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## Research Article

### EFFECTIVENESS OF INTERVENTIONS TO IMPROVE CARE HABITS IN THE PREVENTION OF DIABETIC FOOT: SCOPING REVIEW

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Diabetic foot, Quasi-experimental, Care habits, Scoping review.

#### ABSTRACT

**Introduction:** The importance of the study lies in redirecting future interventions for the prevention of the diabetic foot.

**Objective:** To compare the effectiveness of interventions and to improve care habits in the prevention of the diabetic foot.

**Experimental section:** The panoramic review methodology was used. Terms designed to identify quasi-experimental and qualitative studies related to the prevention of diabetic foot were used. The articles were analyzed by summarizing them in a systematic matrix, creating axis of analysis, matrix analysis and exposure axis to generate a structure for writing the manuscript.

**Results:** The analytical synthesis produced five topics: knowledge and practices for the care of the feet; interventions as modifiers of knowledge and habits of care in the feet; structure and components of interventions for the prevention of diabetic foot; education for health with respect to diabetic foot; and, limitations to modify the habits of care in the feet.

**Conclusions:** Effective interventions, which proved to be the best for positively modifying the habits of foot care, for the prevention of diabetic foot in people with diabetes mellitus, were based in an educational theory, including practical workshops and games, for groups from 10 to 20 people with the involvement of family or friends.

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## INTRODUCTION

The objective of the scoping review is to evaluate and to compare the effectiveness of the interventions to improve the care habits in the prevention of the diabetic foot, identifying the research emptiness in the current literature. The transcendence of the study lies in redirectioning the structures and the components of future interventions that can be done to modify the care habits for the prevention of the diabetic foot in people with diabetes mellitus (DM).

With this scoping review relevant ideas are added about the knowledge and practices for the caring of the diabetic foot, like the interventions realized by the people with DM, identifying the main factors related to the emergence of the diabetic foot, like the interventions done now that modify the knowledge and habits of how to take care of people, education for previous health that intervenes in the improvement of the care habits on the feet, which are the main limits for people to acquire the knowledge and habits to prevent the diabetic foot. Besides,

how to structure an intervention and which component are primordial to achieve to modify in a positive manner the knowledge of the care habits to prevent the diabetic foot.

#### Experimental section

A scoping review was made inspired in the methodological frame of Arksey *et al.* (1) and Levac *et al.* (2).

The research questions were developed by a discussion to focus the review in: an objective population (people with DM); a concept (care habits); and a health condition (diabetic foot). The question was: Which is the effectiveness for the interventions to improve the care habits to prevent the diabetic foot in people with DM?

To identify relevant studies key words were used in the searches. These key words were established by an iterative process. A wide search strategy was used and the words were: diabetic foot, care habits, intervention and qualitative. A table was made to identify the possible synonyms of the key words in English and in Spanish. Table 1.

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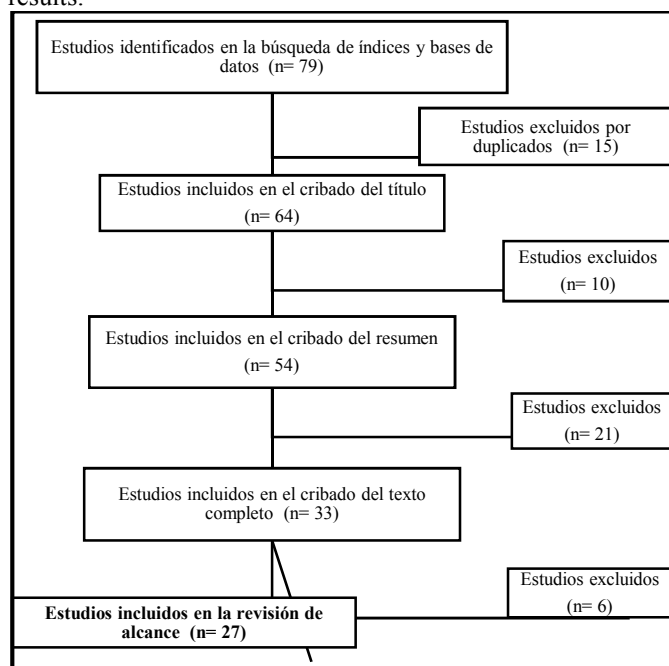
**Table 1** Keywords in Spanish and English in the scoping review about the effectiveness of the interventions to improve the caring habits to prevent the diabetic foot in people with DM 2014-2018.

