Degree of risk of diabetic foot in primary health care

Grau de risco do pé diabético na atenção primária à saúde

Grado de riesgo de pie diabético en la atención primaria de salud

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Abstract: Objective: to investigate the risk classification for diabetic foot and associated factors in individuals with diabetes mellitus. **Method:** a cross-sectional study among users followed up in a basic health unit. Data were collected with patients who underwent the nursing consultation through a clinical evaluation form of lower limbs. The analysis was conducted by means of multivariate logistic regression. **Results:** total of 69 participants evaluated, 52.8% presented some degree of risk. There was a higher chance among men, elderly, with reports of pain at rest in the legs and feet, history of ulcer and/or amputations, with nursing diagnosis of "impaired skin integrity in the elderly". **Conclusion:** most of the users evaluated do not have a high risk, but the focus should be on self-care for the prevention of such injury and the clinical examination of lower limbs by nurse.
Descriptors: Diabetes mellitus; Diabetes mellitus type 2; Diabetes complications; Diabetic foot; Nursing process

Resumo: Objetivo: investigar o grau de risco de pé diabético e fatores associados em indivíduos com diabetes mellitus. **Método:** estudo transversal entre usuários acompanhados em uma unidade básica de saúde. A coleta de dados foi feita com os pacientes que realizaram a consulta de enfermagem por meio de um formulário de avaliação clínica de membros inferiores. Conduziu-se a análise por meio de regressão logística multivariada. **Resultados:** dos 69 participantes avaliados, 52,8% apresentaram algum grau de risco. Verificou-se maior chance entre homens, idosos, com relato de dor em repouso nas pernas e pés, histórico de úlcera e/ou amputações, com diagnóstico de enfermagem de "integridade da pele prejudicada no idoso". **Conclusão:** a maioria dos usuários avaliados não possui risco elevado, porém o enfoque deve ser no autocuidado para a prevenção de tal agravo e a realização do exame clínico dos membros inferiores pelo enfermeiro.

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Resumen: Objetivo: investigar el grado de riesgo de pie diabético y factores asociados en individuos con diabetes mellitus. **Método:** estudio transversal entre usuarios seguido en una unidad básica de salud. Se recopilaron datos con pacientes que se sometieron a la consulta de enfermería con una evaluación clínica de las extremidades inferiores. El análisis se realizó mediante regresión logística multivariante. **Resultados:** del total de 69 participantes, el 52,8% presentó algún grado de riesgo. Había una mayor probabilidad entre los hombres, ancianos, con informes de dolor en reposo en las piernas y los pies, antecedentes de úlceras y/o amputaciones, con diagnóstico de enfermería de "integridad de la piel deteriorada en los ancianos". **Conclusión:** la mayoría de los usuarios evaluados no tienen un alto riesgo, pero el enfoque debe estar en el autocuidado para la prevención de tal lesión y el examen clínico de las extremidades inferiores por la enfermera.

Introduction

Diabetes Mellitus (DM) is a relevant public health problem associated with the quality of primary health care (PHC). About 415 million people have DM with a worldwide prevalence of 8.8%. In Central and South American countries, this prevalence was estimated at 26.4 million individuals and projected to 40 million in 2030.[1] Brazil is the fourth country with the highest number of people with DM in the world, and it is estimated that currently 14.3 million Brazilians have the disease. In 2015, there were five million deaths from DM worldwide, with the proportion of one death every six seconds; in 2040, approximately 227 million people are expected to develop the disease.[2]

In its chronic phase, the lack of control of the glycemic profile makes favourable the appearance of several complications, and among the most serious is the development of the diabetic foot, a condition resulting from neuropathy that generates loss of sensitivity, which can lead to the appearance of complex lesions that, if not treated, can cause lower limb amputations.[3] Due to limb involvement, the diabetic foot has been one of the main causes of increased hospitalizations due to primary care sensitive conditions (HPCSC) that affects about 15.0% of individuals with DM.[4]

Complications of diabetic foot account for 40.0% to 70.0% of total lower limb amputations in the general population, and 85.0% of amputations are preceded by ulcerations. This injury, in addition to increasing mortality, modifies the quality of life, reflecting in absenteeism and premature retirements. Most of these cases are preventable with an educational approach or periodic examination of the feet, as they allow timely treatment and prevent the development of complications.[5-6]

