores de risco modificáveis, foram sensibilizados quanto à adoção de comportamentos, estilos de vida e hábitos saudáveis, realçando-se a necessidade da implementação de estratégias que visem diminuir o efeito dos fatores de risco, potencializando-se assim a obtenção de ganhos em saúde nesta amostra.

Descritores: Atenção Primária à Saúde; Diabetes Mellitus; Cuidados de Enfermagem; Fatores de Risco; Estilos de Vida.

Introduction

Diabetes is a serious chronic disease that originates from insufficient production of insulin by the pancreas or when it is not used effectively by the body. It is seen as a public health problem, insofar as it is considered as one of the non-communicable diseases of priority character by world organisms, and the values of its prevalence continue to increase in recent years at a global level, since 422 million people had diabetes in 2014, when in 1980 this figure was around 108 million[1].

The first global report of the World Health Organization (WHO) on diabetes, in which an alert is made for the need for global action to combat the disease, thus integrating the objectives of the WHO World Action Plan in the fight against non-communicable diseases[1].

Type 2 Diabetes Mellitus (DM2) is the most prevalent type of diabetes, resulting from defects in insulin secretion, a situation that is almost always associated with insulin resistance, and its estimated prevalence in the Portuguese population aged between 20 and 20 79 years (7.7 million individuals) was 13.6% in 2018, that is, more than 1 million Portuguese in this age group have diabetes[2,3].

In turn, in Brazil, 17 million adults (between 20 and 79 years old) are diagnosed with diabetes, equivalent to 11.4% of the population in this age group[4].

This pathology can give rise to complications that can become chronic at various levels, more specifically in: feet, kidneys, eyes (microvascular complications), as well as macrovascular complications, which can cause acute myocardial infarction and/or stroke. Its complications are potentially fatal and responsible for a growing deterioration in the quality of life of patients, and may evolve asymptomatically, and clinical indicators considered negative are associated with this disease, such as increased length of stay, the risk of complications , the increase in the differentiation and complexity of the care provided, the loss of autonomy and the higher mortality[2,5].

It is increasingly recognized that the reduction of risk factors (poor and unbalanced diet, obesity, lack of physical activity, alcohol and tobacco consumption) are part of a fundamental prevention strategy that allows reducing the incidence and prevalence of the pathology in question, as well as its complications that can be avoided through early diagnosis and the promotion of a healthy lifestyle[6].

Thus, there is an urgent need to control the rampant increase in the prevailing values of diabetes. Taking into account the implications of this disease, it became relevant to design and develop a study that illustrates and allows a better understanding and understanding of the risk assessment of DM2 to identify early adults at risk of developing the disease. The main objective of this study was to evaluate the risk of developing DM2 over a period of 10 years in the adult population of a Family Health Unit (USF) in the central region of Portugal.

Methodology

This investigation had a descriptive-correlational and transversal approach. Data collection took place between April and July 2017 at a USF, which has a population of 14,090 registered users (of which 7,558 are female and 6,532 are male), of which 9,685 are in adulthood. We chose to study users aged between 45 and 54 years (a total of 2,355), taking into account that diabetes has a higher prevalence in the age group over 45 years.

The following inclusion criteria were defined: being enrolled at the USF, being aged between 45 and 54 years and accepting to participate in the study. Exclusion criteria are: being diagnosed with DM2, being pregnant and being institutionalized. Through the OpenEpi online platform, it was concluded that in order to obtain a confidence interval of at least 95% of confidence, the sample size would be at least 331 individuals, obtaining, however, a sample of 341 participating users.

The simple random probability sample was obtained by randomly selecting 15 names per page from the list of all the users of the institution and that corresponded to the inclusion and exclusion criteria. For this selection method, all users included in the list were numbered, then a computer was used and they were entered into a digital database of the Statistical Package for Social Science (SPSS) computer program, using the option Random Samples of Cases, which randomly chose the numbers to consider for the sample. After selection, they were contacted by telephone, the purpose of the study was explained and invited to attend the same institution for data collection, through an individual interview, with date and time scheduled. Users who did not show up for data collection were replaced by others from the same listing page.