<i>Diabetes mellitus</i> <b>Diabetes mellitus</b>	<i>Intervention</i> <b>Intervención</b>	<i>Care habits</i> <b>Hábitos de cuidado</b>	<i>Qualitative</i> <b>Cualitativo</b>
<i>Diabetic foot</i> Pie diabético	<i>Quasi-experimental</i> Cuasi-experimental	<i>Habits</i> Hábitos	<i>Qualitative research</i> Investigación cualitativa
<i>Diabetic foot ulcers</i> Úlceras del pie diabético	Diabetes mellitus, Experimental Diabetes mellitus, Experimental	<i>Attitudes</i> Actitudes	<i>Narratives</i> Narrativa
<i>Charcot foot</i> Pie de Charcot	<i>Non-randomized Controlled trials as topic</i> Ensayos controlados no aleatorios <i>Early medical intervention</i> Intervención médica temprana <i>Early intervention</i> Intervención temprana	<i>Hygiene habits</i> Hábitos de higiene  <i>Care model</i> Modelo de cuidado  <i>Self care</i> Autocuidado	<i>Phenomenology</i> Fenomenología  <i>Ethnography</i> Etnografía  <i>Interview</i> Entrevista  <i>Observation</i> Observación <i>Focus group</i> Grupos focales <i>Grounded theory</i> Teoría fundamentada <i>Hermeneutics</i> Hermenéutica <i>Field work</i> Trabajo de campo <i>Content analysis</i> Análisis del contenido <i>Discourse analysis</i> Análisis del discurso <i>Ethnology</i> Etnología <i>Ethnomethodology</i> Etnometodología

Source: Self-elaborated.

A posteriori, index searches and data bases were made between September and November of 2018 in the following bases PubMed, ERIC, SciELO, Redalyc, Google Académico, JAMA y Scopus. The next criteria was used for the references: articles written in English, Spanish and Portuguese to an international level ignoring the data, interventions about the care habits of the feet, interventions for the diabetic foot, quasi-experimental studies, educative interventions, and quantitative research.

Studies made twixt 2014 and 2018 were used. Figure 1. Relevant articles were analysed summarizing them in a systematic matrix, by the author, objective, methodology and results.

**Figure 1** Selection process of the studies in the scoping review of the effectiveness of the interventions to improve the caring habits for the prevention of the diabetic foot in people with DM, 2014-2018.

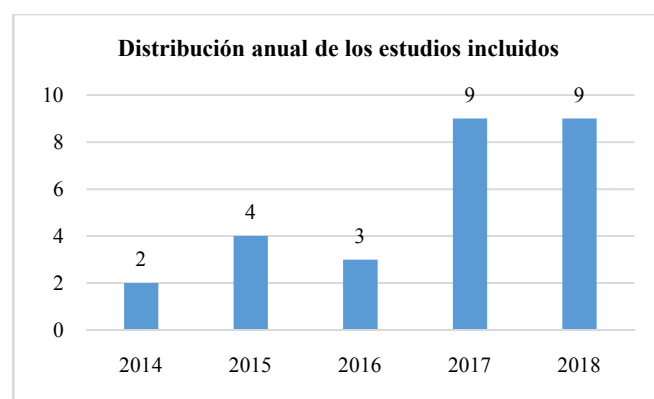
Source: Self-elaborated.

10 analytic axis were created to apply them to the systematic matrix, to elaborate each axis in different matrix for a scheme, then exposition axis were made to generate a text structure.

### Main Headings of Contents

The 5 topics were: knowledge and practices for the care of the feet. Interventions as modifiers of knowledge and care habits on the feet. Structure and components for the interventions of the diabetic foot. Education for health relating the diabetic foot. Limits to modify the care habits of the feet.

Figure 2 states the publishing of the 27 articles included, and shows the emerging nature of the literature.

**Figure 2** Annual distribution in the included studies of the review of the scoping review of the effectivity of the interventions to improve the caring habits for the prevention of the diabetic foot in people with DM, 2014-2018.

Source: Self-elaborated.

Table 2 details the study methods, such as the visual representation of the 27 articles.

**Table 2** Included studies for the scoping review for the effectiveness in the interventions to improve the caring habits to prevent the diabetic foot in people with DM, 2014-2018.

