

Prevention of diabetic foot: care practices among users of a family health unit

Prevenção do pé diabético: práticas de cuidados de usuários de uma unidade saúde da família

Prevención del pie diabético: prácticas de cuidados de usuarios de una unidad de salud de la familia

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ABSTRACT

Objective: to learn the foot care measures taken by users with Diabetes Mellitus treated at a Family Health Unit. **Method:** for this qualitative, descriptive study, twelve users with a diagnosis of Diabetes Mellitus attending a Family Health Unit in a town in Rio Grande do Sul State (RS) were interviewed. **Results:** the participants were predominantly women, had not completed lower secondary school and had little income. Important care for preventing foot injuries was identified, but was not performed or performed incorrectly by most users. **Conclusion:** users found it difficult to perform foot care correctly and to make the association that basic care is important to prevent foot injury.

Descriptors: Nursing; Primary Health Care; Family Health; Diabetes Mellitus; Diabetic Foot.

RESUMO

Objetivo: conhecer as práticas de cuidados com os pés realizadas por usuários com Diabetes Mellitus atendidos em uma Unidade de Saúde da Família. **Método:** estudo descritivo, com abordagem qualitativa. Foram entrevistados 12 usuários com diagnóstico de Diabetes Mellitus atendidos por uma Unidade Saúde da Família de um município do interior do Estado do Rio Grande do Sul (RS). **Resultados:** dentre os participantes predominaram mulheres, com ensino fundamental incompleto e baixa renda. Identificou-se cuidados importantes para a prevenção de lesão nos pés, que a maioria dos usuários não realizava, ou realizava incorretamente. **Conclusão:** Os usuários têm dificuldade em realizar os cuidados com os pés de forma correta e de associar que cuidados básicos são importantes para a prevenção de lesão nos pés.

Descritores: Enfermagem; Atenção Primária à Saúde; Saúde da Família; Diabetes Mellitus; Pé Diabético.

RESUMEN

Objetivo: conocer las prácticas de cuidados de los pies que realizan los pacientes con Diabetes Mellitus atendidos en una Unidad de Salud de la Familia. **Método:** estudio descriptivo con enfoque cualitativo. Se entrevistaron a doce usuarios diagnosticados de Diabetes Mellitus, atendidos por una Unidad de Salud de la Familia en una ciudad del interior del Estado de Rio Grande do Sul (RS). **Resultados:** entre los participantes predominaron las mujeres, con educación primaria incompleta y bajos ingresos. Se percibió que la mayoría de los usuarios no realizó, o realizó incorrectamente, cuidados importantes para prevenir lesiones en los pies. **Conclusión:** los usuarios tienen dificultades para realizar correctamente los cuidados de los pies y para entender que los cuidados básicos son importantes para la prevención de lesiones en los pies.

Descriptores: Enfermería; Atención Primaria de Salud; Salud de la Familia; Diabetes Mellitus; Pie Diabético.

INTRODUCTION

Chronic Non-Communicable Diseases (CNCDs) represent an important increase in the causes of morbidity and mortality in the world. About 463 million people are diagnosed with Diabetes Mellitus (DM), corresponding to 9.3% of the population aged 20 to 79 years. Of these, it is estimated that 79% live in underdeveloped countries¹.

DM is understood as a chronic condition that occurs when there are high levels of glucose in the blood, caused by the non-production, insufficient production or non-effective use of the hormone insulin produced by the body¹. The classification of DM is divided into four clinical classes: type 1, type 2, gestational DM and other types of DM. Type 1 DM results from the destruction of beta cells leading to absolute insulin deficiency; type 2 DM results from a progressive insulin secretory defect, causing resistance to the hormone's action; gestational DM results from decreased glucose tolerance, diagnosed during pregnancy, and may or may not persist after delivery; and the other types of DM occur due to other causes such as, for example, genetic defects of beta cells and genetic defects in insulin action².

Based on 2019 estimates, the number of people diagnosed with DM in the world is expected to rise to 578 million in 2030 and that in 2045, this number will be 700 million¹. Furthermore, it is assumed that half of people with DM do not know they have the disease, thus increasing the chances of complications, considering that the earlier the diagnosis is made, the better the chances of maintaining quality of life¹.

