







ORIGINAL ARTICLE

Educational program for self-care of the feet in diabetic patients

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ABSTRACT

Introduction: diabetic patients have special reasons to take care of their feet, the tragedy of an amputation makes us think about the complexity of their education.

Objective: to design a proposal for an educational program to modify self-care of the feet in diabetic patients.

Methods: a research was conducted in health system and services in the period from January to December 2018 in the 22nd and 23rd medical offices of the “Marta Abreu” Polyclinic. The population consisted of diabetic patients with a diagnosis of grade 0 risk foot, less than five years of evolution of the disease, between 50 and 70 years old. The sample (45) was selected by non-probabilistic intentional sampling. The variables age, sex and schooling groups and those related to self-care of the feet were operationalized. Observation, documentary review, unstructured interview, questionnaire and participatory techniques were used to obtain the information.

Results: the application of the instruments showed that most of the patients were female, were between 61 and 70 years of age and had poor self-care of their feet.

Conclusions: based on these results, an educational program was designed with a participatory methodology, which was evaluated by a group of specialists and accepted for implementation.

Key words: diabetes mellitus; diabetic foot; self-care; educational program

RESUMEN

Introducción: los pacientes diabéticos tienen motivos especiales para cuidar de sus pies, la tragedia de una amputación hace pensar en lo complejo de su educación.

Objetivo: diseñar una propuesta de programa educativo para modificar el autocuidado de los pies en pacientes diabéticos.

Métodos: se realizó una investigación en sistema y servicios de salud en el período de enero a diciembre de 2018 en los consultorios médicos 22 y 23 del Policlínico “Marta Abreu”. La población estuvo conformada por los pacientes diabéticos con diagnóstico de pie de riesgo grado 0, menos de cinco años de evolución de la enfermedad, entre 50 y 70 años. La muestra (45) fue seleccionada mediante muestreo no probabilístico intencional. Se operacionalizó las variables grupos de edad, sexo y escolaridad y con las relacionadas con el autocuidado de los pies. Se empleó la observación, la revisión

documental, la entrevista no estructurada, el cuestionario y técnicas participativas en la obtención de la información.

Resultados: la aplicación de los instrumentos arrojó que la mayoría de los pacientes eran del sexo femenino, se encontraban en el grupo de edad de entre 61 y 70 años y tenían mal autocuidado de los pies.

Conclusiones: basado en estos resultados se diseñó el programa educativo con metodología participativa, que fue valorado por un grupo de Especialistas y aceptado para su implementación.

Palabras clave: diabetes mellitus; pie diabético; autocuidado; programa educativo

INTRODUCTION

The diabetic foot is one that presents an anatomical or functional alteration determined by neurological abnormalities and varying degrees of peripheral vascular disease (or both) in a diabetic patient, which confers an increased susceptibility to infection and ulceration and destruction (or both) of deep tissues.⁽¹⁾

This alteration is due to multiple factors, but neuropathy is the main component. The affection of the nerve fibres causes different alterations in the feet: loss of sensitivity (sensitive fibres), with the risk of not perceiving aggressions; muscular atrophy (motor fibres), with alterations in the distribution of loads and deformities that generate changes and increases in pressure in certain areas that stimulate the appearance of hyperkeratosis and anhidrosis (autonomic fibres), which favour dryness of the skin and the appearance of cracks.^(2,3)

These conditions can be compounded by reduced arterial flow due to peripheral vascular disease, which complicates the delivery of nutrients, oxygen or antibiotics and, consequently, the treatment of infections or the healing of an injury. In this situation, tight footwear, improper handling of nails or calluses, walking barefoot and exposure to a nearby heat source can lead to injury. If an infection also occurs, the risk of amputation of the affected limb increases.^(3,4)

Other factors also influence the degree of complication: previous ulceration or amputation, smoking, advanced age, long duration of diabetes, lack of diabetes education, and poor foot care and hygiene.⁽⁴⁾

