ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

CONSTRUCTION OF CARE-EDUCATIONAL TECHNOLOGIES ON PRESSURE INJURIES FOR ELDERLY PEOPLE AT HOME

CONSTRUÇÃO DE TECNOLOGIAS CUIDATIVO-EDUCACIONAIS SOBRE LESÃO POR PRESSÃO PARA IDOSOS NO DOMICÍLIO

CONSTRUCCIÓN DE TECNOLOGÍAS CUIDADO-EDUCATIVAS SOBRE LESIONES POR PRESIÓN EN PERSONAS MAYORES EN EL DOMICILIO

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ABSTRACT
Objective: to describe the process of building educational technologies for the prevention and treatment of pressure injuries, based on the needs of family caregivers. **Method:** participatory action research, divided into exploratory, main and evaluation phases, anchored in the Freirian methodological framework. Carried out with family caregivers and primary care professionals. To analyze agreement between examiners, the Content Validity Index was calculated. **Results:** 16 caregivers and 10 health professionals participated. The main non-compliance found was a lack of knowledge about pressure injury prevention. The educational action allowed the exchange of knowledge between the subjects who constructed, implemented and evaluated two educational technologies: a pressure injury prevention booklet and a repositioning disc. The booklet, in addition to being evaluated by caregivers, was validated for its content by expert judges. **Conclusion:** It is understood that it is necessary to recognize the health needs of populations and, based on these, propose strategies for care that is congruent with the real reality of subjects and their families. Dialogicity enabled the construction of relevant educational technologies in the context of health education to qualify family caregivers.
Keywords: Health of the Elderly; Educational Technology; Caregivers; Health Education; Pressure Ulcer.

RESUMEN
Objetivo: describir el proceso de construcción de tecnologías educativas para la prevención y tratamiento de las lesiones por presión, a partir de las necesidades de los cuidadores familiares. **Método:** investigación acción participativa, dividida en fases exploratoria, principal y de evaluación, anclada en el marco metodológico freiriano. Realizado con cuidadores familiares y profesionales de atención primaria. Para analizar la concordancia entre examinadores se calculó el Índice de Validez de Contenido. **Resultados:** Participaron 16 cuidadores y 10 profesionales de la salud. El principal incumplimiento encontrado fue la falta de conocimiento sobre la prevención de lesiones por presión. La acción educativa permitió el intercambio de conocimientos entre los sujetos que construyeron, implementaron y evaluaron dos tecnologías educativas: una cartilla de prevención de lesiones por presión y un disco de reposicionamiento. El cuadernillo, además de ser evaluado por los cuidadores, fue validado en su contenido por jueces expertos. **Conclusión:** Se entiende que es necesario reconocer las necesidades de salud de las poblaciones y, a partir de ellas, proponer estrategias de atención congruentes con la realidad real de los sujetos y sus familias. La dialogicidad permitió la construcción de tecnologías educativas relevantes en el contexto de la educación en salud para calificar a los cuidadores familiares.
Palabras clave: Salud del Anciano; Tecnología Educacional; Cuidadores; Educación en Salud; Úlcera por Presión.

RESUMO
Objetivo: Descrever o processo de construção de tecnologias educacionais para a prevenção e tratamento da lesão por pressão, a partir das necessidades do cuidador familiar. **Método:** Pesquisa-ação participativa, dividida em fase exploratória, principal e de avaliação, ancorada no referencial metodológico freiriano. Realizada com cuidadores familiares e profissionais da atenção básica. Para análise da concordância entre examinadores, calculou-se o Índice de Validade de Conteúdo. **Resultados:** Participaram 16 cuidadores e 10 profissionais da saúde. A principal não conformidade encontrada foi o déficit de conhecimento sobre prevenção de lesão por pressão. A ação educativa permitiu a troca de saberes entre os sujeitos que construíram, implementaram e avaliaram duas tecnologias educacionais: uma cartilha de prevenção de lesão por pressão e um disco de reposicionamento. A cartilha, além de ter sido avaliada pelos cuidadores, foi validada quanto ao seu conteúdo por juízes *experts*. **Considerações finais:** Entende-se que é necessário reconhecer as necessidades em saúde das populações e, a partir destas propor estratégias para um cuidado congruente com a realidade dos sujeitos e de suas famílias. A dialogicidade propiciou a construção de tecnologias educacionais relevantes no contexto da educação em saúde para qualificação dos cuidadores familiares.
Palavras-chave: Saúde do Idoso; Tecnologia Educacional; Cuidadores; Educação em Saúde; Úlcera por Pressão.

