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PERFORMANCE AND DIFFICULTIES OF FAMILY NURSES IN THE PREVENTION OF DIABETIC FOOT

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ABSTRACT

Objectives: To investigate the preventive assessment of the foot in patients with diabetes mellitus (DM) performed by nurses from the Family Health Strategy. **Method:** A descriptive-exploratory study, with a qualitative approach, carried out in Basic Health Units in the urban area of Floriano, state of Piauí, Brazil, with ten nurses from the Family Health Strategy. Data were obtained through remote interviews using a semi-structured script. For data analysis, the content analysis technique proposed by Deslandes et al. was used. **Results:** From this, the categories "Nurses' actions in the prevention of diabetic foot" and "Factors that interfere in the preventive assessment of the feet" emerged. The preventive assessment of the feet in diabetic patients is partial, superficial and fragmented. **Conclusion:** It is necessary to train professionals for the development of preventive assessment of the diabetic foot, as well as the provision of necessary resources for this purpose.

DESCRIPTORS: Diabetic Foot. Nursing Care. Primary Health Care.

ATUAÇÃO E DIFICULDADES DE ENFERMEIROS DA ESTRATÉGIA SAÚDE DA FAMÍLIA NA PREVENÇÃO DO PÉ DIABÉTICO

RESUMO

Objetivos: Analisar a avaliação preventiva dos pés em pacientes com diabetes mellitus (DM) realizada por enfermeiros da Estratégia Saúde da Família. **Método:** Estudo descritivo-exploratório, com abordagem qualitativa, realizado nas Unidades Básicas de Saúde da zona urbana de Floriano (PI), com dez enfermeiras da Estratégia Saúde da Família. Os dados foram obtidos por meio de entrevistas remotas utilizando roteiro semiestruturado. Para a análise dos dados, utilizou-se a técnica de análise de conteúdo proposta por Deslandes et al. **Resultados:** Obteve-se o reconhecimento de duas categorias "Ações do enfermeiro na prevenção do pé diabético" e "Fatores que interferem na avaliação preventiva dos pés". A avaliação preventiva dos pés em pacientes diabéticos é parcial, superficial e fragmentada. **Conclusão:** A avaliação preventiva dos pés em pacientes com diabetes é parcial, superficial e fragmentada, pois limita-se a orientações de autocuidado, que, também, são incompletas e até não executadas.

DESCRITORES: Pé Diabético. Cuidados de Enfermagem. Atenção Primária à Saúde.

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ACTUACIÓN Y DIFICULTADES DE LOS ENFERMEROS DE LA FAMILIA EN LA PREVENCIÓN DEL PIE DIABÉTICO

RESUMEN

Objetivos: Investigar la evaluación preventiva del pie en pacientes con diabetes mellitus (DM) realizada por enfermeros de la Estrategia Salud de la Familia. **Método:** Estudio descriptivo-exploratorio, con abordaje cualitativo, realizado en Unidades Básicas de Salud del área urbana de Floriano-PI, con diez enfermeros de la Estrategia Salud de la Familia. Los datos se obtuvieron a través de entrevistas a distancia utilizando un guión semiestructurado. Para el análisis de los datos se utilizó la técnica de Análisis de Contenido propuesta por Deslandes et al. **Resultados:** A partir de eso, surgieron las categorías "Acciones de los enfermeros en la prevención del pie diabético" y "Factores que interfieren en la evaluación preventiva de los pies". La valoración preventiva de los pies en pacientes diabéticos es parcial, superficial y fragmentada. **Conclusión:** Es necesaria la formación de profesionales para el desarrollo de la valoración preventiva del pie diabético, así como la dotación de los recursos necesarios para tal fin.

DESCRIPTORES: Pie Diabético. Atención de Enfermería. Atención Primaria de Salud.

INTRODUCTION

The diabetic foot is one of the most frequent complications in patients with diabetes mellitus (DM) and is configured as the main sequel of the disease, being responsible for most of the causes of nontraumatic amputations of the lower limbs[1].

About 20 to 33% of the costs related to DM are directed to the treatment of the diabetic foot, which, besides compromising the health and quality of life of the patients, also contributes to excess mortality, increasing the physical, psychological and financial burden of the disease on patients and the community[2–4].