Prevention of diabetic foot disease begins with the identification of each patient's risk for diabetic foot disease. The new concept of the at-risk foot refers to any individual with diabetes mellitus in whom any type of peripheral neuropathy or arthropathy, including toe alignment disorders, structural foot deformities and Charcot foot, is demonstrated in their feet, however minimal. The concept of at-risk foot does not include ulceration and active infection of the foot.⁽⁵⁾

In order to establish a uniform risk stratification into different levels or grades for prioritising ulcer and amputation prevention actions, there is a classification proposed by the International Diabetic Foot Consensus, which establishes four categories ranging from 0 to 3 in which the higher the category, the higher the risk of diabetic foot.⁽⁵⁾

Each year approximately four million people develop foot ulcers. The estimated prevalence varies from country to country, and is approximately 1.5-10%, with an incidence between 2.2 and 5.9%.⁽⁶⁾

At the “Arnaldo Milián Castro” University Clinical-Surgical Provincial Hospital in the city of Santa Clara, Villa Clara Province, 29% of the patients requiring these services are admitted to the Angiology Ward for this cause. In Santa Clara, in 2017, a total of 16,276 diabetic patients were reported, of whom 835 were treated with heberprot-P for diabetic foot ulcers.⁽⁷⁾

In December of the same year, 276 patients with this complication were reported at the Podiatry Clinic of the “Marta Abreu” Teaching Polyclinic in the city of Santa Clara, Villa Clara Province, of whom 36 presented ulceration and six suffered amputation of some portion of the foot, resulting in hospitalisation and, in some cases, disability. Of all the family medical practices in this institution, the 22nd and 23rd in Basic Work Group 2 reported the highest number of diabetic foot cases, and the most affected age range was 50 to 70 years.

Among the most common causes that triggered these lesions were inadequate habits and self-care practices:

- Podiatric self-treatments
- Trauma from barefoot walking
- Friction from wearing inappropriate footwear
- Dermopathies due to inadequate foot hygiene
- Untreated hyperkeratosis.

This situation motivated the search for alternatives that could contribute to the modification of foot self-care in these patients in order to, in some way, have an influence on the reduction of amputation rates. The aim of this research is to design a proposal for an educational programme to modify self-care of the feet in diabetics belonging to the 22nd and 23rd medical clinics of the “Marta Abreu” Polyclinic.

METHODS

An investigation was carried out in the health system and services in the period from January to December 2018 in the 22nd and 23rd medical offices of the “Marta Abreu” Polyclinic.

The population consisted of diabetic patients with a diagnosis of grade 0 risk foot, less than five years of evolution of the disease, between 50 and 70 years of age. The sample (45) was selected by non-probabilistic purposive sampling.

It was worked with the epidemiological variables age, sex and schooling groups and with those related to self-care of the feet.

Self-care of the feet: actions related to foot care taken by the individual based on three dimensions:

1. Information about foot self-care measures: knowledge that patients have about actions they can take on their own to prevent the occurrence of foot complications
2. Foot self-care habits: habits acquired by the frequency of repetition of an act or exercise based on foot hygiene and foot care.
3. Foot self-care practices: actions performed by the individual with the application of previously acquired knowledge about foot care.

As empirical methods of data collection, the following were used:

- Documentary review: we worked with podiatric medical records to obtain primary information, with the Statistical Records of the institution and with the National Diabetes Programme (as a guide for the design of educational activities).
- University of Malaga diabetic foot self-care questionnaire (modified APD-UMA questionnaire): this was used to diagnose the epidemiological variables (age, sex and schooling) and two of the variables related to foot self-care (information about foot self-care and foot self-care habits).
- Observation: an observation guide was applied to patients through physical inspection of the patient's feet and footwear in order to diagnose another of the variables related to foot self-care (foot self-care practices).
- Unstructured interview and participatory techniques.

Once the results of obtaining the information related to self-care of the feet were triangulated, then it was evaluated as good, fair and bad.