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In addition to the significant increase in the number of cases each year, DM is responsible for a large number of deaths in the world population. In 2019, approximately 4.2 million people aged 20 to 79 years died from diabetes, accounting for 11.3% of global mortality from all causes in this age group. In the same year, in Brazil, data indicated that the number of people with DM was 11.9 million. Moreover, the country had the highest number of deaths in South and Central America, totaling more than 100,000 cases¹. Populational aging, the growing prevalence of obesity and sedentary lifestyles and urbanization processes can be considered as important factors related to the increase in the number of diabetics³. This context can also generate high social and financial costs for the diagnosed individual and their family, since type 2 DM is associated with complications such as renal failure, lower limb amputation, blindness, cardiovascular diseases, among others, leading consequently to increased use of health services, loss of productivity and disability of users³.

Among the complications that type 2 DM can cause, diabetic foot is one of the most common. This complication may be associated with neuropathy and peripheral arterial disease, which may aggravate foot injuries, causing infection and, if not treated correctly, amputation^{1,4}.

A study carried out in Minas Gerais shows that about 3.1% of patients have foot injuries as one of the complications of DM and that of these, 50% become infected and 20% progress to limb amputation^{5,6}. Furthermore, 80% of non-traumatic lower limb amputations are consequences of DM⁶. It is known that a large number of cases of lower limb amputation in diabetic patients can be avoided. Therefore, carrying out an educational approach with these users, through health education with guidelines for foot ulcer prevention and frequent examination of the feet of the population with DM is of paramount importance².

It is also essential to institute diabetes education at all levels of care so that prevention can take place in a really effective way. Guiding these patients about foot care is an important tool in reducing the risk of ulcer and amputation in the lower limbs.

With effective health actions and guidance on foot care for patients with DM, most injuries and amputations in the lower limbs can be avoided⁷. Furthermore, there is evidence that programs with educational intervention with patients contribute to the acquisition of positive behavior and increase knowledge for self-care, helping to prevent foot injuries⁸.

Therefore, it is essential that the health teams of Primary Health Care (PHC), as they are considered the gateway to the Unified Health System (SUS - *Sistema Único de Saúde*), organize themselves to promote educational care for people affected by DM⁴. It is understood that nursing has an important role in the health education of people with DM on the care needed to prevent the onset of ulcerative lesions⁹.

Nurses need to be one of the main educators in this scenario so that, through periodic examination of users' lower limbs, they can provide guidance, encourage self-care and prevent complications. Therefore, the question that guided this research was: how do users of a Family Health Unit with diabetes mellitus develop care for their feet? The objective was to identify the foot care practices performed by users with diabetes mellitus treated at a Family Health Unit.

METHOD

This was a descriptive study with a qualitative approach. The research was carried out in a Family Health Unit (FHU) in a city in the countryside of the state of Rio Grande do Sul (RS). The population studied were patients with DM treated at the FHU. It is noteworthy that the register of people enrolled in this FHU was not complete at the time of the research, thus the total number of people with DM belonging to the FHU was not known. Adult users diagnosed with DM treated by the unit's health team were included. Users who, after three attempts to contact, it was not possible to make contact were excluded. Collection was completed when enough information was obtained to complete the research, that is, when the pre-defined objectives were achieved/answered. There were 12 interviews carried out, all conducted by the main researcher, who was working at the FHU as a last-year undergraduate nursing student.

The location of data collection was defined according to the health unit's demands. Some users were invited to participate in medical consultation days, some by scheduling a home visit or by actively searching the homes. The data was collected between March and April of 2010.

Data were produced through semi-structured interviews, which were recorded and later transcribed. It was divided into three stages: the first with the characterization of those surveyed based on the history of injury and foot care; in the second, open-ended questions were asked about what care they thought was important for foot injury prevention and what care was provided; and the third, in which foot physical examination and risk stratification and classification for developing foot injuries were performed.

Risk stratification for the development of foot injuries was performed by thorough foot physical examination. An instrument was designed, divided into four stages, to guide the performance of physical examination: skin assessment, musculoskeletal assessment, vascular assessment and neurological assessment and risk classification for foot complications were performed according to the Primary Care Booklet 36 of the Ministry of Health ¹⁰. When, during this stage, injuries to users' feet or risk for development were identified, they were referred to the health unit, in accordance with prior agreement with the team.

