Tecnologia social para a prevenção de úlceras em pés de pessoas diabéticas

Social technology for the prevention of foot ulcers in diabetic people

Tecnología social para la prevención de úlceras del pie en personas diabéticas

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RESUMO

Objetivo: Descrever a construção de tecnologia social para prevenção de úlceras em pés de pessoas diabéticas. **Método:** Estudo de abordagem qualitativa, caráter descritivo-exploratório, corresponde a uma pesquisa ação que foi realizada com 11 enfermeiras integrantes da Rede de Atenção Primária à Saúde do Município de Salvador, Bahia, Brasil. Esta pesquisa foi norteada pela perspectiva Crítico-Libertadora de Paulo Freire. **Resultados:** A construção da tecnologia social para prevenção de úlceras em pés de pessoas diabéticas se deu com a participação de enfermeiras atuantes na APS, as quais coletivamente propuseram os elementos necessários para compor a planilha online de rastreio no Google Drive. Tais elementos abarcam as necessidades de identificação do paciente, conhecimento da história clínica, acompanhamento da diabetes e suas possíveis complicações, itens para o rastreio, além de determinar encaminhamentos. **Considerações finais:** A tecnologia social se constitui como facilmente replicável, de baixo custo e com relevância social. Sua utilização alcança não apenas enfermeiras, mas abrange outros profissionais de saúde, assim como tem impacto direto na qualidade de vida de pessoas com diabetes.

Descritores: Diabetes Mellitus; Úlcera do Pé; Pessoal da Saúde; Tecnologia de Baixo Custo; Atenção Primária à Saúde.

ABSTRACT

Objective: To describe the construction of social technology for the prevention of foot ulcers in diabetic people. **Method**: Study with a qualitative approach, with a descriptive-exploratory character, corresponding to action research that was carried out with 11 nurses who are members of the Primary Health Care Network in the city of Salvador, Bahia, Brazil. This research was guided by Paulo Freire's Critical-Liberating perspective. **Results:** The construction of social technology for the prevention of foot ulcers in diabetic people took place with the participation of nurses working in the PHC, who collectively presented the necessary elements to compose the online tracking worksheet on Google Drive. Such elements include the needs for patient identification, knowledge of the clinical history, monitoring of diabetes and its possible complications, items for tracking, in addition to determining the referral. **Final considerations**: Social technology is easily replicable, low cost and socially popular. Its use reaches not only nurses, but also other health professionals, as well as having a direct impact on the quality of life of people with diabetes.

Descriptors: Diabetes Mellitus; Foot Ulcer; Health Staff; Low-Cost Technology; Primary Health Care.

RESUMEN

Objetivo: Describir la construcción de tecnología social para prevenir úlceras en los pies en personas diabéticas. **Método:** Estudio con enfoque cualitativo, de carácter descriptivo-exploratorio, correspondiente a una investigación-acción que se realizó con 11 enfermeros integrantes de la Red de Atención Primaria de Salud del Municipio de Salvador, Bahía, Brasil. Esta investigación estuvo guiada por la perspectiva Crítico-Liberador de Paulo Freire. **Resultados:** La construcción de tecnología social para prevenir úlceras del pie en personas diabéticas se realizó con la participación de enfermeros que trabajan en la APS, quienes colectivamente propusieron los elementos necesarios para la composición de la hoja de seguimiento en línea en Google Drive. Estos elementos cubren las necesidades de identificación del paciente, conocimiento de la historia clínica, seguimiento de la diabetes y sus posibles complicaciones, elementos de tamizaje, además de determinar derivaciones. **Consideraciones finales:** La tecnología social es fácilmente replicable, de bajo costo y socialmente relevante. Su uso llega no sólo al personal de enfermería, sino también a otros profesionales de la salud, además de tener un impacto directo en la calidad de vida de las personas con diabetes.

Descriptores: Diabetes Mellitus; Úlcera del pie; Personal de Salud; Tecnología de Bajo Costo; Primeros auxilios.