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INTRODUCTION

The aging process of the population is a global phenomenon marked by numerous social, economic and cultural changes, whose current context points to a panorama characterized by chronic non-communicable conditions that can lead to mobility restrictions in the elderly and cause skin changes, such as pressure injuries (PI)[1-2].

PI is defined as a lesion located in the skin and/or tissues, muscles and bones. It generally results from compression of soft tissue between a bony prominence and an external surface for a prolonged period that has not been relieved, and may be associated with friction and shear or medical-hospital devices. These lesions present several stages, depending on the associated skin and tissue involvement, ranging from a non-blanchable erythema with intact skin (stage 1) to a severe lesion (stage 4), when they affect muscles, bones and cartilage [2].

Its prevalence varies between 16 and 17.4% in patients receiving home care and causes significant emotional, social and financial impact on patients and their families[3]. At home, preventing these lesions presents several challenges, including knowledge about preventive strategies. Many of these lesions can be avoided with appropriate care, which highlights the need for health education activities to support this care[4].

In the home environment, the main people involved with the elderly in skin care and hygiene are family caregivers and, therefore, in order to reduce the incidence of these lesions, they must be equipped with knowledge about skin care and lesion prevention based on scientific evidence. To this end, it is necessary to carry out educational activities that promote a space for dialogue, with guidance on preventive measures and a complete assessment of the elderly's skin, with a focus on prevention and health promotion[4].

This work assumes that health education strategies, as well as Educational Technologies (ETs), can help include and participate caregivers and professionals in developing skills and improving the quality and safety of the care they provide. The construction of ETs in a participatory manner can mediate health education actions and facilitate the relationship between professionals and family caregivers of elderly individuals at risk of PIs, and are contextualized with the concrete reality of those experiencing the situation[5].

Due to these characteristics, ETs contribute to the qualification of professionals and caregivers in various topics, according to the health needs of individuals, families and the population involved. In order to become such, the process of their construction must include the exchange of professional knowledge and practices (technical-scientific knowledge) and popular knowledge (common sense) so that they produce empowerment in the care process[6].

Thus, the importance of ET aimed at family caregivers on safe practices for the prevention of pressure injuries is highlighted, constructed in a formative and problematizing manner, based on the theoretical frameworks of

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Paulo Freire[6]. To this end, the present study was anchored in the following question: Does ET constructed collectively and in a participatory manner by family caregivers and health professionals facilitate the teaching-learning process, in an interactive manner, on the prevention of pressure injuries in elderly people at home?

To answer this question, the research aimed to describe the process of constructing educational technologies for the prevention and treatment of pressure injuries, based on the needs of the family caregiver.

METHODOLOGY

This is an action research with a qualitative approach, developed in the following way: exploratory phase, planning and action phase and action evaluation phase[7]. The development of the educational meetings, as well as the justification for the participatory construction of ET for caregivers of elderly people at risk of developing PI, were supported by Freire's theoretical framework of problematization[6]. The research had the effective participation of both family caregivers and professionals linked to an area attached to the Family Health Strategy (ESF) team. It is worth noting that the researcher was inserted and immersed in the entire educational and research path and the participants were recognized as protagonists of the entire process[7].

Action research favors the production of problematizing knowledge that culminates in the ability to read reality and act on it, to transform it, in a counter-hegemonic way to scientific knowledge, as the sole criterion of truth. The participation of users aims to value prior knowledge, identify their needs, include them as actors in the process, making them take part and be part of the construction of knowledge, and encourage reflection and awareness[6-7].

In order to meet the framework of action research, which brings together several methods or techniques for data collection, this research was designed. The steps covered in this study are shown in Table 1 below, and occurred between March 2018 and February 2019.

Table 1 – Steps of action research used in this study. Maringá/PR, 2019

Exploratory phase:	**Main phase: planning and action**	**Evaluation phase:**
Identify caregivers of frail elderly individuals at risk of PI; Identify their knowledge and practices, and non-conformities in the prevention and treatment of PI[.]	Discuss and plan (construction, adaptation and implementation of TEs), valuing the integration of knowledge and practices of the participants[.]	Adjust the TEs based on the notes made by the expert judges. Evaluate the path and applicability of the TEs by the participants.