The collected data were registered and encoded in a database, using the Microsoft Excel® software, and later imported into the Statistical Package for Social Science (SPSS) program, version 23 of 2016 for statistical treatment. The statistical techniques applied were frequencies (absolute and percentage), measures of central tendency (ordinal mean, mean and median), measures of dispersion or variability (minimum value, maximum value and standard deviation), Cronbach's alpha coefficient, Mann- Whitney test, Kruskal-Wallis test and Kolmogorov-Smirnov test (as normality test). For all tests, the value 0.050 was set as the limit of significance, that is, the null hypothesis was rejected when the probability of type I error (probability of rejection of the null hypothesis when it is true) was lower than the fixed value, that is, when $p < 0.050$.

The objectives of the study were explained to all participants, data anonymity was guaranteed, authorization was obtained from each one to participate in the study, through informed consent, which followed the guidelines of the Declaration of Helsinki and the Oviedo Convention.

Access to the list of users and subsequent authorization to apply the data collection instruments were approved by the coordinator of the USF, by the President of the Board of Directors of the Local Health Unit to which the USF belongs, and with the favorable opinion of the Ethics Committee of this institution.

Results

The study sample is composed of 341 participants, with an age range between 45 and 54 years, with an average

age of 49.67 years, mostly female (54.3%), married (69.1%), residing mainly in urban environment (62.2%). Regarding education, 36% had a higher education course, with the profession/occupation, functions that are part of Group 2 (Specialists in intellectual and scientific activities) and Group 5 (Personal, protection and sales service workers) according to the Portuguese Classification of Professions by the National Statistics Institute. Households are mostly made up of 3 or 4 members (65.4%), belonging to nuclear families (49.3%).

Regarding coffee consumption habits, a large part of the sample refers to drinking coffee (70.4%), an average of 2.85 coffees daily.

Regarding the situation of the participants regarding tobacco, the majority are non-smokers (63.8%), however, those who consider themselves to be active smokers (24.6%), in general, have been smoking for 30 years or more (53.6%), smoking between 5 to 9 cigarettes (47.6%) with an average of 9.27 per day.

With regard to taking medication, 66.3% of the participants answered in the affirmative. The most referred pharmacological groups were mainly antidyslipidemics (38.9%), antihypertensives (29.6%), contraceptives (22.1%), anxiolytics (20.4%) and antidepressants (13.3%).

Regarding Blood Pressure (BP), the data show that 33.7% of the participants revealed a pre-hypertension profile, followed by 32.8% who were hypertensive (stage 1) and 32.0% who revealed a normal BP. The mean value was 125.60 mmHg with a standard deviation of 20.70 mmHg. Half of the individuals had values equal to or lower than 130.00 mmHg. Frequency distribution deviated from a normal curve ($p < 0.001$), both in diastolic and systolic BP.

Regarding the variables of the scale that allowed assessing the risk of developing type 2 diabetes mellitus (FINDRISC), it was found that 51.6% were overweight and 9.7% were already considered obese, 24.6% had waist measurement values that revealed abdominal obesity, and 60.7% had a family history of diabetes. Of the 207 individuals who answered affirmatively to the question about the existence of a family history of diabetes, 150 (72.5%) assumed that they had changed or intend to change their lifestyles/behaviours after being aware of this diagnosis in family members.

As for risk factors related to lifestyle, it was found that 48.1% did not practice regular physical activity, 35.2% did not eat fruit and/or vegetables daily.

Table 1. Results of the risk assessment scale for developing type 2 diabetes mellitus (FINDRISC). Guarda, Portugal, 2017

Variables	n	%
Age (years)		
45 – 54	341	100.0
Body mass index (kg/m²)		
Less than 25	132	38.7
25 – 30	176	51.6
More than 30	33	9.7
Waist measurement (cm)		
Male: less than 94; Female: under 80	159	46.6
Male: 94 - 102; Female: 80 - 88	98	28.7
Male: more than 102; Female: over 88	84	24.6
Daily practice of physical activity for at least 30 minutes		
Yes	177	51.9
No	164	48.1
Intake of vegetables and/or fruits		
Every day	221	64.8
Sometimes	120	35.2
Takes regularly or has already taken any medication for high blood pressure		
No	253	74.2
Yes	88	25.8
Previous episode of hyperglycemia		
No	237	69.5
Yes	104	30.5
Family history of diabetes (type 1 or type 2)		
No	134	39.3
Yes: grandparents, aunts, uncles or 1st cousins	106	31.1
Yes: parents, brothers, sisters or children	101	29.6
If you answered yes, did you change your lifestyle/behavior after becoming aware of this diagnosis?		
Yes	150	72.5
No	57	27.5

Regarding the characterization of the risk of DM2 (Table 2), it was found that 129 (37.9%) participants showed moderate, high and very high risk of developing diabetes in the next 10 years.

