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Diabetic foot: Evaluation and preventive practices of nurses in family health strategy

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ABSTRACT
Systematic evaluation of the feet is essential in identifying risk factors and reducing the chances of ulceration and amputation. The objectives of this study were to evaluate the preventive practices performed by nurses during the nursing consultation and to examine the feet of diabetic patients. This is a quantitative study carried out in the Family Health Strategy Units, in the interior of São Paulo. For data collection, a structured script was used to evaluate the diabetic patient and a questionnaire regarding the preventive practices used by the nurse during the nursing consultation. The most frequent alterations presented by the patients were: inadequate shoes (65%), ineffective hydration (60%), skin alteration (95%), signs indicative of mycosis (55%), loss of protective sensitivity (35%) and loss of vibratory sensitivity (45%). The preventive practices performed by the nurses were: assessment of nutritional status (62.5%), measurement of systemic blood pressure (43.8%), glycemic control (87.5%), skin inspection (62.5%), nail trimming (50%), type of footwear (62.5%). Most nurses did not perform the monofilament test (81.2%) or the vibratory sensitivity test (93.7%). Nurses play an important role in the early detection of risk factors, but it is not yet a practice incorporated by everyone.

Keywords: Diabetes Mellitus, Diabetic foot, Primary prevention, Family Health Nurses.

1 INTRODUCTION

Type 2 Diabetes Mellitus (DM2) is a chronic non-communicable, degenerative disease that affects the pancreas and makes it unable to secrete insulin produced by the body. It is estimated that by 2045 the world will have 628.6 million people with diabetes. This disease can lead to microvascular complications such as Diabetic Retinopathy, Diabetic Nephropathy and Diabetic Neuropathy (DN) and macrovascular complications such as Coronary Artery Disease and Stroke (SBD GUIDELINES 2018-19).

The main chronic complication is DN, with peripheral diabetic neuropathy (DPN) being its most common form. It is present in 50% of patients with T2DM over 60 years of age (ROLIM, et al. 2022). DPN is a "diffuse, symmetrical, distal and progressive lesion of the sensory-motor and

autonomic fibers, caused by chronic hyperglycemia and cardiovascular risk factors" (ROLIM, et al. 2009). In many cases, it is asymptomatic for many years and is the most important factor for the appearance of diabetic ulcers, considered difficult to treat and with little chance of recovery and, for this reason, preventive actions are extremely important (ZÖRRER, et al. 2022).

Prevention is essential to reduce the chances of ulceration and amputation, and is done through the systematic evaluation of the feet. The patient's clinical history, history of ulcerations or amputations, social status, and ability to perform foot self-care should be investigated (VARGAS, et al. 2017). To reduce the burden of the disease, the International Working Group on Diabetic Foot (IWGDF) recommends adopting strategies that include elements for prevention, patient and staff education, multidisciplinary treatment, and close monitoring (IWGDF Guidelines, 2019).

Diabetic foot is named when there is the presence of infection, ulceration, and/or destruction of deep tissues associated with neurological abnormalities and varying degrees of peripheral vascular disease in people with DM (IWGDF Guidelines, 2019), in addition to loss of plantar protective sensation (PSP). In a systematic review, the overall prevalence of diabetic foot was 6.3% (Zhang P, et al. 2017), in addition to being responsible for more hospital admissions than any other long-term complications observed in patients with DM (SBACV-SP, 2020). Thus, understanding the causes of these problems allows for early recognition of high-risk patients.

The literature recommends that health professionals examine the feet of diabetic patients for early detection of risk, in addition to encouraging the development of skills for self-care, which include, for example, shoe conditions and hygiene habits. In addition to screening to identify typical symptoms (allodyne, autonomic changes, burning sensation at the site of pain, paroxysmal pain, dysesthesia, worsening with rest) (ZÖRRER, et al. 2022), loss of sensitivity should be evaluated by simple and easy methods such as: pressure perception (Semmes-weinstein monofilament test), deep sensation (Achilles tendon reflex test with the use of a hammer) and vibration perception (tuning fork test), in addition to vascular evaluation through palpation of the pedal and posterior tibial pulses (BRASIL, 2016). Ideally, a methodology that has the capacity to assess both fine nerve fibers (including thermal and painful sensitivity and sudomotor function) and gross nerve fibers (tendon reflexes, vibratory and tactile sensitivity) is ideal for evaluating both fine nerve fibers (including thermal and painful sensitivity, and sudomotor function) (SBACV-SP, 2020).