ORIGINAL

Introduction

Diabetic foot ulcer is characterized by the deep destruction of tissues caused by decreased blood flow in the extremities, and is considered a serious complication of tissue fragility associated with non-control of diabetes.1 This reality, in addition to increasing morbidity and mortality rates and consequent occupancy of hospital beds, compromises people's quality of life.[2]

Foot ulcers in diabetic people are the most common complication of diabetes mellitus (DM) and are directly associated with a high risk of diabetic foot and amputation. As a serious public health problem, DM is a worldwide problem. In 2010, the International Diabetes Federation estimated that by 2025 there would be about 438 million people with this disease in the world, however, in 2020 it is already estimated that 25 million more than expected. The data is even more alarming if we consider that the estimates for 2030 and 2045 are 578 million and 700 million, respectively.[3]

Brazil, in 2019, had more than 16 million people with diabetes, which places it in fifth place in the world ranking, behind China, India, the United States of America and Pakistan.[4] Although diabetes occurs worldwide, the projection of 170% for developing countries, where the disease tends to appear in earlier stages of life, is worrying. unlike in developed countries where the disease develops after the age of 65.[5] These data show that the evolution of this disease, especially in developing countries, can accompany people's lives for a long time and cause complications.

Several factors are associated with the increase in cases of diabetes and contribute to a series of repercussions on people's lives. Factors such as the aging of the population, obesity, urbanization, sedentary lifestyle, inadequate diet, which can be attributed to the speed required in modern times, have contributed to the occurrence of diabetes.[3] In the face of the disease and prolonged coexistence with high glycemic levels, there are greater chances of developing complications, such as retinopathy, nephropathy, cardiovascular diseases and neuropathies.[2] These complications are chronic and imply the quality of life of people with diabetes. World indices, in turn, have shown that diabetes can have consequences in several areas and it should be noted that some of these can trigger other diseases.

Among the complications of diabetes, peripheral neuropathy is one of the most common and responsible for diabetic foot, a situation in which there is a loss of sensitivity, which can contribute to the formation of ulcers, associated with the difficulty of healing after the damage occurs.[6] Still on the diabetic foot, the International Working Group on the Diabetic Foot defines it as an infection, ulceration and/or destruction of soft tissues associated with neurological alterations and various degrees of Peripheral Arterial Disease (PAD) in the lower limbs.[7] These alterations, without due care, can worsen and culminate in limb amputation. Among a population of 7 million Brazilian diabetics, it is estimated that more than 400,000 have developed foot ulcers, which impacts more than 160,000 hospital admissions and more than half of these resulting in amputations.[2]

Worldwide, the cost of diabetic foot ulcers burdens the public coffers, and the International Diabetes Federation estimates that in the United States, 28

thousand dollars are spent on admissions involving ulcers.[8] These indices reveal an international panorama in which it is estimated that one third of individuals living with diabetes develop foot ulcers and national which points to about 9.2 million people with diabetic ulcers.[9-10]

Living with a standing ulcer has implications for people's body vision, which can cause distortion of their self-image or even, due to aggravations, culminate in amputation.[11] In addition, the involvement of a standing ulcer can lead to repeated visits to the Family Health Unit (FHU) for dressing, which can be even more painful when the treatment is not resolute. There is no humanization in the service or there is a lack of resources.[12]

Given the possibility of worsening the disease and the various impacts, preventive actions are necessary for diabetic people. Primary health care (PHC) emerges as a privileged setting for preventive mobilization. This is due to the fact that it is the gateway to the health system, PHC is able to favor the development of strategic actions focused on the needs of its public, such as people with diabetes and the prevention of foot ulcers.[13] In this context, nursing is in a privileged position to ensure welcoming, due to its character focused on the comprehensiveness of care.[14] Supporting this model, the nurses' attributions indicated by the National Primary Care Policy indicate individual and collective actions, aimed not only at the rehabilitation of diseases, but also at health promotion and disease prevention.[15]

It is believed that the construction of a social technology for tracking the risk of foot ulcers in diabetic people in the context of PHC, with the active participation of nurses who care for diabetics in a district health unit, could contribute to the development of ulcer prevention. It is also expected that the academic field will contribute to the development of theoretical knowledge in the prevention of foot ulcers through the systematic follow-up of these high-risk diabetic patients, especially those who abandoned treatment due to the Covid-19 pandemic.