In a study conducted in Latin American countries, diabetic foot was the reason for hospitalization for 3.7% of all hospitalized patients[5]. Another investigation pointed out that most people with DM who underwent surgical procedures, severe or not, had such a situation to the prevalence of infectious diabetic foot and/or nonadherence to conservative treatment[6].

In this scenario, diabetic foot prevention is the best strategy to reduce its occurrence. Thus, the nurse stands out as one of the elementary professionals in preventive care, through the nursing consultation in Primary Health Care (PHC) that should involve the evaluation of feet and lesions, the risk classification of the individual and their needs, as well as an assistance based on the guidance to people and their families about the importance of foot care, adoption of a healthy diet and lifestyle and maintenance of appropriate glycemic levels[7].

In this perspective, it is understood that the diabetic foot is a complication of high prevalence and repercussions on the quality of life of people with DM, configured as a world epidemic and a serious public health problem, and the nurse, a professional working in PHC, needs to have sufficient scientific knowledge to deal with patients who need specialized care in the prevention of this situation.

From this assumption, the following guiding question emerged: "How does the nurse perform the preventive assessment of feet in patients with DM in the Family Health Strategy in the municipality of Floriano, Piauí?" and the following objective: to analyze the preventive assessment of feet in patients with DM performed by nurses of the Family Health Strategy.

METHODS

Study with a qualitative, descriptive-exploratory approach, guided by the recommendations of the Consolidated Criteria for Reporting Qualitative Research (COREQ)[8]. It was carried out in the Basic Health Units (BHUs), located in the urban area of the city of Floriano, Piauí, Brazil, with ten nurses from the Family Health Strategy.

Inclusion criteria were: to have at least six months of work in direct assistance to patients with diabetes, as this way the professionals would be able to explain the theme of the study. Those who were away on leave or vacation,

absence or insufficiency of digital technologies, such as internet access, cell phone or computer that did not allow the interview to be conducted, or those who could not participate in the interview, for some reason, after two contact attempts, were excluded.

The data were obtained from July to August 2021, using a semistructured script composed of open and flexible questions. It should be noted that due to the SARS-CoV-2 pandemic scenario, the interviews took place through the digital platform Google Meet. Initially, the Municipal Health Secretariat of the city of Floriano was contacted to request the telephone or e-mail contacts of the BHUs in order to communicate with the nurses.

The triggering questions for the speeches referring to the nurse's performance in the assessment of the diabetic foot were: "How do you perform the preventive assessment of the foot in patients with DM in your care practice in the Family Health Strategy? What health actions do you perform with patients with DM in order to prevent the occurrence of diabetic foot? What difficulties do you encounter in doing a proper preventive foot assessment in patients with DM?"

As for anonymity, the participants were nominated with the letter N (nurse) and the sequential number of the interviews, which were previously scheduled, and, after that, the necessary procedures for the research and voluntary acceptance were clarified, with the signature of the Free and Informed Consent Form, electronically, through the authentication of the participant's e-mail.

The interviews were recorded by the Google Meet application and occurred through dialogue with the participants, which lasted a minimum of 20 minutes and a maximum of 40 minutes, all in a single meeting between the assistant researcher and each interviewee. The information was transcribed in Microsoft Word and later sent via e-mail to the interviewed nurses so that they could validate their speeches. It should be noted that data saturation was reached as no new elements were found and no new information was added.

After this step, we used the content analysis technique proposed by Deslandes et al.[9]. The first step was the preanalysis, where the global reading of the material was performed, providing the opportunity to preorganize the information obtained. The second stage was represented by the exploration of the material in which successive readings of the information and categorization of the speeches were performed. The third and last step of the content analysis comprised the interpretation of the results by relating them to the findings in the literature.

This study was reviewed and approved by the Research Ethics Committee of the State University of Piauí (CEP/UESPI) under opinion No. 4,800,262, of June 23, 2021 and complied with all the ethical precepts set forth in resolutions No. 580/2018[10], No. 510/2016[11], No. 466/2012[12] and the Circular Letter No. 1/2021[13] of the National Health Council, which highlights the ethical aspects of research with human beings and about research in a virtual environment.

RESULTS

Ten nurses were interviewed, and their sociodemographic and professional profiles were characterized. All participants were female, between 28 and 57 years old; most of them self-reported to be brown (six) and married (four), regarding marital status. The time of graduation ranged from 1 to 35 years, and the time of service in the Family Health Strategy ranged from 1 to 15 years.