Autor y año	País	Metodología	Temas cubiertos en el estudio					
			Conocimientos y prácticas para el cuidado de los pies	Intervenciones como modificadoras de conocimientos y hábitos de cuidado en los pies	Estructura y componentes de las intervenciones para la prevención del pie diabético	Educación para la salud con respecto al pie diabético	Limitantes para modificar los hábitos de cuidado en los pies	
Couselo-Fernández-2018	España	Cuantitativo Transversal, observacional, descriptivo	X				X	
Elías-2018	México	Cuantitativo Cuasi experimental		X		X		
García-2018	Cuba	Cuantitativo Cuasi experimental				X		
Godoy-2018	Chile	Cualitativo Estudio de caso					X	
Hadi-2018	Indonesia	Cuantitativo Cuasi experimental		X		X		
Hemmati-2018	Irán	Cuantitativo Cuasi experimental		X		X		
Kolltveit-2018	Noruega	Cualitativo Metodología de Descripción Interpretativa						X
Medina-2018	Cuba	Cuantitativo Cuasi experimental				X		
Sharoni-2018	Malasia	Cuantitativo Cuasi experimental		X		X		
Abdelsalam-2017	Egipto	Cuantitativo Cuasi experimental		X		X		
Adarmouch-2017	Marruecos	Cuantitativo Cuasi experimental				X		
Al Hariri-2017	Arabia Saudita	Cuantitativo Estudio transversal	X					
Bahador-2017	Irán	Cuantitativo Cuasi experimental		X		X		
Bonner-2017	Estados Unidos	Cualitativo Fenomenológico	X					X
Greenwell-2017	Reino Unido	Cualitativo Fenomenológico	X					
Sayampanathan-2017	Singapur	Cualitativo Fenomenológico	X					
Sekhar-2017	India	Cuantitativo Cuasi experimental				X		
Sharoni-2017	Malasia	Cuantitativo Cuasi experimental		X				
Chapman-2016	Cuba	Cuantitativo Cuasi experimental	X				X	
Santana-2016	Brasil	Cualitativo / Cuantitativo Estudio de método mixto	X					
Schoen-2016	Australia	Cuantitativo Cuasi experimental		X		X		
Delea-2015	Irlanda	Cualitativo Fenomenológico					X	X
Guell-2015	Barbados	Cualitativo Fenomenológico						X
Perez-2015	México	Cuantitativo Cuasi experimental	X	X		X		
Wendling-2015	Estados Unidos	Cualitativo Constructos de la teoría cognitiva social, la teoría cognitiva social de Bandura.					X	
Chin-2014	Taiwán	Cuantitativo Cohorte longitudinal prospectivo analítico					X	
MakkiAwouda-2014	Sudan	Cuantitativo Cuasi experimental				X		

Source: Self-elaborated.

**Knowledge and practice to take care of the feet**

Twixt 51 and 80% of people with DM checked their feet daily (3) (4) (5).

5 of the articles (18.5%) (4) (5) (6) (7) (8) stated that people with DM knew how to check their feet, between 77% and 81% of the people used to check their feet (4) (5).

According to Bonner *et al.* (9) the vast majority of people with DM associated the basic care of the foot with hygiene. Likewise, Sayampanathan *et al.* (10) most of the patients have some knowledge about it.

**Interventions as modifiers of knowledge and care habits of the feet.**

*Interventions as modifiers of knowledge in the care of the feet.*

As established by Sharoni *et al.* (11) (12) 21% of the knowledge about the care of the feet augmented in the experimental group until the beginning of week 4, in addition to an increase of 16.5% in the 12<sup>th</sup> week of reference, with a value of 0.77 of the sphericity test of Mauchly, being a significant statistic.

According to Pérez *et al.* (8) the 55.8% of the people who answered the pre-test were located at a 'good' degree of knowledge, with a 88.4% and 89.6% in the post-test 1 and 2 for the knowledge level of 'very good,' in relation with the care of the feet.

As Elías and González (13) mention that just the 0.4 of the mean increased in the knowledge of the care of the feet in the experimental group. But according to Abdelsalam *et al.* (14) 8 was the increase of the mean in the pre-test and post-test, a 43% of increase in the knowledge to take care of the feet.