Considering that social technology is a method that aims to solve social problems and improve the quality of life of individuals and collectives, the tool should be easy to apply, inexpensive, and co-created by those interested in its methods.16 Therefore, it is intended that this tool created be put into practice and disseminated in various PHC spaces to prevent ulcers and strengthen the SUS in patients with DM.

Considering this context, in order to direct preventive actions, it is necessary to provide instrumental subsidies that direct them to adopt care focused on prevention. Thus, aiming at the elaboration of a material that reaches PHC and professionals working at this level of care, this study aims to describe the construction of social technology for the prevention of foot ulcers in diabetic people.

Method

This is a descriptive and exploratory study with a qualitative approach, which met the criteria for consolidating the Consolidated Criteria for Reporting Qualitative Research (COREQ) of the action research type, which has a participatory character and is organized in four stages: diagnosis, action planning, execution of actions and evaluation.[17-18] The exploratory and

descriptive study is used when there is an interest in outlining a certain phenomenon, providing a greater approximation and making it more explicit.

Given the originality of social technology, it is appropriate to the object of research, as it is appropriate for the investigation of a new area or subject, in search of expanding the knowledge of this phenomenon. In addition, the research was guided by Paulo Freire's Critical-Liberating perspective, which guides a dialogical and problematizing educational process that together gives autonomy to people, providing reflection on their practice.[19]

In addition, following the premises of action research and the Paulo Freire method, the construction of social technology was developed collectively through thematic intervention workshops. The workshops are procedures that, in addition to ensuring the production of data for the study in a group way, seek to exchange previous knowledge among the participants. In this research, this practice built knowledge not only for the researcher, but for all participants. In this way, it assumes a political and transformative character, insofar as it constitutes a place of formation.[20] Social technology is understood as actions or materials that, together with the participants, are capable of intervening in a given reality, a condition that must obey a participatory methodology and that results in a replicable and socially relevant product.

The study was carried out with 11 nurses linked to Primary Health Care in the city of Salvador, Bahia, Brazil, belonging to one of the 12 health districts of the capital, and the sample was composed of convenience. The inclusion criteria were to work with diabetic patients for at least six months, and those who, due to vacations or leaves of any kind, were away from work activities were excluded.

The primary objectives of action research are: to identify problems, to generate knowledge about the situation raised; and determine strategies for eliminating/minimizing the detected problems. This method is divided into four phases: diagnosis, action planning, action execution, and evaluation.[17]

Following the precepts of action research, the first phase consists of diagnosing the reality to be researched through the knowledge of the locus of study, the survey of the situation and the identification or definition of the main problems. This stage took place through individual interviews in April 2022, guided by a semi-structured questionnaire containing objective and subjective questions about knowledge about the prevention of foot at risk in diabetic people and about the experiences of nurses with diabetic patients. The employees were informed about the objectives, risks and benefits. After agreeing to participate in the study, they signed a free and informed consent form, and the research followed resolution 466/2012 of the National Health Council and was approved by the Research Ethics Committee. The principles of bioethics were considered: autonomy, non-maleficence, beneficence and justice. After clarification about the objective and relevance of the study, the aspects related to non-maleficence were informed. Anonymity was also assured.