Regarding the workload, 30 hours a week was predominant (six); all of them worked in only one Family Health Team, and most of them were statutory public servants (six) who reported not having had specific training for the evaluation of the diabetic foot (seven).

Based on the participants' testimonies, it was feasible to build the following categories: "Nurses' actions in the prevention of diabetic foot" and "Factors that interfere in the preventive evaluation of feet."

Nurses' actions in diabetic foot prevention

From the speeches, it was possible to infer that nurses provide guidance on self-care, especially regarding the nail cutting, which should always be straight; use of appropriate footwear, which should be closed and comfortable; use

cotton socks that have no seams inside; do not walk barefoot; about foot hygiene, emphasizing that, when washing them, they should be dried well, especially between the toes; moisturizing the feet, especially in the drier areas and after bathing; self-examination of the feet, observing the color, presence of mycoses, if there is change in sensitivity and temperature, and that it should be performed in a well-lit place to get a better view, according to the speeches below:

> I try to identify [...] what footwear he uses, I guide which is the best types [sic]. I give orientation about moisturizing the foot, about cutting the nails, which must be a square, can't be too round, the question of sanding [...] If the foot is a little rough, I give the orientation of soaking the foot [...], putting oil in these cases like this (N6).

> […] Always cut straight, do not cut the corners of the nail to avoid puncturing the corner of the nail. The guidance I give is with scissors, preferably not sharp ones. The observation of the color of the foot […] (N7).

> Guide the patient to always moisturize the feet to prevent them from drying out, cut the nails, and more preferably use a file, not even scissors. That little straighter cut, not that rounded cut too. Always wear shoes, avoid walking barefoot, wear a shoe that is suitable, wearing socks. If it is a sock, a sock that is made of cotton, a sock that has no seams […]. Avoid removing calluses with foot file […]. Just as the socks don't have seams inside, the ideal is that these shoes don't have seams inside because they can end up hurting the foot […]. That he performs daily self-examination of his feet […], observes if there is any color change […]. As for hygiene, I always tell him that when he takes a shower, he should clean his feet well, especially between the toes, so that we can avoid some kind of fungus between the toes, and that he should always dry his feet well. Only when this foot is very dry can it wear the shoe, in fact […]. Hydrate the feet well, too, before wearing the shoes […] (N10).

Given this, it is feasible that the participants recommended valuable and pertinent guidelines for the patient with DM. However, some were provided incompletely and/or inadequately, according to the following statements:

> I did not ponder on this (areas that should be avoided when moisturizing the feet). […] I didn't pay attention to the areas where he can't apply it […] (N10).

> […] Basically, hydration, I don't make any specifications with regard to location, no, understand? […] I don't specify the way he moisturizes, no. Only that to put it on. Always bathe, sanitize first. And then when he goes to sleep, put it on […] (N9).

Furthermore, one participant stated that she did not conduct orientations, justifying her nonexecution by the great demand for attendance, according to the following speech:

> I don't do orientations. This is a major flaw that I, as a professional, recognize. I can't do it. If there is a colleague who has a lower demand than mine and can manage... In our reality here I can't do it (N5).

It was feasible to apprehend in the speeches of the participants that they evaluate the skin through inspection in the physical exam, checking the characteristics of the skin, such as coloration, presence of calluses and deformities, edemas, dryness; hydration, hygiene; they evaluate the type of shoes the patient wears; they observe if the patient is cutting the nails correctly, and investigate if there are any fungal infections. About the neurological evaluation, some participants exposed that they use the monofilaments to check the sensitivity of their feet, as well as the touch to check their temperature. As for the vascular evaluation, some reported palpating the pulses, adding the measurement of the ankle-brachial index (ABI). The statements below exemplify the nurses' actions:

> In practice, we do a very simple evaluation, it is a quick assessment […]. We evaluate the skin characteristics, hydration, sensitivity, the patient's pain […] and complaints. Sometimes I use an esthesiometer […] (N1).

> I built a material, an evaluation form to conduct the moment of examination […]. It goes from a visual evaluation of the foot to checking the sensitive part with a monofilament that we use […]. (N2).

> […] Start by evaluating the type of shoes he wears […]. After the evaluation, we check his foot itself... We observe the presence of any deformity, mycosis, claw foot. Then after that we evaluate the sensitivity... touch, to see if it's an ischemic foot, if it's a neuropathic foot, if it's a mixed foot, or both... if it's Charcot. […] We take it, feel it, check the pulse, and, if necessary, do an ABI. We evaluated the vascularization […]. You felt the cold foot, do palpation of the pulses, see if it has a pulse (N3).