It was necessary to evaluate by criteria of Specialists in order to know the evaluations related to the proposal, for which a process of cascade and saturation information was carried out; the following criteria were taken into account for the selection of the Specialists:

- Professionals of recognised academic and institutional prestige with more than 10 years' experience as graduates, with experience in the design of educational programmes and research and publications related to the subject of the research.

The sample of evaluators finally consisted of six Specialists:

- A First Degree Specialist in General Comprehensive Medicine and Endocrinology
- A Specialist in General Comprehensive Medicine, with a diploma in diabetic foot care
- One First Degree Specialist in Angiology and Vascular Surgery
- A Graduate in Nursing, with a diploma in diabetic foot care
- A Graduate in Podiatry, with a diploma in diabetic foot care
- A Graduate in Psychopedagogy.

Prior to delivery of the designed product, the specialists evaluated it based on the following indicators: structure, relevance, usefulness, feasibility and pedagogical scientific value. The evaluative categories used were: accepted and not accepted.

The information obtained was placed in an Excel file and processed with the SPSS version 20.0 statistical program. Descriptive statistical analysis was performed using absolute frequencies (numbers) and by hundreds as summary measures.

Ethical considerations: consent was requested from the management of the polyclinic and from each of the patients under investigation to participate in the study.

RESULTS

The predominant sex in the study sample was female (73.3%) and the age group 61 to 70 years (55.6%). According to schooling, in equal proportions, patients with high school and intermediate technical level prevailed (24.4%),

followed by those who only reached primary level (22.2%); in the group aged 61 to 70 years, primary level was predominant, while in the group aged 50 to 60 years, pre-university level was predominant (Table 1)

Table 1. Distribution of diabetic patients according to age groups and schooling

Education	Age groups (years)				Total	
	50 - 60		61 - 70		No.	%
	No.	%	No.	%		
Elementary	0	0.00	10	40.0	10	22.2
High School	2	10.0	9	36.0	11	24.4
Pre-university	7	35.0	1	4.00	8	17.8
Technical High School	6	30.0	5	20.0	11	24.4
University	5	25.0	0	0.00	5	11.2
Total	20	44.4	25	55.6	45	100

In both groups, there was a prevalence of poorly rated information on self-care measures for feet (84.3%), with higher percentages in the 61-70 years age group (100%) compared to 65% in the 50-60 years age group.

As is illustrated in Figure 1, 100% of adults aged 61-70 years scored poorly on information about self-care measures for feet; in the group aged 50-60 years it was 65%. In relation to self-care habits and practices, in both groups, more than 75% were rated poorly.