Source: the authors.

The study was conducted in the homes of elderly people/caregivers belonging to a Basic Health Unit (UBS) within the coverage area of an ESF unit in Maringá/PR, Brazil. The choice

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for this setting was due to the fact that an extension project of which the authors were members was being developed at this location, entitled: Nursing Home Care for Families of Elderly People (ADEFI). Thus, the researchers already had a connection with ESF professionals and a previous relationship with elderly people and their caregivers, who had already been served by the aforementioned project. The interest in addressing this topic came from the researcher's previous experience with these services and from verifying the need for the service.

Sixteen caregivers participated in the study, who met the following inclusion criteria: being the main family caregiver of an elderly person at risk of PI. The following criteria were adopted for inclusion of professionals: working at the reference UBS and providing assistance to the elderly.

At the time of data collection, the unit had 14 professionals. Everyone was invited to participate in the study, but only 10 took part in this research. Five were members of the Family Health Team (two community agents, one nurse, one doctor and one nursing technician), and five nursing technicians who worked at the Basic Health Unit.

Finally, after the ET was created, it was evaluated and validated in terms of its appearance and content by a panel of expert judges. These judges were chosen based on their academic qualifications, time since graduation, time working in the area, participation in research groups/projects and scientific production[8].

Data collection included different instruments, which allowed for data triangulation and scientific rigor. The first stage of the action research, the exploratory phase, was aimed at understanding the research field and characterizing caregivers of elderly individuals at risk of PI for inclusion/exclusion in the study.

In the exploratory phase, the knowledge and practices of caregivers were surveyed using two instruments: 1) a script for observing home visits to frail elderly individuals, identifying the caregiver, and a checklist for observing the care provided to the elderly individual; 2) an instrument administered at home to family caregivers of frail elderly individuals, after prior scheduling, consisting of 35 questions divided into the categories of assessment and classification, risk factors, and prevention of PI[8].

In the planning and intentional action stage, two TEs were created: a guidebook for prevention and management of PI and a disk for guidance on body repositioning, developed with the participation of family caregivers and professionals. This stage consisted of the following phases: a) theoretical basis and systematization of content, in which the nonconformities in the knowledge and practices of family caregivers of elderly individuals were organized, for which emancipatory proposals for resolution would be triggered; b) selection of ET illustrations, for which an album was created with images from the Web and from the

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researchers' personal archives, so that participants could choose images that represented the educational content for them; c) organization and composition of the content, which was carried out according to the educational needs and expectations of the participants; d) validation of the booklet by experts; e) evaluation of the booklet again by family caregivers[6,9].

In addition to being constructed collectively by the authors, professionals and caregivers, the ET was jointly assessed by the target audience, as well as by expert judges, regarding its content. The educational content assessment stage was carried out throughout the ET construction process with the caregivers individually, at home, and through meetings at the UBS with the professionals.

To guide the judges' evaluation process, an instrument aimed at validating printed educational materials was used and applied, consisting of 30 essay questions about the following domains: validation of the material's content (scientific accuracy and content); appearance of the material (literary presentation; illustrations; sufficiently specific and comprehensive material); readability and printing characteristics; quality of information[9].

The score was calculated by adding the agreement of the items that were marked as "3" or "4" by the judges. The Content Validity Index (CVI) was verified, an instrument that measures the proportion of judges who agree on a given aspect of the instrument and its items, whose value must be greater than or equal to 0.78. In the analysis of the data judged by the judges, items with a minimum agreement level of 75% in positive responses were considered adequate. Items with an agreement index of less than 75% were considered worthy of change. The components that received a score of "1" or "2" were revised or eliminated, and the participants were asked to describe the reason why this option was considered. The changes suggested by the judges were made until consensus was reached[10].

After validation by the judges, the booklet was sent back to the caregivers for review of the final version. The suggestions and opinions of the caregivers and participating professionals were incorporated into the TEs throughout their development process, during home visits and discussions. The body position guidance disk was adjusted only by the caregivers.

The variables were organized descriptively. The results of the questionnaire on the knowledge and practices of family caregivers were considered adequate when they obtained ≥ 90% correct answers in each question[8].

Based on the data from the home visit observation script, with observation of the actions and knowledge of family caregivers and data from the medical records, the nonconformities (knowledge and practices that disagreed with what is recommended in the literature)2 were listed, for which there were emancipatory dialogues[6] that culminated in the creation of the TEs.