> I often ask to have a look at the feet of diabetic patients. I see if the nails are too dry, how the cut is, if the nails are inflamed […]. I also always look at the color issue, how is the color of this foot […]. The question of temperature, whether it is too hot or too cold. Check the question of the pulse, if it is a strong pulse or if it is a little pulse that is fading, a weaker pulse. It is also important that we evaluate the patient's foot vascular status. And also the question of sensitivity, how is the patient's sensitivity that we can even check with the monofilaments […] (N10).

Based on this assumption, there were still some reports in which the participants reported not performing the physical examination of the feet, and those that were performed were incomplete:

> Physical examination of the feet is not performed […] (N4).

> […] There is no routine of doing this evaluation, no […] (N9).

Factors that interfere in the preventive evaluation of feet

There are several difficulties that make it impossible for nurses to provide complete and quality care to patients with DM and, consequently, to prevent the appearance of foot ulcers. The participants reported a lack of material resources; training to enable them to perform adequate preventive foot assessment; the absence of a protocol/manual/guide in the municipality; low management initiative; and the focus on patients with DM only when they come to the BHU with complaints. This can be observed in the following speeches:

> We don't follow a protocol, we don't do this in the day-to-day routine. The tuning fork does not exist, this is not Floriano's reality […]. Nobody does. We do not have access to any specific material […]. It is difficult for you to standardize a service […]. We have no protocol for practically nothing. We don't have material resources. Material resources, training, updates are lacking (N1).

> […] I don't perceive a strong management in this sense, on the part of creating protocols […] (N2).

> We have no evaluation. I won't lie. This is not an excuse, this is a real professional failure […]. The chronic diseases, diabetes [...], they fall short, very, very short. We can't handle it. So, the preventive part of the diabetic foot does not exist […]. Then, when the patient already has some symptoms, that's when we, unfortunately, look again […] (N5).

DISCUSSION

Self-care guidelines are key elements for the patient to recognize the importance and positive impact on adherence to recommendations. However, the nurses' speeches show incompleteness in the orientations regarding the hydration of the feet, which was evidenced by the lack of knowledge about the areas that should be avoided in the lower extremities, since the application cannot be performed between the toes, due to the favorable space for the increase of humidity and,

consequently, the risk of fungal infections, which are aggravating conditions. It is also noteworthy the relevance concerning the orientation of feet hydration, since a study shows that 70.7% of people with DM have dry skin and 50% have cracked feet[14].

It was found, based on the testimonies, that there was a lack of transmission about the guidelines, such as: monitor the water temperature (with the water temperature always below 37 °C) during foot hygiene to avoid burns due to reduced thermal sensitivity; socks should not contain seams to prevent excessive friction; inspect the inside of the shoes daily to detect the presence of objects that can hurt the feet with the help of a mirror, even because of the low visual acuity that can hinder self-inspection resulting from complications of DM or other causes; do not remove corns and calluses, because they must be evaluated and treated by the health team; orient about the use of heater or hot water bag to warm the feet; and do not use chemical agents or plasters to remove corns or calluses[16–18].

Furthermore, it was observed that one nurse did not provide orientation to her patients because of the high demand. This demonstrates a worrisome factor regarding diabetic foot prevention, as a systematic review study showed that after self-care orientations, individuals achieved significant improvements in foot self-care behavior[15].

The nurse should pay attention to the high-risk patient, who should wear orthopedic shoes with enough space for the toes to accommodate small deformities, in addition to a wide base for better support and traction, and foam padding for cushioning. Still, it is important to keep in mind the specific needs of each patient, because there is no one-size-fits-all shoe for diabetics and, therefore, the indication of the shoe must be fundamentally correlated to the neurological, circulatory, and musculoskeletal alterations identified. However, the financial conditions of the patient and family must be considered, because not everyone has the resources to buy adapted shoes. That said, the nurse must be creative and strategize in the face of cost limitations[19,20].

The speeches show that the nurses do not have an order to perform the physical examination of the feet, besides limiting its performance to the inspection of the skin, which is an important aspect, but that should be added to other evaluation methods. In accordance with the findings of this research, a study conducted with 20 people diagnosed with DM found that nurses perform the physical examination of the feet, but there is no systematization to guide them for a better structuring of care[7].