It is known, therefore, that the nursing consultation, besides being considered a tool of health education, enables the professional to develop his practice autonomously and resolutely so the nurse performs an important role as a caregiver and educator. It is also the nurse's responsibility to have physical examination of the feet in order to prevent the appearance and injuries related to diabetic foot.[7-8]

This scenario arouses the need for urgent measures to control and prevent DM, as well as their complications.[2] It is opportune to conduct studies and research, considering that, currently, there are a significant number of people living with severe sequelae and reduced life expectancy due to the damage caused by the disease. Considering the severity of its consequences, the data regarding the diabetic foot are minimal in Brazil, and although the examination of the feet is the most effective form of foot tracking at risk, it is still not a routine in most health services.[9] Added to this, there are not enough studies that have addressed the nursing consultation of patients with DM with the identification of the associated factors of diabetic foot. Based on these assumptions, the present study aimed to investigate the classification risk of diabetic foot and associated factors in individuals with DM.

Method

This is a cross-sectional study conducted with people with DM in a basic health unit (BHU) in the Northeast district of Foz do Iguaçu-Paraná State (PR), from February to July 2019.

The municipality is situated at the western end of the State and borders Paraguay and Argentina countries. It has an estimated population of 258,532 inhabitants, especially for tourism, commerce and high flow of people in a region of triple border.[10] The BHU has a total of 3,578 registered patients, of these 209 are people with DM.

The study included users registered and monitored by the health team of the Family Health Strategy who had DM for at least five years, performed nursing consultations during the study period and were undergoing drug treatment for such pathology. The invitation to participate in the study occurred in four ways: telephone contact; invitation through the Community Health Agent (CHA); scheduling during the reception in the BHU; and approach in the educational groups of hypertension and diabetes (HIPERDIA). Losses were those who were not located after three attempts to schedule the nursing consultation, and those who did not attend on the date and time scheduled for the appointment.

To carry out the investigation, the research proposal was presented, and authorization was requested to the Municipal Health Department of the municipality and, after approval by the Research Ethics Committee, the project was presented to the BHU manager and the nurse responsible for the team.

A pilot study was conducted with 10 users to verify and adapt the approach strategies adopted and to clarify possible doubts about the data collection instrument. The individuals evaluated in this stage were included in the research, since there were no changes in the instrument and in the approach strategy.

For data collection, we used the form known as "Clinical evaluation form of lower limbs for prevention of diabetic foot"[11], which was adapted to the local reality, composed of four phases. The adaptation of the instrument was due to the fact that some data and/or tests are not possible to be collected or performed in the studied BHU due to lack of necessary materials and/or data available, such as glycated hemoglobin (Hb A1c) >7.0% in the last 3 tests (it was possible to collect

data only from the last test, since most of the patients did not have data from previous exams), Retinopathy (research with fundoscopy), Nephropathy (research with albuminuria), Evaluation of Vibratory Sensitivity (with 128 Hz tuning fork), Motricity Evaluation and Aquileu Reflex.

The first phase of the instrument is the anamnesis, is composed of items related to the socioeconomic profile: gender (male/female), schooling (years), marital status (with partner/without partner), skin colour (white/brown/black/other), income (in minimum wages - MW). Another part of this phase involves issues related to the pathology under study and risk factors for the development of diabetic foot, which are: inadequate glycemic control in the last test - HbA1c> 7.0% - (yes/no), elderly (>60 years), insulin use (yes/no), use of oral hypoglycemicsis (yes/no), dyslipidemia (hypercholesterolemia, hypertriglyceridemia and HDL-low) (yes/no), hypertension (yes/no), obesity (BMI >30Kg/m2) (yes/no) – for this purpose a digital scale with adult anthropometer of the Welmy model W200A was used, sedentary lifestyle (yes/no), smoking (yes/no), alcohol consumption (yes/no), low visual acuity (yes/no), associated diseases (yes/no), psychosocial factors (denial of the disease, low social level, living alone) (yes/no) and wearing inadequate footwear and/or walking barefoot (yes/no).