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This research is part of a macroproject approved by the Human Research Ethics Committee of the State University of Maringá, under opinion CAAE no. 37457414.6.0000.0104. The study complied with all ethical requirements regulating research involving human beings. Participation in the research was voluntary and only effective after clarification, agreement and signing of the Free and Informed Consent Form (FICF), in two copies.

RESULTS

Among the family caregivers, 14 (87.5%) were female and two (12.5%) were male. Regarding the kinship of the female caregivers of the elderly, 10 (71.4%) were daughters; three (21.4%) were wives; and one (7.1%) was a sister. As for the male caregivers, two were sons of the elderly. The majority of female caregivers were in the 51 to 60 age group, with eight (57.2%), followed by three (21.4%) in the 61 to 70 age group. Three (21.4%) women were in the under 50 age group. Among the men, two were in the under 50 age group.

Among the seven expert judges, there was one physician, one physiotherapist and five nurses. The average age of the judges was 37 years, ranging from 26 to 61 years; six were female and one was male. Regarding the time since graduation: three (42.8%) had graduated between 6-10 years ago; two (28.6%) had graduated between 11-20 years ago; and two (28.6%) had graduated for more than 21 years. Regarding qualifications, four (57.1%) had PhDs, two had experience and participation in a research group and specialization in skin lesions, and one judge had expertise in TE assessment with a research group and publications in the area of TE in health; another judge had expertise in the area of elderly health with a research group and publications in the area; two (28.6%) had residency in the area of PHC and experience in professional care for the elderly; and one (14.3%) specialized in the area of elderly health. Among the judges, four (57.1%) were teachers and three (42.8%) worked in healthcare. Regarding the knowledge and practices of family caregivers regarding the assessment and classification of PI, of the seven questions related to the assessment and classification of these injuries, the respondents presented adequate knowledge in only one item (14.3%). It was also found that of the 28 questions regarding the risk factors and prevention of PI, present in the aforementioned instrument, in only 11 (39.3%) of them the caregivers presented adequate knowledge[8]. The caregivers mentioned repositioning in bed as a preventive action, however, they did not know how to perform this procedure and how often it should be done[2,11]. The lowest rates of correct answers in the instrument applied to the caregivers were about the time needed to reposition elderly people restricted to bed and wheelchair; performing massage on bony prominences and reddened areas; about the use of water or air gloves in the heel region to prevent PI; on the classification of

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PI and risk factors such as friction and humidity in the onset of PI[2,11].

The following potentialities were identified in the knowledge and practices of caregivers: performing skin hygiene after elimination, frequent diaper changes, skin hydration, offering adequate nutrition and oral or enteral hydration, and encouraging movement, when possible. These precautions are present in consensus documents on care related to PI[2,11-12].

The main nonconformities observed during home visits were about the lack of knowledge about PI prevention. Among the topics that most needed to be discussed were: PI concept and its classification; location of the body regions most vulnerable to PI; identification of PI risk factors; PI prevention strategies; adequate positioning and transfer techniques for elderly individuals with reduced mobility.

In the second stage, in the planning phase, priority TEs were constructed to resolve the nonconformities identified. The booklet was composed of the following themes, listed together with the team of professionals from the UBS and the caregivers: the role of the family caregiver; concept of PI, its stages and evolution; risk factors (immobility, lack of activity, lowering of the level of consciousness or mental changes, skin moisture, poor diet, friction and shear); preventive measures for PI; techniques for moving the elderly and body mechanics.

To select the illustrations, an album was created with photos of LPs, illustrating their formation, stages, risk factors and how caregivers can contribute to their prevention. During home visits, illustrations relevant to the content of the booklet were chosen. In the composition of the content, the specialized literature was searched for existing scientific knowledge[2] on the subject and it was decided to use words familiar to caregivers, easy to read and understand.

A disk (Figure 1) was also created to guide repositioning in bed, at the request of caregivers, as an extension of the booklet. Although this disk was chosen to adopt a frequency for repositioning, the importance of performing frequent skin assessments and performing this procedure according to the individual's needs was emphasized[2,13].