The Ministry of Health's Plan for the Reorganization of Arterial Hypertension *and Diabetes Mellitus* Care refers to the nurse's attribution as "the development of educational activities for health promotion, individually or in groups, with hypertensive and diabetic patients" (BRASIL, 2001). However, one study pointed out that nurses' knowledge about the care of people with DM is partial, superficial and fragmented, not allowing adequate actions for care, especially in the detection of risks for the development of diabetic foot and to perform the evaluation of the foot examination (VARGAS,

et al. 2017), in another, important guidelines such as the daily examination of the feet are lacking (CUBAS, et al. 2013) and 96% of patients with dermato-neuro-functional risk factors have never had their feet examined with the Semmes Weinstein monofilament (LUCOVEIS, et al. 2018).

From this perspective, this study aimed to evaluate the preventive practices performed by nurses during the nursing consultation and to examine the feet of diabetic patients.

2 METHODS

This is a descriptive and exploratory study with a quantitative approach, carried out in the Family Health Strategy Units (FHU) of the neighborhoods: Aparecidinha, Vila Sabiá, Wanel Ville and Habiteto, in the city of Sorocaba, in the interior of the state of São Paulo. The sample consisted of nurses whose inclusion criterion was to have performed nursing consultations with patients in the Adult Program and patients with a medical diagnosis of DM2, aged over 40 years, registered in the program and who had participated in at least one nursing consultation. After the study was approved and the Informed Consent Form (ICF) was signed, the study was conducted.

Data collection was carried out between January and March 2017, in two phases. In the first stage, the nurses were given a structured questionnaire with questions related to the tracking of preventive practices, including nutritional assessment, glycemic and blood pressure control, physical examination of the feet (skin, nail trimming, hygiene, types of footwear, wrists, joints, presence of calluses and deformities, tactile, thermal, painful and vibratory sensitivity tests). In the second, the physical examination of the diabetic patient's foot was performed during individual or collective care by the academic researchers under the supervision of the professors, using the questionnaire adapted CUBAS (2013) to assess the diabetic foot.

A descriptive analysis of the data was performed using the frequency, in absolute values (n) and percentage (%), for the categorical variables, and of the measures of position and dispersion (mean and standard deviation) for the continuous variables.

The Research Project was approved by the Research Ethics Committee (REC) of the Faculty of Medical and Health Sciences of the Pontifical Catholic University (FCMS-PUC/SP), n° 1.537.922 and 2.011.685, in accordance with Resolution No. 466/2012 of the National Health Council and the guidelines and regulatory standards for research involving human beings.

3 RESULTS

3.1 RELATED TO THE PREVENTIVE ACTIONS OF NURSES

The sample consisted of 16 nurses, with a mean age of 33.2 years (± 7.5), time since graduation of 7.8 years (± 6.7) and 7.3 years of profession (± 6.7). Slightly more than half of the nurses provided

guidance on the correct type of footwear (56.2%) and only a portion of them felt qualified to perform the nursing consultation on diabetic patients (37.5%). Preventive practices are shown in Table 1.

Table 1. Preventive practices of the nurse during the nursing consultation with diabetic patients. Sorocaba, 2017 (N=16)

Patient Assessment by the Nurse	n*	%**
Nutritional status	10	62,5
Systemic blood pressure in the sitting position	07	43,8
Glycemic control	14	87,5
Skin Inspection	10	62,5
Inspection of the Lower Limbs	11	68,7
Joint Inspection	06	37,5
Cut of the nails	08	50,0
Type of footwear	10	62,5
Monofilament Test	03	18,8
Vibration Test (Tuning Fork)	01	6,3
Patient's knowledge of the disease	12	75,0

*n: absolute number; **%; frequency

3.2 RELATED TO NURSING CONSULTATION IN DIABETIC PATIENTS

The sample consisted of 20 diabetic patients, 60% of whom were female, with a mean age of 61.3 years (± 8.9), average schooling of 4.5 years (± 1.2) years and time of diagnosis of the disease reported by the patient of 8.6 years (± 6.9), use of oral hypoglycemic agents (80%). They had systemic arterial hypertension (55%), obesity (40%) and overweight (35%). Regarding lifestyle, they followed the recommended diet (30%) and performed physical activity three times a week (10%). The most frequent alterations evaluated during the examination of the feet were: inadequate shoes, ineffective hydration, skin alteration and signs indicative of mycosis. None of the patients were classified as at high risk for developing ulcers (Table 2).