It is noteworthy that after the interview and physical examination, guidance was given on foot care according to the need identified in each of the users to prevent complications. Among these guidelines, nail trimming, correct use of moisturizer, foot hygiene and use of appropriate socks and shoes are mentioned.

Data were transcribed and the analysis was performed using Content Analysis, proposed by Laurence Bardin, containing the following steps: pre-analysis, which consists of the initial material organization, and formulation of hypotheses and objectives; material exploration; and treatment of results and interpretations¹¹. During the data analysis and organization phase, NVivo was used. Material exploration, in which encodings are carried out based on previously elaborated rules, and treatment, inference and interpretation of results, aims at making the obtained results significant.

Ethical principles were respected at all stages of the research and the project was approved by the Institutional Review Board of the involved institution on January 23, 2019.

RESULTS

Characterization, foot injury/care history and physical examination

Among the 12 interviews, ten were women and two men. The time since diagnosis of type 2 DM ranged from one to more than ten years. Participants' education level was predominantly incomplete elementary school, and the income was up to one minimum wage (R\$998.00 - about US\$172.00).

Regarding injury and foot care history, the following data were identified, presented in Table 1.

TABLE 1: Foot care and injury history. Saint Maria, RS, Brazil, 2019.

History		n
Injury history	Previous amputation	0
	Foot injury	1
	Calluses	4
	Crack	2
	Applied moisturizer on feet	5
	Dried between toes after showering	11
	Did not walk barefoot	11
	Wore closed and soft shoes	1
	Let feet soak in water	5
	Foot Care	Wore open shoes
Wore socks when wearing closed shoes		12
Wore thread socks		8
Wore elastic socks		10

It is noticed that, even without amputations, most users had signs of risk for developing diabetic foot. Moreover, it is noted that there are controversies in some care, for example, most users (n=11) considered it to be a care not to walk barefoot, but at the same time, the same number of participants used open shoes, instead closed and soft shoes. Also, even though all of them reported using socks when wearing closed shoes, most of them used socks with seams and elastic, which should be avoided to prevent foot injuries.

It is noteworthy that the indication for the use of white socks was not known to any of the participants, the majority reported the use of colored socks. Only two users had mobility limitations.

Physical examination was performed based on four steps: skin assessment, musculoskeletal assessment, vascular assessment and neurological assessment. The data obtained are shown in Table 2.

TABLE 2: Physical examination performed. Saint Maria, RS, Brazil, 2019.

Physical examination		n
Skin assessment	Incorrect nail trimming	6
	Dry skin	12
	Nail alteration	10
Musculoskeletal assessment	Claw fingers	1
	Bunion	1
Vascular assessment	Pediatric and tibial pulse present	12
Neurological assessment	Negative sensitivity somewhere in the regions examined	5

It is noticed that half of users did not correctly trim their nails. All participants have dry skin, which can be explained by the fact that they mentioned that they soaked their feet (n=5), which impairs moisturizing, even when using moisturizer (n=5). Ten of the 12 had alterations in their nails, which could be due to the use of open and/or tight shoes or illnesses.

Regarding the musculoskeletal assessment, deformities in the feet of two users were identified, one with claw toes and the other with a bunion. Finally, in the neurological assessment performed with pain sensitivity tests on the dorsum and sole of the foot, five of the 12 users had negative sensitivity in the regions examined.

With these data, it was possible to carry out the risk stratification for developing foot injuries, from grade 0 to grade 3, with grade 0 being the absence of neuropathy, grade 1 = presence of neuropathy with or without deformities (hammer toes, toes in claw, Charcot, forefoot prominences), grade 2 = presence of peripheral arterial disease with or without neuropathy present and grade 3 = ulcer and/or amputation history⁴. Of the 12 users, three had grade 0 for lesion development, six had grade 1, one had grade 2 and two users had grade 3.