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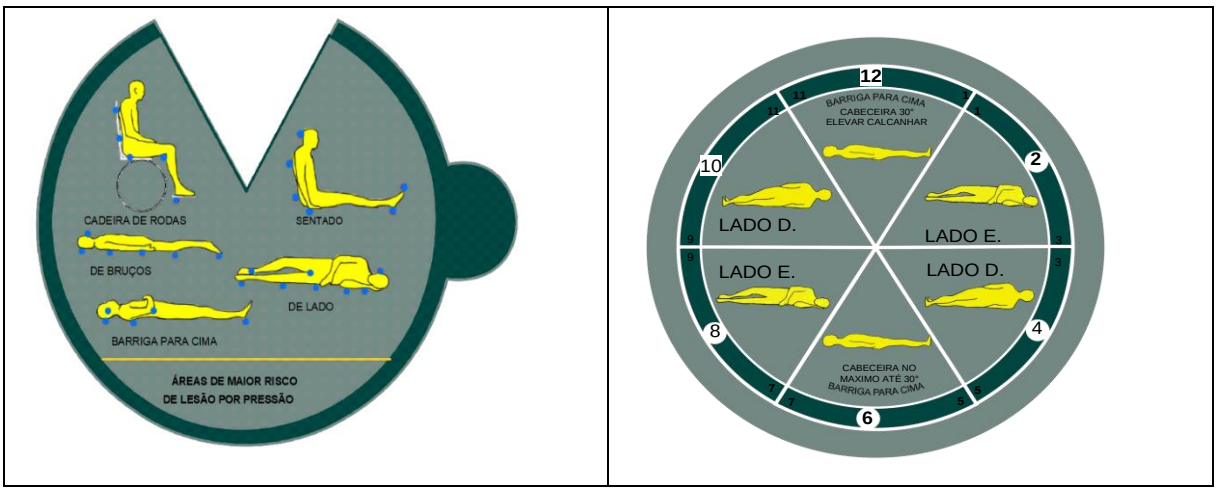
Figure 1 - Positioning guidance disk. Maringá/PR, 2019



Source: the authors, 2019.

Initially, the disc would have information on the back about preventing PI, but the content written on the back was removed and the caregivers preferred to place it on the wall, near the bed, to remind them of the need to change position.

During the evaluation phase, the booklet was validated by the judges. It was found that the Content Validity Index ranged from 0.86 to 1.0 and was considered adequate[10]. Regarding the evaluation of appearance by the judges, the 30 items evaluated obtained an agreement greater than 85.7%. No item received a score of "2" (item that needed major revision to be representative) or "1" (not relevant or not representative).

Even for items marked as "3" or "4", the judges made suggestions for improving the booklet (appearance and addition of information), in addition to changes in technical terms: changing the cover illustration, changing the font color, changing the font of the titles and subtitles, reducing the size of the booklet (two judges); adding a summary to be posted on the wall, changing the title of the booklet, replacing abbreviated names with full names, inserting the source of the images, indexing the booklet with the postgraduate program.

The changes made to the booklet, based on the judges' suggestions and the consent of the study participants, were: changing terms such as "flex" to "bend"; "prominences" to "protuberances"; "nutrition" to "feeding"; the term "live flesh" was chosen to describe stage 2 LP (superficial wound with exposure of the dermis); the term "bronchoaspirate" was replaced by "choke" and "food goes to the lungs"; "dorsal decubitus" was changed to "lying on your back or belly up".

After the modifications to the booklet, it was re-evaluated by the judges in relation to its form and content. The title on the cover was changed from "Care for the elderly in the prevention of PI" to "Family care for the elderly at risk of Pressure Injury". There were also changes in technical terms and grammar, based on the judges' contributions, which made the educational material more accessible and

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understandable for caregivers and professionals who will use the booklet.

The caregivers positively evaluated the active participation in the construction and use of the ET, and believed that the educational material could contribute to other caregivers and facilitate the team's work in providing guidance on the prevention and management of PI.

The booklet and the positioning guidance disk were used by primary care professionals, nurses, physician, physiotherapist, CHA and the researcher. The implementation of the intervention aimed to discuss multidisciplinary care in the prevention and management of PI and to share knowledge about care for pressure injuries with family caregivers. During the process, it was possible to identify the awareness of professionals regarding PI, to the point that they noticed an increase in demands from "people at risk of PI", which may be related to greater attention from professionals to this clientele.

The professionals recognized the role of the multidisciplinary team as being fundamental in the care of PI in the elderly. According to them, the team must act in the prevention of PI and offer support to the elderly and their families, as well as guide and prescribe nursing care for PI, coordinate care with the multidisciplinary team, monitor and perform dressings, and also plan, propose and execute a therapeutic plan.