Table 2 - Evaluation of the Diabetic Patient (n=20). Sorocaba, 2017.

Variables	**n***	**%****
Sign of Prayer with Hands		
No limitations	20	100,0
Hygiene		
Good hygiene	11	55,0
Regular	05	25,0
Irregular	04	20,0
Type of Footwear		
Open	13	65,0
Closed	07	35,0
Sock type and color		
White Cotton	02	10,0
Black Cotton	03	15,0
No socks	15	75,0
Hydration		
Areas of dryness	12	60,0
Cracks	08	40,0
Skin (Color)		
Changed	19	95,0
Normal	01	5,0
Pele (Temperature)		
Normal	11	55,0

Propose	06	30,0
Hot	03	15,0
Skin (Edema)		
Absent	14	70,0
Present	06	30,0
One		
Challenge Cut	12	60,0
Properly sanded	09	45,0
Moisture between fingers	01	5,0
Signs and Symptoms Indicative of Ringworm	11	55,0
Sensitivity (Monofilament)		
Preserved	13	65,0
Sensitivity (Tuning Fork)		
Preserved	11	55,0
Bone deformities/prominence	18	90,0
Wrists		
Tibial - non-palpable	20	100,0
Pedious - not palpable	15	75,0
Risk Classification		
Risk-Free	13	65,0
Low Risk	07	35,0

* n: absolute number; **%: frequency

4 DISCUSSION

Although the evaluation of the feet is essential for diabetic patients, in this study, it was observed that it is not a practice incorporated by all nurses. According to Lira, et al. (2020), this assessment is essential in identifying risk factors and reducing the chances of ulceration and amputation. In this study, it was observed that 86% of the patients with DM treated in primary care had never undergone clinical examination of the feet, 65.3% had dry skin, and 82.8% had no deformities.

The International Working Group on Diabetic Foot recommends that the assessment should address five elements: identification of the foot at risk, regular inspection and examination of the foot, education of the patient, family and health care providers, ensuring the use of appropriate shoes, and treatment of risk factors for ulceration, as part of integrated care for people at high risk of ulceration (IWGDF Guidelines, 2019). The nurse should also encourage a proactive attitude towards self-care (VARGAS, et al. 2017).

Most studies emphasize regular examination of the feet by nurses with the use of the necessary materials or instruments. However, health professionals still pay little attention to this care. One study pointed out that 96% of diabetic patients have never had their feet examined with Semmes Weinstein's monofilament (LUCOVEIS, et al. 2018).

Nurses play an important role in the screening of patients with DM and in the prevention of diabetic foot. This evaluation begins with the identification of the patient at risk, through detailed clinical examination with physical evaluation, measurement of distal pulses, and investigation of neuropathy by means of sensitivity tests (SANTOS, et al. 2011). In primary care, it can be achieved with simple and cost-effective measures, by anamnesis and evaluation of the loss of protective

sensitivity and examination of the distal pulses for risk classification, in order to determine the type of intervention needed (SANTOS, et al. 2013). Evaluation using the 10g Semmes-Weinstein monofilament and the 128Hz tuning fork is an unsophisticated test and sufficient for the identification of neuropathy (IWGDF Guidelines, 2019). The investigation of the distal pulses (tibial posterior and pedious), on the other hand, does not require any instruments, but only the knowledge and skill of palpation. In addition to educational activities that help patients adhere to treatment.

Therefore, health professionals working in Family Health Units must act comprehensively and competently with patients with chronic diseases, especially patients with DM. These professionals should promote and encourage health action in order to increase patients' self-esteem and autonomy (VARGAS, et al. 2017).

In the evaluation of the diabetic patient, the Age and time since diagnosis of the disease are considered a risk factor for several complications. The longer the time of diagnosis, the higher the risk of developing complications, such as foot ulcers (THOMAZELLI, et al. 2015), in addition to amputations (LIRA, et al. 2020). Another study pointed to complications five years after the diagnosis of DM2 (PRZYSIEZNY, et al. 2020).

The results of this study draw attention to this age group and place it as one of the priorities for health surveillance, considering the aging of the population associated with unfavorable socioeconomic and nutritional conditions. Thus, the Family Health Program team, especially nurses, should consider this group of the population as the focus of preventive measures.