The observed scores were between 2 and 22 points, with an average value of 9.86 points with a standard deviation of 4.47 points. Half of the sample elements obtained results equal to or greater than 10.00 points, and

the frequency distribution cannot be considered normal ($p < 0.001$). In the comparison of the risk of DM2 according to sex, means of residence, profession/occupation, smoking habits, blood pressure and with the application of the tests: Mann-Whitney U for sex and means of residence, Kruskal-Wallis for profession/occupation, smoking habits and ED, statistically significant results were obtained, which allows us to say that the risk of DM2 is higher in men, in rural residents, in those who have professions in groups 6 (Farmers and skilled workers from the agriculture, fisheries and forestry) and 7 (Skilled workers in industry, construction and craftsmen) or 8 (Installation and machinery operators and assembly workers) and 9 (Unskilled workers), smokers and hypertensive patients (Table 3).

Table 2. Characterization of the risk of developing type 2 diabetes mellitus. Guarda, Portugal, 2017

Risk of type 2 diabetes mellitus	n	%
Low risk (< 7 points)	84	24.6
Slightly high risk (7 - 11 points)	128	37.5
Moderate risk (12 - 14 points)	65	19.1
High risk (15 – 20 points)	63	18.5
Very high risk (> 20 points)	1	0.3

Table 3. Comparison of the risk of developing type 2 diabetes mellitus according to sex, place of residence, profession/occupation, smoking habits, blood pressure. Guarda, Portugal, 2017

	Risk of Type 2 Diabetes Mellitus			
Variables	**n**	**Mean**	**Median**	**Correlation coefficient**
Sex				
Masculine	156	10.40	10.50	0.039
Feminine	185	9.40	9.00	
Means of residence				
Rural	129	11.51	12.00	<0.001
Urban	212	8.85	9.00	
Profession/Occupation (grouped)				
Groups 0 to 2	110	8.87	8.00	0.003
Groups 3 to 5	106	9.62	10.00	
Groups 6 to 7	56	11.30	12.00	
Groups 8 to 9	36	11.31	11.00	
Not active	32	9.81	9.00	
Smoking habits				
Non Smoking	218	8.89	9.00	<0.001
Ex-smoker	39	9.79	9.00	
Smoker	84	12.39	13.00	
Blood pressure (grouped)				
Normal	109	7.71	7.00	<0.001
pre-hypertensive	115	10.13	10.00	
Hypertensive (stage 1 or 2)	117	11.60	13.00	

Discussion

The focus of this investigation was the assessment of the risk of developing DM2 over a period of 10 years, in a sample of adult individuals between 45 and 54 years old enrolled in a USF. The results obtained showed that 129 elements of the sample (37.9%) had scores ≥12, translating into: "moderate risk" in 65 participants (19.1%), "high risk" in 63 participants (18.5%) and "very high risk". high" in 1 participant (0.3%).

Participants who scored ≥15, (which gives a high or very high risk), were referred and referred to the respective multidisciplinary health team of reference, so that it could directly intervene in the modifiable risk factors, having taking into account the recommendations of the General Directorate of Health through the most up-to-date and recent Integrated Assistance Process for Type 2 Diabetes Mellitus[7]. This action will allow adequate monitoring and the performance of auxiliary diagnostic tests (for example oral glucose tolerance test), thus allowing a more accurate description of the current health status of the referred participants.

Compared to other studies carried out in Portugal, it was found that the moderately high, high and very high risks of developing DM2 were 42%, and 48.8%[8,9]. In turn, studies carried out in Brazil showed that the moderately high, high and very high risk was 46.6%[10], and in another study from the same country, the high and very high risk was 14.3%[11]. Another study carried out in Mexico revealed that 59% are at moderately high, high and very high risk[12].

The average T2DM risk value for men (10.40) is higher than that for women (9.40), thus maintaining a similar pattern to the national one[3,9].

A similar situation occurs at the international level as well, accepting that women tend to assume more responsible attitudes, of greater demand for health services and greater care in relation to health[13-15].