The second phase of the instrument consists of items related to the clinical examination and risk classification of the diabetic foot, including general evaluation, such as anthropometric analysis and specific evaluations related to the vascular and neurological system. Pressure sensation was also evaluated with the Semmes-Weinstein monofilament of 10g, thermal sensation using test tubes with hot and cold water, tactile through the use of cotton, painful by touching a toothpick in the lower limbs and based on the results obtained the risk of foot ulceration was classified. The risk classification was based on the guidelines of the Brazilian Diabetes Society 2013-2014, as follows: risk degree 0 (patient without loss of plantar protective sensitivity (PSP), without peripheral obstructive arterial disease (PAD) and without deformities),

risk grade 1 (PSP + deformities), risk grade 2 (PSP + PAD) and grade 3 (patient with ulcer and/or previous amputation).[12]

Phase three contained a list of ten questions with dichotomous answers, yes or no, that evaluated how the patient treated his feet, such as foot inspection, the use of appropriate socks and footwear, the hygiene and hydration of the feet, the care with the cutting of nails and the prevention of injuries.

Phase four, which included the guidelines to be followed by the patients, was used in a folder format delivered to patients at the end of the consultations, and nursing diagnoses were included in this field according to the International Classification of Collective Health Nursing Practices (CIPESC®), according to the evaluation and condition of each patient.[13]

Data collection occurred during nursing consultations and lasted, on average, 40 minutes each, by the BHU researcher, at the day and time agreed with the patient for the feet evaluation, by filling in the evaluation form of the lower limbs, and subsequent risk rating. At the end of the consultations, the users received a booklet containing information about the necessary care to avoid the appearance of problems in the lower limbs.

Data were tabulated in the *Microsoft Excel 2010* program and subsequently evaluated using the Bioestat 5.0 software from the Federal University of Pará (UFPA). The risk classification of diabetic foot in phase 2 of the instrument was classified as absent (grade 0) and present (grade 1, 2 and 3), considered the dependent variable of the study. The association between the dependent and independent variables was initially verified by the chi-square test (χ2) and followed by the final model adjustment by means of multiple logistic regression, with a significance level of 5% performed with all independent variables that met the entry criteria ($p < 0.20$) in ascending order to compose the final multivariate model. Only remained the variables with $p < 0.05$, or those that changed the odds ratio (OR) in at least 10%. The

measurement of the magnitude of effect was verified by the OR values, and respective confidence intervals (95% CI).

The investigation respected the ethical standards of research involving human beings of Resolution No. 466/2012 of the National Health Council/Ministry of Health. For each participant, the objectives of the research were informed, and the data obtained would be used exclusively for scientific purposes, ensuring confidentiality, privacy and anonymity of the participant. The participation was made by signing the Free and Informed Consent Form. This research was approved by the Ethics and Research Committee of the Dinâmica das Cataratas under opinion no. 3,168,543 with CAAE no. 07442919.4.0000.8527 on February 25, 2019.

Results

Sixty-nine people with DM registered by the health team participated in the study and met the inclusion criteria. In this study, the losses were those not found after three attempts to perform the nursing consultation (27). Only two people did not accept to participate in the research.

Regarding the profile of the participants, it was found that the majority were female (57.9%; 95% CI: 46.3; 69.5), non-brown skin colour (59.4%; 95% CI: 47.8; 71.0), lived with a partner (62.3%; 95% CI: 50.9; 73.7), retired (57.9%; 95% CI: 46.3; 69.5), family income of 02 Mw or more (50.7%; 95% CI: 38.9; 62.5), schooling older than 08 years (85.5%; 95% CI: 77.2; 93.8), with DM less than 05 years (72.4%; 95% CI: 61.9; 82.9), do not use insulin (63.7%; 95% CI: 52.4; 75.0), use oral hypoglycemic (97.1%; 95% CI: 93.1; 101.1) and presence of other diseases (85.5%; 95% CI: 77.2; 93,8).

Regarding glycemic control, 56.5% (95%CI: 44.8; 68.2) had the last test with inadequate control (Hb A1c > 7.0%), 72.4% (95%CI: 61.9; 82.9) of the interviewees were elderly, 63.7% (95% CI: 52.4; 75.0) had dyslipidemia, 79.7% (95% CI: 70.2; 89.2) were hypertensive, 53.6% (95%CI: 41.8; 65.4) had BMI >30Kg/m2, a total of 63.7% (95% CI: 52.4; 75.0) were sedentary, most reported not being smokers (94.2%; 95% CI: 88.7; 99.7) neither alcoholic (98.5% ; 95% CI: 95.6; 101.4), most of

the interviewees reported having low visual acuity (84.0% ; 95% CI: 75.3; 92.7), the majority (75.3% ; 95% CI: 65.1; 85.5) had no psychosocial risk factors, and 72.4% (95%CI: 61.9; 82.9) used inappropriate footwear and/or walked barefoot.