Schooling is another factor that can be considered a risk factor, as it interferes with self-care. The low level of education has repercussions on the self-care of patients at risk for the development of diabetic foot, requiring special attention from nurses when providing guidance for preventive care (SANTOS, et al. 2011). This reinforces the importance that health professionals should involve patients as subjects of self-care and, when carrying out health education actions, provide guidance in a simple way, valuing and respecting patients with the disease and their limitations (BRAGANÇA, et al. 2010).

The study by Santos, et al. (2013) demonstrated that patients with low schooling (M=4.09 years) have a higher risk of amputation. Thus, the low level of education of diabetic patients imposes on nurses the challenge of implementing specific and individualized strategies to improve the self-care of this target population.

The glycemic index is another factor to consider. Blood glucose levels above 126mg/dl represent a significant factor in determining amputations5, which worsens as people have a longer duration of illness and lower glycemic control (CISNEROS, et al. 2011). A study developed by Santos, et al. (2013) pointed out that 54.8% of patients who underwent amputation reported not having undergone an exam.

Hypertension was the most prevalent comorbidity. A Brazilian study suggests that this pathology, when associated with smoking, sedentary lifestyle, and dyslipidemias, favors the impairment of macrocirculation and increases the risk for the development of foot ulcers (PRZYSIEZNY, et al. (2020). Arterial hypertension represents a risk for the onset of chronic complications, such as the development of diabetic neuropathy, especially when associated with other factors such as coronary artery disease, obesity, and dyslipidemia (SBACV-SP, 2020).

Regarding lifestyle, most of them did not practice any physical activity and most of them were overweight. A similar result was demonstrated in the study conducted in Goiás, in which a sedentary lifestyle and overweight were present in 54.8% of the patients (OLIVEIRA, et al. (2016). Lifestyle modification, concomitant with regular physical activity, are important factors in weight loss, as well as in the maintenance of this loss (SBD GUIDELINES 2022-2023). However, the number of people with altered nutritional profile has been growing throughout the country, as a result of changes in lifestyle, especially poor eating habits and a sedentary lifestyle (MEDEIROS, et al. (2016). Excess weight causes an excessive overload on the lower limbs, which has a pressure effect on the plantar region and increases the risk of developing injuries.

In the evaluation of the feet of diabetic patients, the items that drew attention were: inadequate shoes, ineffective hydration, skin alteration and signs indicative of mycosis. A study identified the inadequacy of footwear in 100% of people with DM (LUCOVEIS, et al. 2018). Low adherence to the use of closed shoes is a frequent problem in diabetic patients and reveals the lack of knowledge about the risk of injury. The use of Inadequate footwear increases the pressure on the feet and the risk of ulceration, associated with greater difficulty in healing that can progress to amputations.

Regarding foot hygiene and hydration, most patients had dry feet. Proper hygiene with daily cleaning with soap and water, correct drying with greater attention between the fingers, are precautions that help prevent mycosis. In addition, inadequate nail trimming was observed.

In this study, 35% of the patients had PSP of the feet. This result characterizes a higher probability of developing diabetic foot, which can be aggravated by inadequate foot care. PSP is the key factor in the development of ulcerations and greater vulnerability to trauma (such as wearing inappropriate footwear, falls, inadequate nail trimming, walking barefoot), conferring a seven-fold increased risk (SBD GUIDELINES 2022-2023).

In view of the results of this study, it was proposed training of nurses for the neurological and vascular assessment of diabetic patients. The training took place in 04 moments: Evaluation of previous knowledge, group sensitization, simulated practice, and evaluation of knowledge after training. Were 43 Primary Care nurses were trained. Most of them were unaware of the instruments used to assess the sensitivity of the diabetic foot. With the dynamics carried out, from the simulated practice, It was possible to integrate theoretical/practical knowledgeDoing the physical examination of diabetic

patients invited and enrolled in the Program. The nurses showed interest in using the instruments and performing the clinical examination of the foot. An important question was the lack of instruments (monofilament and tuning fork) in the Units. In view of this, we tried to guide other forms, also considered appropriate, for neurological evaluation and that could be used during the nursing consultation. For example, the replacement of monofilament by cotton wad (SILVA, et al. 2014).

During the nurses' sensitization, the importance of prevention, through a complete and efficient physical examination, in order to reduce the resulting complications and improve patients' quality of life. Is It is essential to sensitize health professionals to understand the importance of seeking new knowledge and skills, in addition to offering organizational support so that it is possible to put into practice what has been learned (AMORIM and SILVA, 2012).