Interventions used in camps and workshops showed an increase of knowledge on taking care of the feet. In camp activities 3 was the increase of the mean of the experimental group (15). In full time workshops 58% was the percentage of augmentation of the posterior knowledge in contrast to the previous grade (16).

**Interventions as modifiers of the habits in the care of the feet**

Hemmati *et al.* (17) stated that 24.3 was the difference between means before and after the intervention in the experimental group, in comparison to just 3.5 of difference of the means from the control group, talking about the activities about the self-care of the feet.

As established by Sharoni *et al.* (12) an increase of 14% was showed in the self-care of the feet in the experimental group since the beginning of week 4, adding an extra value of 0.46 of the test *Partial Eta Square* ( $\eta^2$ ) to estimate the effect size of the test, the behaviour of the self-care of the feet was considered as widespread.

In the interventions with a longer duration than 10 sessions, 100.6 was the mean increase of the auto-efficacy to take care of ulcers of the diabetic foot in the experimental group, counting a total of 12 sessions (18).

**Structure and components of the interventions for the prevention of the diabetic foot****Structure of the interventions**

Three main interventions were identified: educational, behavioural, and informative. The educational interventions were the most effective ones to the positive modification of the habits to take care of the diabetic foot. In discrepancy with the informative interventions. (16) (19) (20).

Educational interventions had better results to spread knowledge about how to take care of the diabetic foot, as Sharoni's *et al.* (12) case, it was based in the auto-efficacy theory from Albert Bandura with an emphasis in taking actions to promote auto-efficacy. Hemmati *et al.* (17) established in their intervention with the theory of the deficit of the self-care from Dorothea Elizabeth Orem.

No further differences were shown in the educational interventions realized with 5 sessions of less (13) (14) (15) (21) (22) and the interventions with 10 or more sessions (8) (18) (23).

**Components of the interventions**

The most used components for the interventions were power point presentations, brochures, and videos (8) (12) (13) (14) (15) (16) (18) (20) (21).

Leaving aside the interventions made by Bahador *et al.* (18), Hemmati *et al.* (17) and Pérez *et al.* (8) no further educational tools were included to improve the caring habits, like workshops or games.

**Health education for the diabetic foot**

Between 7% and 47% of the people with DM received a course about how to take care of their feet previous to an intervention (3) (24).

Delea *et al.* (25) stated that people with DM explained that they knew what they have to do to take care of their feet and minimize the consequences of the disease.

Chin *et al.* (26) and Wendling *et al.* (27) said that health education is a positive predictive factor in the behaviour of the auto-care of the foot. Going to lectures helped a lot of the people; revealing that education, at least once, is a predictive factor of the behaviours of the auto-care of the foot (27).

**Limits to modify the habits of how to take care the feet**

As Delea *et al.* (25) mentions that people with DM have personal tensions or other mental disorders. According to Guell and Unwin (28) people liked the medical attention and were content towards the nurses, medics and chiropodists, and had the maximum level of trust.

**Future prospects**

The educational interventions were based in a theory for their elaboration with the inclusion of practical workshops and games, being these for groups of smaller size, between 10 to 20 people with the involvement of family members or friends that demonstrated being to positively modify the knowledge and practices regarding care habits for the feet, for the prevention of the diabetic foot in persons with DM.

In contrast with the interventions that did not have a base theory for their elaboration, where only power point presentations were used and some brochures; the teaching method was exclusively based on the pathology of the person, and they did not present a significant improvement in the modification of knowledge and practices in how to take care of the feet.

The most important limits for the elaboration of these interventions were:

- The lack of another intervention to the control group, in which they only got the same treatment of the correspondent clinic, no other kind of intervention was being utilized to compare if the intervention was really that good. The people who applied the intervention decided to keep with the intervention they knew better and thought it was the best.
- The most common components used in the interventions were the power point presentations, brochures and videos, in which no other educational tools were included like the practical workshops and games.

Aside from the complexity of the disease, people with DM had personal tensions or psychological, adding to the problems already provoked by the diabetes, several were identified such as: changing their lifestyle, multiple health issues, family issues and the stress on how to handle medical lawsuits in their personal lives. A key topic is the importance of social support towards these people, in which the vast majority of people depended of a family member, couple, friend or neighbour, to assist them in their medical necessities and to participate in the proper caring habits that they needed to improve their health condition.

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