From this stage, it was identified that the nurses had knowledge focused on ulcers, understanding their risks, and that the practice was mostly curative, with difficulties in carrying out preventive actions. Later, the second stage of planning the actions began, which contributed to the solution/equation of the problems detected in the diagnosis, as well as the objectives of these actions, the means necessary to achieve them and the subjects who carried them out, in which

the participants were invited to a face-to-face meeting in order to collectively build the technology. In this meeting, the situational diagnosis was presented, it was defined that the other meetings would take place in the morning and afternoon, in order to impact on fewer days absent from work. In addition, the dates and themes were outlined, establishing four meetings: Meeting 1 - Discussion on the diabetic foot; Meeting 2 – Survey of forms of prevention of foot ulcers in diabetic people and Organization of professional attributions in the management of technology; Meeting 3 - Creation of technology to screen the risk of ulcers and draw to create the name of the technology; Meeting 4 - Design of referrals for diabetic people at risk of foot ulcers and elaboration of tutorials for procedures.

The third stage of the execution of the actions took place with the implementation of thematic workshops for collective construction, which took place in the auditorium of a USF, mediated by the researcher, master's student and immersed in the theme. It is noteworthy that, in addition to the theoretical debate, the meetings had the purpose of raising ideas to culminate in the creation of the technology. The fourth stage of evaluation, in the immediate form, occurred through a dynamic called "How good, what a pity and how much" which aims to apprehend the positive, negative and improvement points, having been applied through an online form. The nurses positively rated the interaction and sharing of knowledge, among the few that signaled negative aspects, these were related to the evaluation taking place remotely and suggested a lunch during the meetings and the invitation of other professionals with expertise in the area. Regarding the mediate evaluation that analyzes the effective use of technology by the participants, this will still be carried out.

The data analysis aimed at the comprehensive evaluation of the process, as well as the results achieved, with a focus on the situational diagnosis. In this last phase, we also identified the findings that guide the screening of foot at risk in diabetic people in a comprehensive way. The data were systematized concomitantly with their capture, interpreted and later analyzed in the light of legal provisions, scientific evidence and public policies regarding the care of diabetic people.

Results

In the first meeting, rules of coexistence were agreed: turn off or keep cell phones in silent mode; avoid delays and side conversations; respect for opinions and expressions; ensure the privacy and confidentiality of personal accounts. In addition, the concept of the diabetic foot was discussed through a dynamic with signs containing "yes" and "no" to respond to the statements presented. The mediator presented the following sentences: Every person with a diabetic foot has a wound on the limb (3 yes and 8 no); Every person with diabetic foot has loss of protective sensation of the limb (11 yes and 0 no); Peripheral Neuropathy (PN) affects the hands and feet (11 yes and 0 no); Every person with diabetic foot has Peripheral Artery Disease (PAD) (10 yes and 1 no). After that, the discussion was encouraged, asking each nurse to justify their answer.

The second meeting began by reviewing the last meeting and explained the physiology of ulcers, the concepts of neuropathy and its subtypes. Subsequently, the IWGDF Risk Stratification System, a guideline that provides elements to be

considered in the risk assessment for foot ulcers, was delivered and the group was asked to think about ways of prevention through a dynamic. In this study, the collaborators were led to write, based on their knowledge, pillars of ulcer prevention and, subsequently, the "Top 5 of prevention" was asked to vote, with the following criteria: adequate footwear, support network, adequate professional follow-up, self-care and health education, promoting comparison with the guideline offered.

In the third meeting, the participants collectively decided to address the constituent elements of the technology, which, by voting, adopted the use of an online spreadsheet with simultaneous access, in order to allow the insertion of patient data by different professionals. The spreadsheet built with the elements that compose it can be accessed in https://osf.io/5xkfd/?view_only=150a0f48c075420baabb37912deea62a.

In the fourth meeting, the flows of care were improved and related to each degree of risk. It was defined that all people with diabetes should receive health education, through encouragement of self-care with the feet, nutritional guidance, adherence to drug therapy and glycemic control.