The effectiveness of this training was demonstrated by the positive results of the questionnaire applied immediately after its completion. The acquisition of knowledge and skills previously unknown by the nurses was observed. After the application of the training, it is essential to use strategies to assess whether the acquisition of new knowledge and skills has occurred, since in an unwelcoming environment they generate demotivation and impair learning (BORGES, et al. 2006).

5 CONCLUSION

This study identified some weaknesses in the preventive practices performed by the nurses of the units during the nursing consultation with diabetic patients. The evaluation of foot sensitivity is essential to identify risk factors and reduce the chances of amputation, however, it is not yet a practice incorporated by all nurses, and the specific tests, monofilament and tuning fork, to assess foot sensitivity are unknown to the participants.

Regarding the patients evaluated, most of them are unaware of the situations that can lead to the foot diabetic, such as: use of inappropriate shoes, ineffective hydration, skin alteration and signs indicative of ringworm. It is important to encourage the practice of self-care with the application of simple practices, such as the use of appropriate shoes, nail trimming with the correct technique and proper hygiene.

Nurses play a fundamental role in the screening of patients with DM and in the prevention of diabetic foot. Training is a strategy of Permanent Education in Health, evidencing the need to expand learning spaces in the workplace itself, respecting the knowledge of professionals and making the environment participatory.

REFERENCES

AMORIM, T.N.G.F.; SILVA, L.B. Treinamento no serviço público: Uma abordagem com servidores técnico-administrativos de universidade. TPA, 2(1) – 28, 2012.

BORGES-ANDRADE, J.E.; et al. Treinamento, desenvolvimento e educação em organizações e trabalho: fundamentos para a gestão de pessoas. Porto Alegre: Artmed, 2006.

BRAGANÇA, C.M.; GOMES, I.C.; FONSECA, M.R.C.C.; et al. Avaliação das práticas preventivas do pé diabético. J Health Sci Inst, 28(2):159-63, 2010.

BRASIL. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. Manual do pé diabético: estratégias para o cuidado da pessoa com doença crônica. Brasília: Ministério da Saúde, p 1-62, 2016.

Brasil. Ministério da Saúde. Secretaria de Políticas de Saúde. Departamento de Ações Programáticas Estratégicas. Plano de reorganização da atenção à hipertensão arterial e ao diabetes mellitus: hipertensão arterial e diabetes mellitus. Brasília: MS; 2001.

CISNEROS, L.L.; GONÇALVES, L.A.O.; Educação terapêutica para diabéticos: os cuidados com os pés na realidade de pacientes e familiares. Cien Saude Colet ,16(supl 1):1505-14, 2011.

CUBAS, M. R.; SANTOS, O.M.; RETZIAFF, E.M.A.; et al. Pé diabético: orientações e conhecimento sobre cuidados preventivos. Fisioter. Mov., 26(3): 647-655, 2013.

DIRETRIZES DA SOCIEDADE BRASILEIRA DE DIABETES 2019-2020. Disponível em: https://www.saude.ba.gov.br/wp-content/uploads/2020/02/Diretrizes-Sociedade-Brasileira-de-Diabetes-2019-2020.pdf. Acesso em: 25 maio 2023.

International Working Group on the Diabetic Foot (IWGDF) Guidelines. Diretrizes do IWGDF sobre a prevenção e o tratamento de pé diabético. 2019. Disponível em: https://iwgdfguidelines.org/wp content/uploads/2020/12/Brazilian-Portuguese-translation-IWGDF-Guidelines-2019.pdf.

LIRA, J.A.C.; OLIVEIRA, B.M.A.; SOARES, D.R.; et al. Avaliação do risco de ulceração nos pés em pessoas com diabetes Mellitus na Atenção Primária. REME - Rev Min Enferm, 24:e-1327, 2020. Disponível em: http://www.revenf.bvs.br/pdf/reme/v24/1415-2762-reme-24-e-1327.pdf. DOI: 10.5935/1415-2762.20200064. Acesso em 25 maio 2023.

LUCOVEISI, M.L.S.; GAMBAI, M.A.; PAULA, M.A.B.; MORITA, A.B.P. Degree of risk for foot ulcer due to diabetes: nursing assessment. Rev Bras Enferm [Internet]. 71(6):3041-7, 2018. DOI: http://dx.doi.org/10.1590/0034-7167-2017-0189.