Table 1 shows the risk classification for the development of diabetic foot in phase 2 of the instrument. Of the participants, 47.9% were classified at risk level 0, followed by patients with risk grade 1 (39.1%), risk grade 3 (7.2%), and 5.8% classified as at risk grade 2. Only participants with risk classification 3 declared receiving guidance regarding care for their lower limbs and had been previously evaluated by a health professional.

Table 1 – Diabetic foot risk classification, Foz do Iguaçu, 2019.

Variable	n	%
Classification 0	33	47.9
Classification 1	27	39.1
Classification 2	4	5.8
Classification 3	5	7.2

In phase 3 of the instrument, aspects related to self-care for the lower limbs were evaluated. Of the participants evaluated, 53.6% stated that they examined their feet daily for alterations, 82.6% reported walking barefoot or used slippers with straps between their fingers, and 75.3% of the interviewees reported paying attention to the places where they walk in order to avoid foot injuries.

Table 2 informs the multivariate analysis that statistically associated, in phase 1 of the instrument, with gender variables with emphasis on men and higher chance of diabetic foot among the elderly. In this same phase, individuals with resting pain in the legs and feet and with the presence of ulcers and/or amputations were more likely to have a diabetic foot.

Table 2 – Multivariate analysis of diabetic foot assessments, Foz do Iguaçu, 2019.

Variable	OR	IC$_{95\%}$	p
Sex			
Female	1		
Male	5.02	1.49; 16.83	0.009
Elderly (> 60 years)			
No	1		
Yes	7.70	1.73; 34.24	0.007
Pain at rest in the legs or feet			
No	1		
Yes	8.14	1.21; 54.85	0.031
Ever had ulcer or amputation of your feet			
No	1		
Yes	6.78	1.23; 37.36	0.028
Impaired skin integrity in the elderly			
No	1		
Yes	4.70	1.14; 19.37	0.032

In phase 3 of the instrument there was no variable with statistical significance for the development of diabetic foot. In phase 4, individuals with nursing diagnosis of "Impaired skin integrity in the elderly" (OR: 4.70; 95% CI: 1.14; 19,37; p=0.032) showed a higher chance of diabetic foot.

Discussion

The findings of this study showed that pain at rest in the legs and feet, and the presence of ulcers and/or amputations are factors associated with the development of the diabetic foot. Most of the users evaluated do not have a high risk for the development of such pathology, however, the focus should be on self-care for the prevention of such a disease. The PHC is the gateway, coordinator, and controller of the health care network, can play a fundamental role in reducing possible complications, and in this scenario, nurses have to evaluate the foot in order to recognize risk factors, aiming to reduce the incidence of diabetic foot and amputations.[6]

In this study, most people with DM had other comorbidities, such as hypertension and dyslipidemia, and inadequate glycemic control, which points to the need for greater follow-up of PHC as an ordering of care in the health care network. People with DM should be monitored and inserted in care routines and health education actions, aiming to empower themselves for self-care.[6]

Data analysed showed that 47.9% of the patients evaluated were classified as at risk level 0. A similar fact can be observed in a study conducted in São Paulo (SP): although the author classified the risk of developing diabetic foot in different grades, 1, 2, 3, and 4, where grade 1 corresponds to the risk degree 0, the present study showed that 66.0% of the evaluated patients were classified as risk degree 1.[2]

Only those classified as risk degree 3 (7.2%) declared receiving guidance to care for the lower limbs, and had their feet evaluated by a health professional, since they were already under specialized follow-up due to amputations and/or ulcers in the lower limbs. This finding points to the lack of guidance for the patient's self-care regarding the prevention of diabetic foot, considering that those patients who presented the risk level 0, 1, and 2, did not receive any guidance. An investigation conducted in the State of Ceará, with the aim of evaluating the knowledge of patients with type 2 DM in relation to self-care with their feet, found that 49.8% had inadequate knowledge showing that they follow guidelines in a fragmented way not knowing the risks associated with the behaviours adopted.[14]