DISCUSSION

Family caregivers are unprepared to provide care for people at risk of PI. This fact is related to the lack of information received upon discharge of the dependent family member from hospital, the caregiver's lack of knowledge on the subject that would allow for risk-free and harm-free care at home, and insufficient support from primary health care (PHC) professionals for the family caregiver, making it difficult to make assertive decisions regarding home care[14-16].

The results of this study corroborate the literature regarding the lack of accessibility and the fragility of therapeutic bonds between health professionals and users[17]. Caregivers did not feel fully supported by professionals, and there was no standardization of conduct related to PI, which makes it difficult to direct the work and record the care performed by the multidisciplinary team[16].

Otherwise, the identification of patients at risk for PI, i.e., confined to bed or with reduced activity and mobility, and of caregivers without adequate knowledge of guidelines on PI preventive measures, denotes a weakness in the care provided, both at home and at secondary and tertiary levels, since these patients have, at some point, undergone a hospitalization process[18-19].

Undoubtedly, one of the main preventive measures for this injury is repositioning in bed. Given the findings of this study, it was found that caregivers were unaware of the recommended frequency for this procedure and

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how it should be performed. There is no consensus in the literature regarding the "ideal" frequency of repositioning; a maximum of every two to three hours is recommended; however, continuous assessment of the patient's skin is recommended to verify the effectiveness of this procedure and the need to increase its frequency. All this information should be passed on to caregivers, whether by PHC professionals or by professionals from hospital institutions[2,13, 18-19].

Another weakness found was the lack of knowledge about the stages of PI. Although it is not the caregiver's responsibility to know the stages of PI, it is important to point out the first stage, in which the skin is still intact with blanchable erythema, so that assertive measures can be taken before the lesion worsens. Caregivers need to be instructed to be vigilant when assessing the skin and observing signs of skin changes[14].

This study found a level of knowledge below expectations regarding body massage as a preventive measure for PI, as well as regarding the use of gloves with water and cushions with a central hole to prevent this lesion. These practices have long been proven not to be recommended and are still performed as preventive measures, including among health professionals. Other studies, carried out with professionals, found similar results, which demonstrates the importance of ongoing education actions with professionals, to prevent non-evidence-based practices from being passed on to the community[20-21].

Since the information contained in the booklet was listed in a participatory manner based on the difficulties and interests of caregivers, the ET was composed of information that was truly important to the target audience, as also found in other contexts[22-23].

The process of constructing educational technology in health seeks to stimulate a critical stance on the part of users, which enables autonomy, inclusion, exchange of knowledge, practices and actions that consider their knowledge about the health problem, as occurred in this process of constructing ETs[24].

The ET based on health education allowed the perception of the risk of PI by caregivers to be reflected in preventive behavior. Printed TEs, such as the booklet and the positioning guide disc, are important tools to be used in the health education process and were used to complement the verbal instructions given by professionals, as a facilitating and auxiliary means to provide knowledge to the population and as a way to standardize the instructions given by health professionals to the elderly and family caregivers, in addition to serving as material for caregivers to consult in their daily lives and to complement information that is often not assimilated[22].

In view of this, the process of systematizing the content of the TEs allowed the content to be reviewed and updated after identifying nonconformities or difficulties presented by caregivers, which were validated and discussed with the participants, resulting in the themes that made up the content of the TEs, in which the preferences of the participants were

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respected, establishing a dialogic and effectively participatory process, with the direct involvement of those directly involved[6].

The analysis by the judges was necessary to verify the adequacy of the TE and its content in relation to the scientific literature. The CVI obtained in the validation phase ranged from 0.86 to 1.0 and was considered adequate, as recommended by the literature[10]. The responses to the instruments related to the appearance of the booklet by the judges obtained an agreement greater than 85.7% and were also considered adequate[10]. Thus, it is understood that the ET can be adopted as a facilitating and mediating instrument of educational processes on this topic.

The participation of the caregivers occurred throughout the educational process, which allowed problematization and contextualization through dialogue and educational action. The construction of the ETs occurred based on the vocabulary of the caregivers and easy-to-understand illustrations, chosen by the target audience, according to the needs presented by the participants in their daily lives. In addition, with the construction of the booklet, we sought to refute the centrality of knowledge, admitting other knowledge and respecting the speech of others[6,22-23].