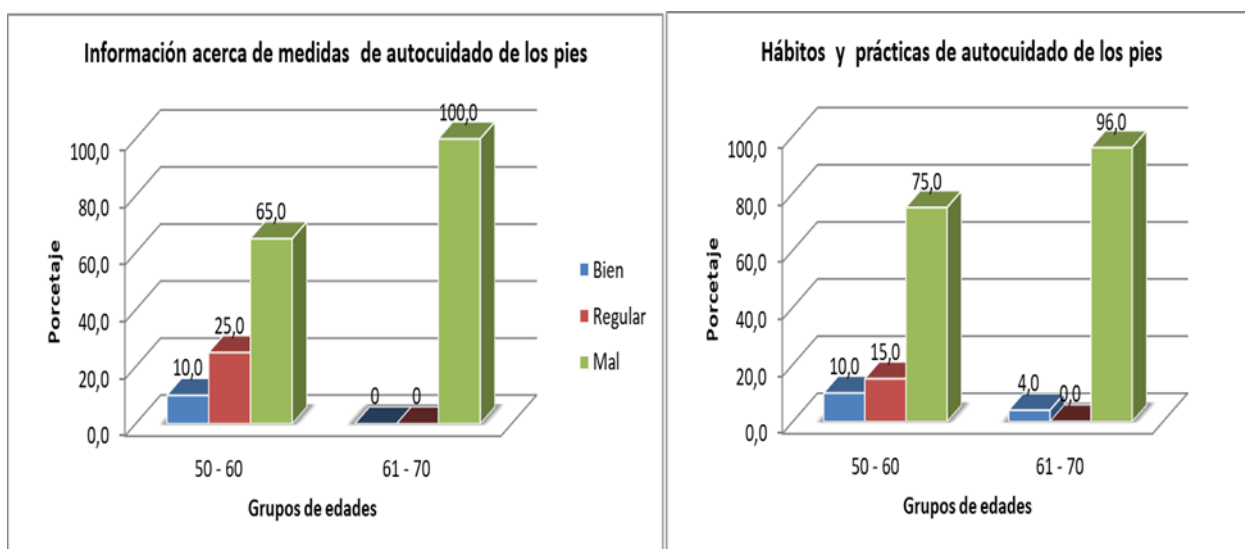


Figure 1. Distribution of diabetic patients according to information about foot self-care measures, foot self-care habits and practices by age group

Among the poor self-care practices, the most common were wet and macerated interdigital spaces, dry and fissured skin, untreated hyperkeratosis, fungal toenails and the use of open and flat shoes.

The results of the above dimensions allowed measurement of the foot self-care variable. There was predominance of patients with poor evaluation (86.6%), in the age group of 61-70 years 96% and 50-60 years 75% of patients (Table 2).

Based on these results, an educational program was designed (Table 3) based on participatory methodology with the aim of contributing to the modification of self-care of the feet in diabetic patients. It was finally organized in seven

workshops in which presentation, reflection, animation and didactic-educational techniques were used, and a consultation leaflet was provided (Annex 1).

Table 2. Distribution of diabetic patients according to foot self-care and age groups

Foot self-care	Age groups (years)				Total	
	50 - 60		61 - 70			
	No.	%	No.	%	No.	%
Good	1	5.00	1	4.00	2	4.50
Regular	4	20.0	0	0.00	4	8.90
Bad	15	75.0	24	96.0	39	86.6
Total	20	44.4	25	55.6	45	100

Table 3. Foot self-care education program for diabetic patients

Objective

To contribute to the modification of foot self-care in diabetic patients through the acquisition of knowledge, habits and healthy practices that prevent or delay complications in this anatomical area.

Strategy

Limits: Health area of the Polyclinic "Marta Abreu"

Space: Rehabilitation Room

Beneficiaries: Groups of diabetic patients (No more than 15)

Executors: Author of the thesis and team of podiatrists of the "Marta Abreu" Polyclinic

Procedure: Use of participatory techniques that facilitate reflection, dialogue and analysis

Frequency: weekly (2 hours)

Evaluation: evaluative tools such as PNI (positive, negative and interesting), control questions and other techniques.

Temas

1. Introduction and presentation of the program
2. Diabetic foot. Risk factors and triggering causes.
3. Self-examination of the feet and footwear.
4. Requirements for proper foot hygiene
5. Foot care
6. Footwear in diabetic patients
7. Feet...a pair for life...

DISCUSSION

Education of people with diabetes is an essential component of prevention and treatment strategies that does not replace medical treatment, but provides the necessary stimulus for radical lifestyle change. New approaches to health promotion recognize that diabetes education is an indispensable aspect of treatment if the active participation of people with diabetes in the management of their disease is to be ensured.

Currently, education in diabetic foot care is mainly directed towards patients with a history of complications, especially those with increased levels of glycosylated hemoglobin and diabetics with several years of evolution; however, patients with profiles that qualify as low risk, not presenting neuropathic alterations, can develop complications relatively quickly in the absence of good glycemic control and inadequate self-care practices.^(2,8,9)

The complication in the lower limbs is a relevant problem that is solved by the daily care of people with diabetes; however, there is still much to be done to reduce the risk of amputations, so the implementation of educational,

preventive and care strategies is an important tool to promote healthy lifestyles that ensure a better quality of life for these patients.⁽¹⁰⁾

The present study aims to prevent diabetic foot from the social dimension through the knowledge and promotion of behaviors related to adequate habits and practices of self-care of the feet, for which the authors decided to include epidemiological variables such as age, sex and schooling in the previous characterization of the sample. These variables have been taken into account by other researchers on the subject when designing educational interventions because they can modify the results expected to be achieved.