Other aspects found in this investigation indicated that the elderly and men were more likely to develop diabetic foot. This fact corroborates with research conducted in Belo Horizonte (Minas Gerais State) and in a large municipality in Southern Brazil in which they observed that advanced age has been a risk factor for increased mortality in people with DM. Regarding self-care, men presented higher deficits compared to women.[15-16]

In addition to the higher prevalence of chronic diseases, the elderly present a particular condition of worsening health conditions resulting from pathophysiological processes of

aging.[17] When it comes to health care, it is observed that men are more susceptible to the onset of chronic non-communicable diseases (NCDs) and live, on average, seven years less than women. This fact has been mainly associated with the resistance of the male population to seek preventive health care.[18]

Individuals who presented as the main symptom resting pain in legs or feet showed a higher chance of diabetic foot. This occurrence represents a health problem due to its chronic characteristic, which can generate functional disability directly affecting life quality. In general, people with DM with neuropathic pain have greater impairment in general activities, and may cause depression, anxiety, including sleep, and rest disorders.[19-20] This symptom may also be due to atherosclerosis that often occurs in people with DM as it generates tissue hypoxia in the lower limbs.[21] A case study conducted in João Pessoa, State of Paraíba (PB) showed that the nursing diagnosis "Intense pain in lower limbs" was an always constant phenomenon.[17]

The history of ulcers and / or previous amputations in the feet was also shown to be an associated factor for the development of the diabetic foot. Retrospective longitudinal study conducted in Rio Grande do Sul, which evaluated the changes in the feet of people with DM, showed that patients with ulcers and amputations had a significant risk for mortality.[22] Investigation conducted in Santa Catarina, Paraná State, that estimated the disease burden for amputations of lower limbs attributable to DM, revealed that men suffered more lower limb amputations when compared to women, and lost more years of healthy life due to the amputation.[23]

Among the complications of DM, diabetic neuropathy stands out as the most common, making the feet one of the regions of the body most vulnerable to the development of ulcers, being a risk factor, considering that 85.0% of the amputations in people with DM are due to previous ulcers.[2,4,24]

Regarding the nursing consultation with people with DM, it is noteworthy that this is a private activity of nurses that allows them to exercise their role as health educator, clarifying

doubts, guiding, promoting care, and providing the patient with knowledge, thus contributing to the prevention of diseases from chronic diseases.[24] Thus, nursing appointment together with the prescription of care is an indispensable activity for the recognition of health risks, since it provides nurses with the planning of their care.[6]

Among the nursing diagnoses classified according to the CIPESC® it was detected that those who presented "Impaired skin integrity in the elderly" had a 4.70 chances of developing the diabetic foot than patients who did not present this diagnosis. This finding corroborates with a study conducted with elderly people with DM in a UBS in Candido Sales, State of Bahia, that showed that the diagnosis "Risk of impaired skin integrity" was verified in all study participants, also being identified the effective diagnosis of "Impaired skin integrity" in some elderly evaluated. It is necessary that the nursing professional knows how to evaluate the lower limbs of patients and guide them to the necessary care, since the integrity of the skin, especially of the elderly diabetics, is impaired.[25]

A limitation of this research refers to the fact that the methodology used does not allow to verify the duration of complications related to diabetic foot among the respondents, but only to identify its presence or absence. From this perspective, this study has no generalization power to evaluate the care of people with diabetes in other realities. Nevertheless, it is believed that it contributes in the area of DM and nursing by presenting the factors that are associated with diabetic foot that were identified from a private activity of the nurse in the nursing appointment. This investigation points to the potential of nurses' action in detecting factors associated with chronic conditions, such as DM in PHC.

Conclusion

Elderly men had a higher risk of developing complications due to decompensated DM. The history of ulcer and/or anterior amputations and the presence of pain at rest in legs or feet also proved to be factors associated with diabetic foot.

The absence of evaluation of the lower limbs of people with DM in PHC was detected, which may imply future complications of DM due to lack of guidance and follow-up.

This finding points to the importance of performing the clinical examination directed to the lower limbs during the nursing activities developed in PHC, as in addition to detecting possible problems, it makes possible to individuals to take care in the prevention of diabetic foot, since this problem leads to the reduction of autonomy and self-esteem causing an impact on the individual's life quality, besides reducing work capacity and life expectancy.