The judges assessed the material as being a support in the education of family caregivers and emphasized that it is essential for professionals to use updated knowledge for this purpose, to promote the quality and safety of care and to provide continuity of treatment at home, as found in similar studies[18-19].

As strengths of this work, it is possible to list the fact that the construction of the ETs was conducted in a joint and participatory manner with the caregivers, recognizing the role of the caregiver in home care and contributing to the improvement of care and the quality of life of the elderly and their families. Another relevant factor was the participation of specialists in the validation, which helps in the quality of the materials, especially if done by a multidisciplinary team, increasing the objectivity of the phenomenon[24].

A limitation is the small number of participants in the study. Other similar studies can be carried out, in order to seek to verify, in other regions of the country, whether the findings are similar, in order to contribute to health actions aimed at pressure injuries.

FINAL CONSIDERATIONS

This study found that family caregivers of individuals with pressure injuries had weaknesses in their knowledge about the prevention of this condition, as well as its treatment. The weaknesses found were identified as non-conformities or extreme situations, and from these, educational technologies were constructed that allowed greater safety and qualification of family caregivers of elderly individuals regarding the prevention of pressure injuries, through the sharing of knowledge, practices and guidelines.

In addition, the educational activities carried out during the construction of the

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material with family caregivers helped them understand the home care process and create support mechanisms for the problems experienced in their daily lives. The constructed booklet was validated by a panel of judges, where a content validity index of 0.86 to 1.0 was obtained, considering it adequate in terms of its appearance and content.

Educational technologies are relevant in the context of health education for the qualification of family caregivers of elderly individuals, as they allow the appropriation of knowledge, resulting in greater safety in the care process for the prevention and management of pressure injuries.

This study highlights the importance of the participatory construction of educational technologies with family caregivers of elderly people and the advantages of protagonism in the process of knowledge and new practices, refuting the centrality of knowledge. Furthermore, it points out that the nurse, as an educator, needs to know the reality in which the students are situated and consider them participants in their educational process.

REFERENCES

1. Ismail Z, Ahmad WIW, Hamjah SH, Astina IK. The Impact of Population Ageing: A Review. Iran J Public Health 2021;50(12):2451-2460. https://doi.org/10.18502/ijph.v50i12.7927.

2. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Injury Aliance. Prevention and treatment of pressure ulcers: quick reference guide [Internet]. Cambridge Media: Osborne Park; 2019. Available from: https://epuap.org/pu-guideline/

3. Lampersberger LM, Bauer S, Osmancevic S. Prevalence of falls, incontinence, malnutrition, pain, pressure injury and restraints in home care: A narrative review. Health Soc Care Community 2022;30(6):e3656-e3669. doi: https://doi.org/10.1111/hsc.14021.

4. Fernandes AM, Brandão MGSA, Teodoro ML, Vianna PC, Pereira MCA, Nogueira PC, et al. The burden of informal caregivers of people with pressure injuries in-home care. Estima. 2023; 21(e1433):1-9. doi: https://doi.org/10.30886/estima.v21.1433_IN.

5.Teixeira E. Interfaces participativas na pesquisa metodológica para as investigações em enfermagem. Rev. Enferm. UFSM 2019; 9(1):1-3. doi: https://doi.org/10.5902/2179769236334.

6. Freire P. Pedagogia do oprimido. 65ª. ed. São Paulo: Paz e Terra; 2018.

7. Thiollent M. Metodologia da pesquisa-ação. 18ª. ed. São Paulo: Cortez; 2022.

8. Nogueira PC. *et al*. Conhecimento dos cuidadores de indivíduos com lesão medular sobre prevenção de úlcera por pressão. Aquichan 2015; 15(2):188-199. doi: http://dx.doi.org/10.5294/aqui.2015.15.2.3.

9. Castro MS, Pilger D, Fuchs FD, Ferreira MBC. Development and validity of a method for the evaluation of printed education material. Pharmacy Practice. 2007;5(2):89-94. Available from: https://www.pharmacypractice.org/index.php/pp/article/view/259. doi: 10.4321/s1886-36552007000200007.

10. Coluci MZ, Alexandre NM, Milani D. Construção de instrumentos de medida na área da saúde. Ciênc Saúde Coletiva. 2015; 20(3):925-36. doi: https://doi.org/10.1590/1413-81232015203.04332013.