From level 1 of risk, referral to the Center for the Prevention and Rehabilitation of Disabilities is inserted, which, in Bahia, performs rehabilitation actions and has special attention in guidance on the use of shoes for diabetic people, including, if necessary, dispensing prostheses for amputees. In addition to evaluating referral criteria to the Alayde Costa Hospital, a reference in care for people with kidney diseases, the unit is located in the district's own territory.

Those who are stratified as grade 2 and 3 risk for foot ulcers should be referred for evaluation by a vascular surgery specialist and angiologist, with grade 2 being monitored quarterly and grade 3 every 1 to 2 months. Appointments must be scheduled through the Municipal Health Department System. Referral to the Diabetes and Endocrinology Center of Bahia, which is a SUS State Referral Unit, should also be considered.

Discussion

In order to build social technology to help prevent diabetic foot ulcers, thematic workshops were held. In the meantime, to discuss the concept of diabetic foot, which proved to be necessary based on the results in the diagnostic phase and was reaffirmed in the initial dynamics proposed in workshop 1. Corroborating this need for greater knowledge about the conceptualization of the condition, a study carried out in the Brazilian city of Campina Grande with 105 PHC nurses revealed that 51.9% of them were not able to define the diabetic foot correctly, but, on the other hand, 88.7% knew about the prevention of ulcerations.21 This situation reveals how closely linked it is, From the nurses' perspective, diabetic foot and the presence of ulcers.

This problem may be related to nursing practice focused on dressings, which probably leads to this associative tendency. A study reveals that there is a process of mechanization of nursing care, in which the professional acts by reproducing activities without performing clinical reasoning, which can culminate in errors in care and in the trivialization of the disease, and critical thinking is essential to break this process.22 Considering this, with regard to knowledge about the diabetic foot, It is necessary to invest in continuing

education based on the development of the potential and autonomy of professionals, in order to foster responsibility and thus improve the quality of care.[19]

In the second meeting, the participants signaled the need for access to knowledge during their practices. Nurses in a study in Malaysia point out that, during care, they seek information from colleagues because they are a quick source of updates, however, it is highlighted that the low level of knowledge of these professionals can have repercussions on ineffective or mistaken care.[23] In Ethiopia, a study showed that nurses who accessed the internet to answer questions were 44.8% less likely to have good levels of knowledge than those who did not use the internet.[24] In this sense, There is a need to consult materials during consultations and the importance of these contents being reliable and easy to handle.

That said, the participants themselves collectively constructed an instrument that would help them screen for ulcers. According to the precepts of social technology and based on Paulo Freire, the educational process should be built through dialogue and this should allow the emancipation of individuals.[19] Thus, the determination of the elements that should be contained in the instrument to be elaborated was collectively thought by the participants.

The first element raised was personal data in order to know the monitored population. In Malawi, an article that evaluated the impacts of the impoverishment of the population brings the importance of planning specific programs that allow access to health services, and it is therefore necessary to know the needs and formulate policies that are directed.[25] Information about the individuals assisted is part of health planning, in which the identification of needs can help nurses to direct more assertive care actions.

Knowing the specific needs of a population involves the identification of the clinical situation and, therefore, the importance of covering the patient's clinical history was listed by the participants. This is closely related to the identification of risk factors for the development of standing ulcers, which, when known, can help in prevention. A meta-analysis study revealed that being a smoker, having been diagnosed with diabetes for a long time, having PAD, Peripheral Neuropathy and history of previous ulcers are risk factors that predict diabetic foot ulcers.[26] Considering the above, based on the knowledge of these factors, it is possible to recognize the vulnerabilities of individuals assisted by the FHU and offer a viable and timely treatment.

In addition, the collaborators identified the need to also list some tests to monitor the clinical picture of diabetes. When decompensated, it causes a series of systemic complications for the patient, which indicates the need to monitor its dysregulation.[27] Regarding the relationship between changes in diabetes and involvement by foot ulcers, a study conducted in Brasília, Brazil, with 34 patients from a center specialized in the care of diabetic feet revealed that 78.8% of those treated with standing ulcers had high levels of glycated hemoglobin (>7%).[28] Therefore, Understanding the general state of diabetes of the patient followed allows for better assessment of the same and follow-up in an effective treatment to cope with risks.