The results obtained regarding the distribution of patients according to age and sex groups were similar to those of other authors who in their studies show that the greatest number of patients were above 60 years of age, with a predominance of the female sex over the male sex.^(2,11)

In the publications consulted, it has been shown that men have a higher risk of ulceration than women, either because they are the ones who visit the Podiatry Service more often, or because they take greater care of their feet.⁽¹²⁾

The authors consider that the distribution of patients is due to the intention and the criteria established for the study, in addition to what is established by the criteria of intention in the sampling used.

With respect to age in this disease, as the years advance, the longer the subject is exposed to hyperglycemia states, which leads to the intensification of the risk of diabetic foot and the severity of complications, a situation that leads to the demand for greater resources and health services for this population group, which is a challenge for the Cuban health system.⁽²⁾

In the analysis of the schooling variable, it was found that in the age group from 50 to 60 years, the pre-university level predominated, while in the age group from 61 to 70 years, the primary level predominated. These results contrast with those of other authors who show in their studies that the predominant level of schooling was elementary or uneducated.⁽¹³⁾

The relationship between schooling and the information about self-care measures achieved by the patients are discussed in different researches consulted, in which it is stated that the low level of schooling may limit the access to information due to the possible compromise of reading, writing, comprehension or speech skills, a condition that may reduce the access to learning opportunities related to health care.^(13,14,15)

It has been shown that many of these people also do not seem to value preventive actions against diseases and usually delay seeking medical care, a situation that has repercussions on the appearance of diabetes complications, such as diabetic foot.⁽¹⁴⁾

In this sense, health professionals should consider this variable and seek diversified and innovative teaching strategies that are able to mobilize people with diabetes in the search for self-care.

In the dimensions of self-care of the feet during the diagnostic stage, summarized in Table 2, showed the predominance of patients with bad information about the measures of self-care of the feet, as well as bad habits and practices in both dimensions, which in this sense characterized the sample, which determined a bad self-care of the feet in 86.6% of the patients expressed in Table 3.

It resulted, in addition to this variable, that the age group with the highest number of patients evaluated with this category was 61 to 70 years old, while in the 50 to 60 years old group, five patients presented good and regular self-care of the feet.

This information confirms the need for people to receive educational actions for prevention and self-care of the feet, taking into account that most of them come to the health services when they present lesions in advanced stages and with a greater possibility of amputation.

Self-care, in this sense, is insufficient and favors behaviors that could increase the probability of suffering from diabetic foot and lower limb amputations in their study sample, all of which could be modified through more effective educational interventions in order to avoid the appearance of complications.⁽¹⁴⁾

Several researches have determined that through educational intervention ulcers are prevented by reducing the impact of inadequate self-care habits of the feet, especially by avoiding accidental damage, through the adoption of preventive behaviors such as controlling the temperature of bath water, avoiding walking barefoot and promoting foot health through washing, drying, daily hydration and self-examination.⁽⁸⁾

These health promotion and education activities allow the subjects, by appropriating information related to the disease, to assume a change in their attitude towards self-care; practice is considered the action of carrying out ideas, plans and projects thanks to the application of previously obtained knowledge.

Most of the studies consulted have found insufficient self-care of the feet in diabetic patients prior to the implementation of educational interventions, which after their execution have shown significant changes in this variable.^(12,13)

In these investigations the subjects have managed to understand their degree of risk and the importance of assuming this care to avoid complications, so it is inferred that they are effective in promoting positive behaviors of self-care of the feet, which according to statistical data can prevent 85% of amputations.