11. Norton L, Parslow N, Johnston D, Ho C, Afalavi A, Mark M, et al. Best practice recommendations for the prevention and

management of pressure injuries. In: Foundations of Best Practice for Skin and Wound Management. A supplement of Wound Care Canada; 2017. Available from: https://www.woundscanada.ca/health-care-professional/publications/dfc-2

12. Munoz N, Posthauer ME, Cereda E, Schols JMGA, Haesler E. The Role of Nutrition for Pressure Injury Prevention and Healing: The 2019 International Clinical Practice Guideline Recommendations. Adv Skin Wound Care. 2020;33(3):123-136. doi: https://doi.org/10.1097/01.ASW.0000653144.90739.ad

13. Gillespie BM, Walker RM, Latimer SL, Thalib L, Whitty JA, McInnes E, Lockwood I, Chaboyer WP. Repositioning for pressure injury prevention in adults: An abridged Cochrane systematic review and meta-analysis. Int J Nurs Stud. 2021; 120:103976. doi: https://doi.org/10.1016/j.ijnurstu.2021.103976.

14. Siddiqui S, Skemp L, Burkhart L. Provider perspectives of community-acquired pressure injury prevention in veterans with spinal cord injury. J Spinal Cord Med. 2024; 47(1):168-180. doi: https://doi.org/10.1080/10790268.2022.2088505.

15. Burkhart L, Skemp L, Siddiqui S. Veteran model of preventing community-acquired pressure injuries associated with spinal cord injury: A qualitative descriptive study. J Spinal Cord Med. 2024;47(1):110-124. doi: https://doi.org/10.1080/10790268.2021.1982177

16. Zanini C, Lustenberger N, Essig S, Gemperli A, Brach M, Stucki G, Rubinelli S, Scheel-Sailer A. Outpatient and community care for preventing pressure injuries in spinal cord injury. A qualitative study of service users' and providers' experience. Spinal Cord. 2020; 58(8):882-891. doi: https://doi.org/10.1038/s41393-020-0444-4

17. Sousa MF, Santos BM, Paz EP, Alvarenga JP. Complexidade das Práticas da Enfermagem na Atenção Primária à Saúde. Enferm Foco 2021; 12(Supl.1):55-60. doi: https://doi.org/10.21675/2357-707X.2021.v12.n7Supl.1.5211

18. Silva YC, Silva KL, Velloso ISC. Practices used by a home care team: implications for caregivers. Rev Bras Enfermagem. 2021;74(2):e20190794. doi: https://doi.org/10.1590/0034-7167-2019-0794

19. Santos DJ, Limeira FNO, Alves VBO. Percepção do cuidador diante da lesão por pressão de pacientes atendidos na atenção domiciliar. Rev. Enferm. Atual In Derme. 2022;96(37):e-021196. Available from: https://www.teste.revistaenfermagematual.com/index.php/revista/article/view/1281

20. Sousa RC, Faustino AM. Conhecimento de enfermeiros sobre prevenção e cuidados de lesão por pressão. Rev Fun Care Online. 2019;11(4):992-997. doi: http://dx.doi.org/10.9789/2175-5361.2019.v11i4.992-997.

21. Sokem JAS, Watanabe EAMT, Ferreira AM, Siqueira LDC, Coelho MMF, Bergamaschi FPR. Conhecimento da equipe de enfermagem sobre a lesão por pressão. Estima, Braz. J. Enterostomal Ther., 2021; 19: e2521. doi: https://doi.org/10.30886/ estima.v19.1129_PT

22. Carvalho DS, Silva AGI, Ferreira SEM, Braga LC. Elaboration of an educational technology for ostomized patients: peristomal skin care. Rev Bras Enferm. 2019; 447-54. doi: http://dx.doi.org/10.1590/0034-7167-2016-0024

23. Costa CC, Gomes LFS, Teles LMR, Mendes IC, Oriá MOB, Damascen AKC. Construção e validação de uma tecnologia educacional para prevenção da sífilis congênita. Acta paul enferm. 2020; 33:eAPE20190028. doi: https://doi.org/10.37689/acta-ape/2020AO00286

24. Gigante VCG, Oliveira RC, Ferreira DS, Teixeira E, Monteiro WF, Martins ALO, et al. Construção e validação de tecnologia educacional sobre consumo de álcool entre universitários. Cogitare Enferm. 2021; 26:e71208. doi: https://doi.org/10.5380/ce.v26i0.71208

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