In this study, it was not possible to understand which guidance and health education actions people with DM received or participated in. The attention levels and / or other points in the health care network that provided educational guidelines were also not identified. Future investigations, however, are recommended to address these aspects.

References

1. Ministério da Saúde (BR). Estratégias para o cuidado da pessoa com doença crônica: diabetes mellitus. Brasília (DF): Ministério da Saúde; 2013. (Caderno de Atenção Básica; 36).

2. Lucoveis MLS, Gamba MA, Paula MAB, Morita ABPS. Degree of risk for foot ulcer due to diabetes: nursing assessment. Rev Bras Enferm. 2018;71(6):3041-7. doi: https://doi.org/10.1590/0034-7167-2017-0189

3. Fernandes O, Oliveira P, Pinto CC. The effectiveness of negative pressure therapy for the treatment of diabetic foot wound: an umbrella study. Rev Rol Enferm [Internet]. 2020 [acesso em 2020 mar 07];43(1):405-13. Disponível em: https://comum.rcaap.pt/bitstream/10400.26/31607/1/405-413.pdf

4. Figueiredo EOC, Barros FO, Santos EF, Pimentel TS, Góis CFL, Otero LM. Avaliação do grau de risco para pé diabético em indivíduos com diabetes mellitus tipo 2. Rev Enferm UFPE On Line [Internet]. 2017 [cited 2019 Aug 12];11(Suppl 11):4692-9. Available from: https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/231211

5. Ministério da Saúde (BR). Manual do pé diabético, estratégias para o cuidado da pessoa com doença crônica. Brasília (DF): Ministério da Saúde; 2016.

6. Nascimento MT, Silva NIO, Brito FCBA, Fontes FLL, Oliveira AF, Oliveira JVA, et al. Fatores de risco associados ao desenvolvimento do pé diabético e ações executadas na Atenção Primária à Saúde para prevenção do agravo. Rev Eletrônica Acervo Saúde. 2019;(33):e1371. doi: https://doi.org/10.25248/reas.e1371.2019

7. Silva KM, Santos SMA. A consulta de enfermagem na estratégia saúde da família: realidade de um distrito sanitário. Rev Enferm UFSM. 2016;6(2):248-58. doi: https://doi.org/10.5902/2179769218079

8. Feitosa TF, Dantas MQS, Silva CB, Pereira A. Monofilament for preventing the diabetic foot: an integrative review of the literature. Online Braz J Nurs [Internet]. 2016 [cited 2019 Aug 03];15(2):291-301. Available from: http://www.objnursing.uff.br/index.php/nursing/article/view/5277/html

9. Gomes LC, Silva Júnior AJ. Fatores favoráveis ao pé diabético em usuários de uma unidade de atenção primária à saúde. Rev Atenção Saúde. 2018;16(57):5-12. doi: https://doi.org/10.13037/ras.vol16n57.4943

10. Instituto Brasileiro de Geografia e Estatística (IBGE). Cidades IBGE. 2019 [acesso em 2019 nov 08]. Disponível em: https://cidades.ibge.gov.br/brasil/pr/foz-do-iguacu/panorama

11. Mello R, Pires M, Kede J. Ficha de avaliação clínica de membros inferiores para prevenção do pé diabético. Rev Pesq Cuid Fundam [Internet]. 2017 [cited 2020 May 25];9(3):899-913. Available from: http://www.seer.unirio.br/index.php/cuidadofundamental/article/view/5468

12. Boulton AJM, Armstrong D, Albert S, Fryberg R, Hellman R, Kirkman M, et al. Comprehensive foot examination and risk assessment. Diabetes Care. 2008;31(8):1679-85. doi: https://doi.org/10.2337/dc08-9021

13. Albuquerque LM, Cubas MR. CIPESCANDO em Curitiba: construção e implementação da nomenclatura de diagnósticos e intervenções de enfermagem na Rede Básica de Saúde. Curitiba: ABEn; 2005.