Users' perceptions of foot care practices

When performing the open-ended questions, participants revealed, in addition to the care already indicated in the foot care history, that they were careful to observe the path taken to avoid falls and injuries, that they did not share nail pliers, they performed inspection of the feet, looking for by injuries and sought to take care of their diet, avoiding foods considered unhealthy. In other words, the interviewees' perception is that the care that prevents the onset of foot injuries is broader, not just focusing on foot care, but on the whole body.

When asked about the fact that they had already been oriented by a health professional about the care that should be carried out with the feet, it was possible to notice that very little is said about diabetic foot prevention, especially by nurses. Of all the interviewees, only four users reported having ever received this type of guidance, and of these, three were from doctors and one from a nursing technician.

A contradiction was identified in the statements of those surveyed. When asked about the care performed with the feet, most users report not knowing if they do it, or only report that they take care of their feet. However, when asked to mention how they take care of their feet, many were unable to identify the care they perform. Comparing previously reported participants' responses about foot care, most users were confused when identifying some of the care. This perception leads us to believe that users have difficulties in relating simple everyday practices with care for foot injury prevention, demonstrating that health professionals need to provide guidance, but also adapt the form and language to achieve understanding of users.

Another contradiction present in the results was how they felt about the support received by health professionals. Most reported feeling well treated or oriented, however, when asked if they had already received guidance on diabetic foot prevention at some point, only 1/3 of participants reported that they had. This information, therefore, demonstrates that participants often consider it to be good support, to be welcomed, and not necessarily to receive information relevant to their health needs.

DISCUSSION

There was a greater participation of women in the research. Current studies show that there are more diagnoses in females with DM. In research that identified the prevalence of self-reported DM in Brazil in 2019, the most frequent report was women (BRASIL, 2020), supporting a study carried out in a Basic Health Unit (BHU) in Pernambuco (PE), where there was greater female participation¹³.

Most study participants had low education. According to a study with data from the Brazilian National Survey of Social Dimensions of Inequalities (PDSD - *Pesquisa Dimensões Sociais das Desigualdades*), there is a prevalence of DM

among illiterate or low-educated individuals, up to twice as high as among people with higher education¹⁴, and this may be a factor that makes it difficult to understand the disease it presents.

When initially asked about the care history of their feet, half of interviewees had rounded nails, almost half reported moisturizing their feet, only one reported not drying between the toes and having the habit of walking barefoot, and most respondents wore inappropriate shoes. These data are consistent with a study carried out in Ceará, with patients attending the Integrated Center for Diabetes and Hypertension (CIDH), in which it was possible to identify that more than half of interviewees had rounded nails, dried their feet after bathing and moisturized their feet, few had the habit of walking barefoot, and more than half of users wore open shoes¹⁵.

Regarding the use of socks, all reported using them when wearing closed shoes, however, most wore colored socks, with elastic and stitched. This data corroborates those found in a study carried out with users with DM in Paraná, in which the majority of users wore socks, the majority being colored and sewn¹⁶. However, it contrasts with another study, where it was pointed out that less than half of users wore socks¹⁵.

Regarding foot hygiene, when inspected, only one was inadequate, unlike a survey carried out in Paraná, where almost all users had adequate foot hygiene¹⁶. The same is brought up in a study that registered that only 5% of users surveyed had unsatisfactory hygiene¹⁷.

When asked about using foot moisturizer, nearly half of users reported doing so. This data is in line with the study previously mentioned¹⁵, in which almost half of users surveyed reported moisturizing their feet. However, when inspected again, it was possible to see that all users had dry skin. In a study carried out in a Specialties Clinic of the City of São Paulo, it was also possible to notice that most users had dry skin¹⁸.

It was possible to identify the absence of some important precautions for foot injury prevention, which most users did not perform, or performed incorrectly, and which should receive greater attention at the time of the guidelines. Among them, the fact that they do not trim their nails correctly and walk with inappropriate shoes stands out. When verifying other studies on important care for diabetic foot prevention, it is possible to identify the same^{9,16-19}.

Previous studies have shown that respondents did not wear the proper shoes¹⁶⁻¹⁸. A survey conducted in Maringá (PR) showed that most users did not know which shoes were suitable for people with DM¹⁹. Regarding nail trimming, in addition to not trimming correctly, the literature shows that more than half of users do not have information on how to trim correctly⁹.