Based on the results obtained through the application of the instruments selected for this study and taking into account the criteria of other authors who have investigated the subject in question, we proceeded to design an educational program capable of contributing to modify the self-care of the feet in these diabetic patients who made up the sample. The program consists of seven workshops given with a weekly frequency of 90 minutes duration for each session; the material conditions and individual characteristics of the patients are considered.

The following techniques are included:

- Presentation: at the beginning of the day to allow for the integration of the participants.
- Reflection: during the program to reflect on the different topics.
- Animation: after intense and tiring moments to integrate and rest the participants.
- Didactic and educational, based on the dialogic relationship: brainstorming, demonstration and group discussion are used, among others, which are favorable to allow the analysis of different attitudes related to self-care of the feet, stimulating cohesion and communication in the group as starting points to assimilate the need for change.

Among the topics to be addressed are the following:

1. Introduction and presentation of the program: the objective is to motivate all participants by explaining the importance of the educational program, using the brainstorming technique. In this meeting, the participants, the health team and the educational actions to be developed are presented.
2. Diabetic foot, risk factors and triggering causes: it is carried out to characterize the diabetic foot, taking into account its risk factors and triggering causes, using reflective techniques through questions, with answers that sensitize patients to situations that could affect it if the necessary measures are not taken in time.
3. Self-exploration of feet and footwear: its objective is to explain the clinical manifestations of the most frequent podological affections that constitute alarm signs in diabetic patients and the conduct to assume in each particular case, as well as to demonstrate the techniques for the self-exploration of feet and footwear as preventive measures through a workshop.
4. Requirements for foot hygiene: its objective is to explain the necessary requirements for an adequate foot hygiene through demonstrative techniques such as nail cutting, foot and nail washing and correct drying of the feet due to the importance of its application in diabetic patients to avoid the establishment of dermatophytosis and ingrown toenails, among other complications.
5. Foot care: aims to argue the importance of assuming other foot care related to the maintenance of daily hydration of the skin of the legs and feet, visiting the podiatrist monthly and the characteristics of the stockings or socks to be used by diabetic patients through group discussion.
6. Footwear in diabetic patients: the objective is to determine the characteristics of footwear in diabetic patients and the precautions for its use, through group discussion, supported by the use of Information and Communication Technologies (ICT).
7. Feet...a pair for life...: the objective is to verify the incorporation of the contents addressed in the educational program in the modification of attitudes related to self-care of the feet through the technique: How to keep my feet healthy?

This activity is carried out to find out if the level of information has been improved and if the attitudes regarding self-care of the feet have been modified based on the contents addressed in the different meetings.

Afterwards, a participatory animation technique is executed: "I'm going on a trip", to stimulate cohesion and interrelation among the members of the group, which in turn constitutes the farewell or closing of the educational program.

Procedure: everyone sits in a circle. Start by saying: "I'm going on a trip and I'm taking a hug" and hug the person on your right. Then that person has to say "I'm going on a trip and I'm taking a hug and a pat on the back" and gives the person on their right a hug and a pat on the back. Each person repeats what has been said and adds a new action to the list. It will continue until everyone has had their turn, in this way the group members say goodbye to each other and the educational program is closed.

The Specialists evaluated the program through the proposed indicators and considered the designed product as acceptable for implementation. A favorable element was the fact that in no case were negative criteria observed regarding the parameters measured, which gives the proposal a notorious degree of validity. Suggestions for its optimization were offered, which were taken into account for its definitive conformation and were extremely useful for the outcome of the research.

One of the limitations of the research consists in the fact that the results cannot be generalized because we worked with a non-probabilistic sampling, taking into account the selection criteria deemed necessary by the research team. The medical-social contribution of this educational program is undeniable because it constitutes the first results of a project contracted with the vision of being extended, improved and even shared with the Provincial Group for the care of patients with diabetes mellitus as part of the suggestions made by the Specialists who evaluated the program.