MEDEIROS, M.V.S.; PAIXÃO, I.P.; AGRA, G.; et al. Perfil sociodemográfico, clínico e terapêutico de pacientes com risco para pé diabético. Rev enferm UFPE [periódico na Internet]. 10(6): 2018-28, 2016. Disponível em: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/9700/pdf. Acesso em: 25 maio 2023.

OLIVEIRA, J.C.; TAQUARY, S.A.S.; BARBOSA, A.M.; VERONEZI, R.J.B. Pé diabético e amputações em um hospital público: estudo transversal. ABCS Health Sci; 41 (1):34-39, 2016.

PRZYSIEZNY, A.; RODRIGUES, K.F.; SANTIAGO, L.H.; SILVA, M.CV. Características sociodemográficas de pacientes com diabetes mellitus portadores de pé diabético e ou retinopatia

diabética atendidos em 16 unidades de Estratégia de Saúde da Família de Blumenau. Arq Catarin Med, 42(1):76-84, 2013.

ROLIM, L.; THYSSEN, P.; FLUMIGNAN, R.; et al. Diagnóstico e tratamento da neuropatia periférica diabética. In: Diretriz Oficial da Sociedade Brasileira de Diabetes (2022). DOI: 10.29327/557753.2022-14. Disponível em: https://diretriz.diabetes.org.br/prevencao-diagnostico-e-tratamento-da-neuropatia-periferica-diabetica/. Acesso em: 25 maio 2023.

ROLIM, L.C.; SÁ, J.R.; CHACRA, A.R.; DIB, S,A. Clinical heterogeneity and coexistence of diabetic neuropathies: difference and similarities between types 1 and 2 diabetes mellitus. Arq Bras Endocrinol Metabol, 53(7):818–24, 2009.

SANTOS, I.C.R.V.; BEZERRA, G.C.; SOUZA, C.L.; PEREIRA, L.C. Pé Diabético: apresentação clínica e relação com atendimentos na atenção básica. Rev Rene,12(2):393-400, 2011.

SANTOS, I.C.R.V.; NUNES, E.N.S.; MORAIS, M.C.A.; MELO, C.M.; FARIAS, D.G. Amputações por pé diabético e fatores sociais: implicações para cuidados preventivos de enfermagem. Rev Rene, 12(4):684-91, 2011.

SANTOS, I.C.R.V.; SOBREIRA, C.M.M.; NUNES, E.N.S.; MORAIS, M.C.A. Prevalência e fatores associados a amputações por pé diabético. Cien Saude Colet, 18(10):3007-14, 2013.

SBACV-SP Consenso no Tratamento e Prevenção do Pé Diabético. 1. ed. - Rio de Janeiro: Guanabara Koogan, p 1-76, 2020.

SILVA, M.A.C.; PEREIRA, S.D.; ALMEIDA, C.S.D.; et al. Pé Diabético e Avaliação do Risco de Ulceração. Rev Enf Ref [periódico na Internet], 1:153-61, 2014. Disponível em: file:///C:/Users/Izabel/Downloads/17_Revista_Refer%C3%AAncia_RIII12166T_PORT.pdf. Acesso em: 25 maio 2023

THOMAZELLI, F.C.; MACHADO, C.B.;, DOLÇAN, K.S.; Análise do risco de pé diabético em um ambulatório interdisciplinar de diabetes. Rev AMRIGS, 59 (1): 10-14 2015.

VARGAS, C.P.; LIMA, D.K.S.; SILVA, D.L.; et al. Condutas dos enfermeiros da atenção primária no cuidado a pessoas com pé diabético. Rev enferm UFPE (on line), 11(Supl. 11):4535-45, 2017. Disponível em: https://periodicos.ufpe.br/revistas/revistaenfermagem/article/viewFile/231192/25181. Acesso em: 25 maio 2023.

ZHANG, P.; LU, J.; JING, Y.; et al. Global epidemiology of diabetic foot ulceration: a systematic review and meta-analysis. Annals of Medicine, 49(2):106-116, 2017.

ZÖRRER, L.A.B.F.; GIANINI, V.C.M.; SAFAR, G.M.; SILVA, M.M.C.; et al. Fatores associados à ulceração de indivíduos com DM. Medicina (Ribeirão), 55(1):e-183471, 2022. Disponível em: https://doi.org/10.11606/issn.2176-7262.rmrp.2022.183471. Acesso em: 25 de maio 2023.