The physical examination of the feet is a highly important care to prevent and screen early signs and symptoms of risk for foot ulceration, besides being a thorough examination that aggregates to the anamnesis; thus, it is possible to prove the existence and severity of diabetic neuropathy and peripheral arterial disease21. A study carried out in a Family Health Unit in Recife, with 48 patients diagnosed with DM, pointed out that 83.3% of the users reported not having their feet examined during the consultation[22].

It is known that there are many factors that prevent nurses from providing qualified care. This fact is a reality in other regions of Brazil, such as Fortaleza, Ceará, where nurses from five BHUs pointed out the lack of material resources, equipment, permanent education and even the physical structure as a detrimental factor to the professional performance[23]. In this context, the literature states that nurses, as a fundamental part in the foot care process, should routinely seek professional qualification in order to acquire technical and scientific knowledge that will enable them to meet the health needs of the population and optimize the continuity of care[24].

As for the scarcity of material resources, which is a reality in many BHUs, according to the participants, it makes it unfeasible to perform a complete physical examination of the feet, for example. Some units have the monofilaments to do the neurological evaluation, but it is not the reality of all. It is known, therefore, that for the examination, it is necessary for the nurse to have the Semmes–Weinstein monofilaments, intended for screening peripheral polyneuropathy and neuropathic ulceration risk; the 128 Hz tuning fork, to assess vibratory sensitivity, besides being able to use its handle to test temperature sensitivity to cold; a disposable toothpick, to examine pain sensitivity; the hammer, to assess Achilles tendon reflexes; bioesthesiometer or neuroesthesiometer, to assess the threshold of vibratory sensitivity; and, for vascular assessment, a manual Doppler to measure ABI[17,21].

As for the lack of a protocol/manual/guide that allows the professional to systematize care, it is also a reality perceived in the study by Vargas et al.[25], in which they highlight the inexistence of an assessment tool as detrimental in the investigation of risk factors, treatment, and prevention of diabetic foot. However, they claim that this is not a justification, since the theme is already clearly corroborated in the scientific community.

The evaluation of the feet being performed only upon the presentation of complaints, according to what participant N5 said, is also evidenced in other contexts, and this is the most used criterion for nurses to examine the patient's feet, although national and international institutions emphasize the relevance of its execution to prevent diabetic foot[17,22,25].

The main limitation of the study was the difficulties regarding data collection, as a result of the refusal to participate due to lack of time and too many activities in the Family Health Strategy, especially during the pandemic period, a period that is demanding a lot from nurses; not having seen any patients with DM due to the short time of work; and insufficient knowledge about the preventive assessment of the foot. Despite this, it is believed that a relevant percentage of information was reached, which can be useful and encouraging for the formulation of alternatives to improve the assistance and work processes related to the theme addressed.

CONCLUSION

The preventive assessment of feet in patients with DM is limited to self-care guidelines that are also incomplete and even not carried out. It is understood that providing and teaching patients how to perform self-care is critical in their daily lives and plays a valuable role in preventing ulcerations.

Primary care should be configured as an opportunity to promote health and prevent diseases and illnesses, thus, it is verified the fragility of the care offered to patients with DM for the prevention of diabetic foot, in view of the limited knowledge by professionals, the absence of inputs, as well as the foot assessment that is performed in a partial, superficial, and fragmented way. In this sense, it is necessary to train PHC professionals to develop preventive assessment of the diabetic foot, as well as to provide the necessary resources for this purpose.

AUTHORS' CONTRIBUTION

Conceptualization: Arrais KR and Araujo Filho ACA; **Methodology:** Arrais KR; Araujo Filho ACA and Rodrigues ASA; **Investigation:** Arrais KR; Araujo Filho ACA; Silva AP; Pacheco ES; Silva ÁDM; Rodrigues ASA; Silva MSG; Arrais KR and Bezerra SMG; **Writing – First draft:** Arrais KR; Araujo Filho ACA; Silva AP; Pacheco ES and Silva ÁDM; **Writing – Review & Editing:** Arrais KR and Silva ÁDM; **Resources:** Arrais KR; Araujo Filho ACA; Silva AP; Pacheco ES and Silva ÁDM; **Supervision:** Bezerra SMG.

AVAILABILITY OF RESEARCH DATA

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