CONCLUSIONS

Based on the results obtained with the application of the instruments selected for this study and taking into account the criteria of other authors who have investigated the subject in question, we proceeded to design an educational program based on participatory methodology, capable of contributing to modify the self-care of the feet in the sample group, which was evaluated by specialists and accepted for implementation.

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ANNEXES

¿POR QUÉ ES IMPORTANTE EL CUIDADO DE LOS PIES EN PERSONAS CON DIABETES?

Porque al padecer diabetes, tienes un **PIE DE RIESGO**

El pie diabético es una de las principales complicaciones de la diabetes mellitus (DM), y es causa frecuente de amputación de miembros inferiores. Un 15% de los pacientes con diabetes podrá desarrollar problemas en sus pies a lo largo de su vida.

La diabetes puede producir problemas de salud como alteraciones en la circulación, disminución de la sensibilidad nerviosa y mayor riesgo de padecer heridas; éstas debido a la falta de circulación serán de lenta y difícil curación, con gran peligro de infecciones, pre-disponiendo todo esto a padecer pie diabético.



¿Qué es un Pie de Riesgo?

El pie de una persona con diabetes, aunque no presente lesiones, tiene una alta probabilidad de desarrollarlas porque presenta condicionantes de riesgo. Cuando aparece una lesión, ya es considerado un PIE DIABÉTICO.

Recuerda...

Tú puedes evitarlo

La persona que conoce su diabetes vive mejor.

Tener bien controlada la diabetes es lo principal para evitar la aparición de un pie diabético.

Ante cualquier problema en tus pies consulta con los profesionales sanitarios.

Si tienes diabetes... cuida tus pies



UN PAR PARA TODA LA VIDA

RECOMENDACIONES		
<p>1. Revisa a diario tus pies. Si no puedes, pide ayuda. Busca lesiones como rozaduras, grietas, zonas enrojecidas, ampollas, cortes o heridas.</p> 	<p>4. Lima tus uñas con lima de cartón o córtalas rectas con tijera de punta roma. NO debes dejarlas muy cortas. Si no puedes hacerlo solo, pide ayuda o acude a tu podólogo.</p> 	<p>7. NO apliques calor o frío directamente en tus pies ni camines descalzo. Puedes tener menor sensibilidad y sufrir lesiones sin darte cuenta.</p> 
<p>2. Lava diariamente tus pies con agua templada y jabón neutro, no más de 10 min, y sécalos bien; sobre todo entre los dedos.</p> 	<p>5. NO trates tus pies con productos callicidas, antisépticos colorantes ni cuchillas. Ante cualquier lesión, lava, seca, tapa con apósito estéril y acude a un profesional sanitario.</p> 	<p>8. Haz ejercicio de forma regular cuando no esté contraindicado, utiliza para ello un calzado y calcetín adecuado.</p> 
<p>3. Hidrata bien tu piel, por dentro y por fuera; bebe agua frecuentemente, si no está contraindicado, y aplica crema por tus pies y piernas, pero NO entre los dedos.</p> 	<p>6. Utiliza siempre un calzado y calcetín adecuado. El calcetín debe ser de fibra natural y sin elástico. El calzado debe ser flexible, que no oprima, antideslizante y sin costuras internas. Compra los zapatos al final del día.</p> 	<p>9. No fumes, no bebas alcohol y haz una dieta equilibrada.</p> 
		<p>10. Mantén controlada tu diabetes: - Conoce bien tu diabetes. - Sigue una alimentación adecuada. - Haz ejercicio físico a diario. - Mantén a raya las cifras de glucemia. - Cuida y vigila tus pies.</p> 

Figure 2. Foldable foot self-care consultation table

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

CONTRIBUTION OF THE AUTHORS

AMA: supervision, resources, project management, original drafting, writing (review and editing).

TÁV: conceptualization, validation.

BMR: data curation.

LPJ: research, fund acquisition, validation.

ALP: formal analysis, validation.

EGM: research.