14. Oliveira Neto M, Pereira MS, Pinto MAH, Agostinho LM, Reinaldo Júnior FE, Hissa MN. Avaliação do autocuidado para prevenção do pé diabético e exame clínico dos pés em um centro de referência em diabetes mellitus. J Health Biol Sci (Online). 2017;5(3):265-71. doi: http://dx.doi.org/10.12662/2317-3076jhbs.v5i3.1092.p265-271.2017

15. Cardoso NA, Cisneros LL, Machado CJ, Procópio RJ, Navarro TP. Fatores de risco para mortalidade em pacientes submetidos a amputações maiores por pé diabético infectado. J Vasc Bras (Online). 2017;17(4):296-302. doi: https://doi.org/10.1590/1677-5449.010717

16. Rossaneis MA, Haddad MCFL, Mathias TAF, Marcon SS. Differences in foot self-care and lifestyle between men and women with diabetes mellitus. Rev Lat Am Enferm (Online). 2016; 24:e2761. doi: https://doi.org/10.1590/1518-8345.1203.2761

17. Nogueira LGF, Medeiros ACT, Bittencourt GKGD, Nóbrega MML. Diagnósticos, resultados e intervenções de enfermagem ao idoso diabético: estudo de caso. Online Braz J Nurs [Internet]. 2016 [cited 2019 Aug 08];15(2):302-12. Available from: http://objnursing.uff.br/index.php/nursing/article/download/4964/pdf

18. Lemos APF, Ribeiro C, Fernandes J, Bernardes K, Fernandes RTP. Saúde do homem: os motivos da procura dos homens pelos serviços de saúde. Rev Enferm UFPE On Line [Internet]. 2017 [cited 2019 Oct 13];11(Suppl 11):4645-62. Available from: https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/231205

19. Cortez J, Reis C, Cardoso Y, Onofre A, Piovezan AP. Prevalência de dor neuropática e fatores associados em portadores de diabetes mellitus tipo 2 atendidos em ambulatório médico. Rev Dor. 2014;15(4):256-9. doi: https://doi.org/10.5935/1806-0013.20140055

20. Girach A, Julian TH, Varrassi G, Paladini A, Vadalouka A, Zis P. Quality of life in painful peripheral neuropathies: a systematic review. Pain Res Manag. 2019; 2019:2091960. doi: 10.1155/2019/2091960

21. Maldonado CM, Silva ACR, Pereira KA, Silva EMA, Oliveira JRC, Faria RS, et al. Associação entre fatores de risco cardiovasculares e a presença de doença arterial coronariana. Arch Med (Manizales). 2019;19(2):247-25. doi: https://doi.org/10.30554/archmed.19.2.3105.2019

22. Scain SF, Franzen E, Hirakata VN. Riscos associados à mortalidade em pacientes atendidos em um programa de prevenção do pé diabético. Rev Gaúcha Enferm. 2018;39:e20170230. doi: https://doi.org/10.1590/1983-1447.2018.20170230

23. Santos KPB, Luz SCT, Mochizuki L, d'Orsi E. Carga da doença para as amputações de membros inferiores atribuíveis ao diabetes mellitus no Estado de Santa Catarina, Brasil, 2008-2013. Cad Saúde Pública. 2018;34(1):e00013116. doi: http://dx.doi.org/10.1590/0102-311x00013116

24. Oliveira PS, Bezerra EP, Andrade LL, Gomes PLF, Soares MJGO, Costa MML. Atuação dos enfermeiros da estratégia saúde da família na prevenção do pé diabético. Rev Pesq Cuid Fundam [Internet]. 2016 [cited 2019 Oct 04];8(3):4841-9. Available from: http://www.seer.unirio.br/index.php/cuidadofundamental/article/view/4398

25. Lacerda NFRS, Lima PV. Diagnósticos de enfermagem identificados em pessoas idosas com diabetes mellitus. ID On Line Rev Psicol [Internet]. 2017 [acesso em 2019 set 23];11(38):431-44. Disponível em: https://idonline.emnuvens.com.br/id/article/view/908/0

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1 – Patricia Simon da Silva

Principal author carried out her work of completion of residence, which gave basis to the article. Author supported the conception and planning of the research project, field data collection, development and analysis of the data, as well as final writing of the article.

2 – Cassandra Severo Amaral Vieira

Co-worker, supported design and planning of the research, and data collection proposal.

3 – Ludmila Mourão Xavier Gomes

Supported and participated in the design and planning of the research, analysis and interpretation of the data, and final writing of the article.

4 – Thiago Luis de Andrade Barbosa

Adviser, supported the conception and planning of the research, guided the data collection, performed statistical analysis and review of Portuguese, as well as critical review of the article.

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