Identifying that these were the most problematic care, as they were not performed or were performed inappropriately, a study developed with users with type 2 DM in a BHU located in Paraná, concluded that two of the most prevalent risk factors for development of foot injuries were the presence of dry skin and the use of inappropriate shoes²⁰.

Regarding the risk stratification for the development of foot injuries, in the previous study, in which the classification was also carried out, based on the Diabetic Foot Risk Stratification System, in which the grade of risk is also classified from 0 to 3. Most users had grade 0 (without neuropathy) to develop any lesion, followed by grade 1 (with neuropathy), grade 3 (previous amputation/ulcer) and grade 2 (with neuropathy and signs of peripheral vascular disease and/ or deformities), a situation different from that observed in the present study, in which the majority presented grade 1 for the development of lesions, followed by grade 0, grade 3 and grade 2, demonstrating a low risk¹⁵.

It was identified in this study that users do not understand (or seize) the guidelines received by professionals and have difficulty identifying some simple, daily care capable of preventing diabetic foot as being important for this prevention. Research carried out on the knowledge of foot care among people with type 2 DM shows that at least half of users have inadequate knowledge on the subject¹⁵.

Literature reports that users have a low level of knowledge about foot care, and yet, when they perform some important practices, they are conducted incorrectly, or incompletely⁹. The same is observed in a survey carried out at PHC in Fortaleza/Ceará, in which users claim that the guidelines are important, but they demonstrate a deficit of knowledge and self-care about several of the care needed to prevent injuries²¹.

Therefore, in order to minimize future complications resulting from non-self-care or ineffective self-care, it is necessary that knowledge and practice are interconnected, which would be achieved by improving the knowledge of people with DM^{9,21}. For this, it is essential that professionals provide correct, accessible guidelines and ensure that users understand them.

This data corroborates the identification that only three of the 12 study participants had received guidance on foot care, and none of these by nurses. Scientific data show that users claim never to have received guidance from nurses about the need to perform the foot exam²². The same was found in a survey carried out at a Specialty Clinic in São Paulo, in which more than half of users had never received guidance on foot care from any professional¹⁸.

Based on this, it is stated that much must be done so that foot care and diabetic foot prevention can happen effectively. When asked to nurses, they claim to provide guidance on some of the necessary foot care. However, when interviewing users with DM, they demonstrate that they perform this care inadequately¹⁶.

With this, it is possible to identify that nurses' behavior on this subject is partial and fragmented, and that health professionals end up focusing more on guidelines such as glycemic control, general guidelines on hygiene care, nail trimming, appropriate shoes, or even about the treatment of already installed lesions, not worrying about complication prevention²³. However, professionals need to know the reality of the user who is receiving this information so that the guidance is carried out in a way to be understood and incorporated into their daily lives⁹.

Study limitations

The current study had some limitations. One of them was the difficulty in capturing users, as when invited to the health unit, many were in a hurry or refused to participate. It can be questioned whether the fact of examining the feet is an embarrassment factor, as, according to the results, it is not a recurrent practice in the health service.

FINAL CONSIDERATIONS

This study showed that users have difficulty in performing foot care correctly and in associating that basic care is important for foot injury prevention. Furthermore, health professionals do not address the issue or when they provide guidance, it is superficial, not guaranteeing users' understanding. Professionals need to know their population so that they carry out the guidelines in a way that they understand.

It is important that professionals incorporate in their daily practice guidelines on diabetic foot and foot examination. Nurses, in particular, can play a fundamental role in providing effective care to people with DM. It has the possibility of carrying out educational actions with users and nursing consultations for people with DM, remembering to ensure that the understanding of guidelines is appropriate for the profile of users assisted.

For this, activities aimed at health professionals, especially nurses, are important, such as continuing education in health, in order to keep professionals always updated and sensitized, making it possible to articulate theoretical knowledge with daily practice. In addition to this, it is important to think about multidisciplinary actions in health units so that comprehensive care for users can be achieved.

It is hoped that the study can contribute to the health service, and that it allows users to start receiving guidance and attention aligned with their needs. Also, it is recognized the importance of conducting other studies, which seek to implement educational actions, raising awareness and providing greater knowledge about diabetic foot prevention among users with DM.

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