It was also found that the risk of developing DM2 is greater in rural areas of residence, a situation that is frequently observed[16].

In this sample, professional activity influences the risk of DM2, it can be seen that the highest risk of DM2 is present in groups 6, 7, 8, 9, which are those that can be generally considered as being the ones with the lowest demands in terms of regarding academic competences, and the existing bibliography states that in areas with populations of non-diabetic people, but where this disease had a high geographic prevalence, people with a higher educational level had greater knowledge about the pathology[17,18].

In this study, the average risk of DM2 of non-smokers was 8.89, while in ex-smokers it rose to 9.79 and of active smokers, the average risk of DM2 was 12.39, thus considering the increased risk of DM2 due to tobacco consumption[19].

It is not unexpected that in the participants of the sample with higher values of TA, the average risk of DM2 is higher, more specifically, the participants who were normotensive, the average risk was 7.71, while the hypertensive participants , the risk increased considerably to 11.60, a situation corroborated by the scientific community[20,21].

However, it is expected that the public health crisis due to the COVID-19 pandemic has increased the number of undiagnosed diabetics, revealing the weaknesses that already exist in the health systems and that worsened with the pandemic, it is estimated that, in Portugal, about 20 thousand people may not have had access to the conditions for an early diagnosis of the pathology[5,22,23].

Conclusion

The present study made it possible to assess the risk of developing DM2 in a sample of 341 individuals, over a period of 10 years and revealed that the risk of diabetes is moderately high, high or very high in 129 participants. This highlights the need to invest in diabetes prevention rather than treatment, thus enhancing health gains.

Community intervention programs enable and empower individuals and families, so that they take responsibility and adopt healthy lifestyles. The active participation of all can become an important contribution towards counteracting the “epidemiological” trend of diabetes.

References

1. Organização Mundial da Saúde (OMS). Informe Mundial Sobre la Diabetes. [Internet]. Genova: OMS; 2021 [acesso em 30 mai 2022]. Disponível em: https://www.who.int/es/news-room/fact-sheets/detail/diabetes
2. Direção-Geral da Saúde (DGS). Programa Nacional para a Diabetes. [Internet]. Portugal: DGS; 2017 [acesso em 31 mai 2022]. Disponível em: https://www.dgs.pt/programa-nacional-para-a-diabetes/relatorios-e-publicacoes.aspx
3. Sociedade Portuguesa de Diabetologia (SPD). Diabetes, Factos e Números, Os Anos de 2016, 2017 e 2018 [Internet]. Portugal: SPD; 2019 [acesso em 31 mai 2022]. Disponível em: https://www.spd.pt/images/uploads/20210303-154553/DF&N-2019_Final.pdf
4. Sociedade Brasileira de Diabetes (SBD). Diretrizes da Sociedade Brasileira de Diabetes [Internet]. São Paulo (SP); 2019 [acesso em 30 mai 2022]. Disponível em: http://www.saude.ba.gov.br/wp-content/uploads/2020/02/Diretrizes-Sociedade-Brasileira-de-Diabetes-2019-2020.pdf
5. Sociedade Portuguesa de Medicina Interna (SPMI) [Internet]. Portugal: SPMI; 2021 [acesso em 30 mai 2022]. Disponível em: https://www.spmi.pt/pandemia-agravou-numero-de-diabeticos-nao-diagnosticados/
6. Sociedade Europeia de Cardiologia (ESC). Recomendações de Bolso de 2019 da Sociedade Europeia de Cardiologia [Internet]. Portugal: ESC; 2019 [acesso em 31 mai 2022]. Disponível em: https://spc.pt/wp-content/uploads/2020/07/Diabetes-Definitivo.pdf
7. Direção Geral da Saúde (DGS). Processo Assistencial Integrado para a Diabetes [Internet]. Portugal: DGS; 2013 [acesso em 30 mai 2022]. Disponível em: https://comum.rcaap.pt/bitstream/10400.26/22724/1/Programa%20Nacional%20para%20a%20Diabetes%202017.pdf
8. Silva S, Ferreira I, Cruz A, Ricardo M, Pereira C, Alves R, et al. Auditoria clínica ao tratamento da Diabetes mellitus num serviço de Medicina Interna – O internamento como janela de oportunidade. Rev Port Endocrinol Diabetes Metab. 2015,10(2):141–146. http://dx.doi.org/10.1016/j.rpedm.2015.02.002
9. 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 Endocrinol Diabetes Metab. 2017,12(1):45-51. http://dx.doi.org/10.1016/j.rpedm.2015.10.028
10. Araújo L, Silva E, Mariano J, Moreira R, Prezotto K, Fernandes C, et al. Risco para desenvolvimento do diabetes mellitus em usuários da atenção primária a saúde: um estudo transversal. Rev Gaúcha Enferm. 2015,36(4):77-83. http://dx.doi.org/10.1590/1983-1447.2015.04.50195
11. Cândido J, Torres G, Figueiredo I, Morais A, Pinto F, Pinto A, et al. FINDRISK: Estratificação do risco para diabetes mellitus na saúde coletiva. Rev Bras Promoç Saúde. 2017,30(3):1-8. http://dx.doi.org/10.5020/18061230.2017.6118
12. Sánchez-Jiménez B, Chico-Barba G, Rodríguez-Ventura AL, Sámano R, Veruete-Bedolla D, MoralesHernández RM. Risk of development of type 2 diabetes in nurses and its relationship with metabolic alterations. Rev. Latino-Am. Enferm. 2019;27:e3161. https://doi.org/10.1590%2F1518-8345.3002.3161
13. Gomes V, Domingues S. Controlo intensivo da pressão arterial na diabetes mellitus tipo 2: qual a evidência? Rev Port Med Geral Fam. 2018,34:208-18. https://doi.org/10.32385/rpmgf.v34i4.12479