These risks should be determined early in order to prevent the development of ulcers, and specific tests that have high reliability can be used. An international study that discusses tests for dermatologists to manage ulcers

in the lower limbs point out that the main ones are: ABI, ultrasonography and angiography as essential in the prevention, diagnosis and treatment of vascular diseases.[29] Another study that evaluated the reliability of the ABI found 76.7% to 93.1% accuracy in identifying stenosis in patients with type II diabetes, including recommending its use in clinical practice.[30] Knowing and adopting such tests enhances care because it ensures that care is being offered based on scientific evidence validated for use and with proven efficacy. Despite the efficacy and benefits of such tests, it is necessary for professionals to know them, master how to apply them and use them in their daily practice. Regarding this aspect, a study carried out in Piauí with 2,015 patients with diabetes, followed up at a PHC health unit, showed that 86.3% of them had never undergone foot evaluation tests.[31]

It should be considered that the use of ABI may be optional due to the unavailability of doopler in the units, which does not dispense with the clinical and critical evaluation of the nurse and the team. Thus, the nurses pointed out the need to delimit the attributions of each professional, as well as referral flows that would allow the expansion of care. The organization of health services is structured in levels of care: primary, focused mainly on prevention and follow-up; secondary, in which the specialties are inserted; and tertiary for more emergency measures, assuming the articulation between them.[32] Especially with regard to diabetic foot ulcers, referral and counter-referral should be exercised so that the patient has comprehensive care. Corroborating, the study points out that the follow-up of people with diabetes requires a multidisciplinary team composed mainly of a general practitioner, vascular surgeon, podiatrist and endocrinologist. Prior to the above, referral to secondary care and specialized bodies is extremely necessary and beneficial for people with diabetes.

Thus, the context of care for people with diabetes brought by the participants signals the need for public policies that enhance and operationalize the care network. Multiprofessional care is one of the ways to offer comprehensive care, aiming at the subject in his/her various needs, which is beneficial for the prevention of foot ulcers in diabetic people because it can occur due to multifactorial causes.

Therefore, training professionals in comprehensive care for people with diabetes, preparing them for the prevention of foot ulcers, is characterized as an investment that can minimize the individual and collective implications of the condition. This professional training has greater potential when the construction of knowledge occurs collectively, providing reflection on praxis and transforming realities.

The main limitation of the study lies in the impossibility of some nurses to participate in the research, given the compromise of the staffing dimensioning, in addition to the district being in the vaccination phase against Covid-19, which increased the demand of the units.

Final Consideration

The construction of the social technology for the prevention of foot ulcers in diabetic people took place with the participation of nurses working in PHC, who collectively proposed the necessary elements to compose the screening worksheet. Such social technology encompasses the needs of patient identification, knowledge of clinical history, follow-up of diabetes and its possible complications, items for screening, in addition to determining referrals.

The technology built reveals the need of a specific audience and directs a solution to the problem faced. It is thus believed to contribute with social, professional and scientific impact. It is understood that the visibility and deepening of the theme will result in the provision of a qualified, humanized and effective service for diabetic people assisted in PHC, with a reduction in preventable diseases, expansion of screening and prevention of foot ulcers in these people, reduction of morbidity and mortality, improvement of healthy lifestyle habits and cost reduction for the SUS.

Although it is limited to having covered nurses from only one health district of the municipality, the technology built reveals the need for a specific audience and directs a solution to the problem faced. In addition, the study advances in the sense of providing ease and practicality in the care of the target population, which is a large part of the patients treated throughout PHC, and can serve as a model for use in other units. It can also contribute to the discussion about the prevention of foot ulcers in diabetic people within the care network, encouraging continuing education for the training of health professionals and thus improving the quality of care.

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