14. Rossaneis M, Haddad M, Mathias T, Marcon S. Diferenças entre mulheres e homens diabéticos no autocuidado com os pés e estilo de vida. Rev. Latino-Am. Enferm. 2016,24:1-8. http://dx.doi.org/10.1590/1518-8345.1203.2761
15. Flor L, Campos M. Prevalência de diabetes mellitus e fatores associados na população adulta brasileira: evidências de um inquérito de base populacional. Rev Bras Epidemiol. 2017,20(1):16-29. https://doi.org/10.1590/1980-5497201700010002
16. Silva J, Haddad M, Rossaneis M, Vannuchia M, Marcon S. Fatores associados à ulceração nos pés de pessoas com diabetes mellitus residentes em área rural. Rev Gaúcha Enferm. 2017,38(3):1-9. https://doi.org/10.1590/1983-1447.2017.03.68767
17. Sousa M, McIntyre T, Martins T, Silva E. Questionário dos Conhecimentos da Diabetes (QCD): propriedades psicométricas. Rev Port Saúde Pública. 2015,33(1):33–41. https://doi.org/10.1016/j.rpsp.2014.07.002
18. Santos S, Bessa H, Mota C. Qualidade de vida e fatores associados na diabetes mellitus tipo 2: estudo observacional. Rev Port Med Geral Fam. 2015,31:186-196. https://doi.org/10.32385/rpmgf.v31i3.11524
19. Rebelo L. Diabéticos fumadores: uma população de elevado risco que muito beneficia em deixar de fumar. Rev Port Med Geral Fam 2021;37:373-6. https://doi.org/10.32385/rpmgf.v37i4.13106
20. Sousa M, Bastos F. Hipertensão e Diabetes – Um cluster, um desafio para promoção da autogestão do regime terapêutico [Internet]. 2021 [acesso a 30 Maio 2022]. Disponível em: https://comum.rcaap.pt/bitstream/10400.26/39532/1/autocuidado_124-142.pdf
21. Nathan D, White W. Treatment of hypertension in patients with diabetes mellitus [Internet]. Up to date; 2017 [acesso em 31 mai 2022]. Disponível em: https://www.uptodate.com/contents/treatment-of-hypertension-in-patients-with-diabetes-mellitus
22. Associação Protetora dos Diabéticos de Portugal (APDP). OMS publica resolução para que países abordem a diabetes como problema de saúde pública [Internet]. Portugal: APDP; 2021 [acesso em 31 mai 2022]. Disponível em: https://apdp.pt/noticias/oms-publica-resolucao-para-que-paises-abordem-a-diabetes-como-problema-de-saude-publica/
23. Barros C. 2020 veio com uma pandemia para lembrar a sociedade moderna da sua vulnerabilidade. Glob Acad Nurs. 2020;1(3):e35: https://dx.doi.org/10.5935/2675-5602.20200035