



Training home caregivers in pressure ulcer prevention: simulation-based education

Capacitação de cuidadores domiciliares para a prevenção de lesões por pressão: ensino baseado em simulação

Capacitación de cuidadores a domicilio para la prevención de úlceras por presión: enseñanza basada en la simulación

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ABSTRACT

Objective: to understand the role of simulation-based training in preparing home caregivers for the prevention of pressure injuries during the transition of care. **Method:** a qualitative, descriptive, and exploratory study grounded in meaningful learning. The study was conducted at a large university hospital in a capital city in Brazil's Midwest region between August and November 2024, involving family caregivers of bedridden adult patients at risk of pressure injuries. Participants underwent practical training through simulation during hospitalization. After hospital discharge, semi-structured interviews were conducted at the participants' homes. The data were subjected to Thematic Content Analysis. **Results:** 17 caregivers of 14 patients participated in the study. The interviews revealed three analytical categories: 1) The impact of simulation-based training on caregiver autonomy and safety; 2) Simulation-based training as a pedagogical strategy for skill development; 3) Practical training and pressure injury prevention. **Final considerations and implications for the practice:** the findings showed that simulation-based healthcare education promotes autonomy, safety, and technical proficiency among caregivers, serving as a tool that facilitates the transition from hospital to home and helps prevent complications.

Keywords: Caregivers; Deinstitutionalization; Nursing; Simulation Training; Pressure Ulcers.

RESUMO

Objetivo: compreender a contribuição do ensino baseado em simulação na capacitação de cuidadores domiciliares para a prevenção de lesão por pressão durante a transição do cuidado. **Método:** estudo qualitativo, descritivo e exploratório, fundamentado na aprendizagem significativa. O estudo foi realizado em um hospital universitário de grande porte de uma capital da Região Centro-Oeste do Brasil, entre agosto e novembro de 2024, com cuidadores familiares de pacientes adultos acamados, com risco de lesão por pressão. Os participantes foram submetidos à capacitação prática por meio de simulação durante a internação. Após a alta hospitalar, foram realizadas entrevistas semiestruturadas no domicílio dos participantes. Os dados foram submetidos à Análise de Conteúdo Temática. **Resultados:** participaram do estudo 17 cuidadores de 14 pacientes. As entrevistas revelaram três categorias analíticas: 1) Impactos do ensino baseado em simulação na autonomia e segurança do cuidador; 2) O ensino baseado em simulação como estratégia pedagógica de capacitação; 3) Capacitação prática e prevenção de lesão por pressão. **Considerações finais e implicações para a prática:** os achados evidenciaram que o ensino baseado em simulação em saúde favorece a autonomia, a segurança e o domínio técnico dos cuidadores, configurando-se como um recurso que favorece a transição hospital-domicílio e a prevenção de complicações.

Palavras-chave: Cuidadores; Desinstitucionalização; Enfermagem; Treinamento por Simulação; Úlcera por Pressão.

RESUMEN

Objetivo: comprender la contribución de la enseñanza basada en la simulación a la capacitación de los cuidadores a domicilio para la prevención de úlceras por presión durante la transición de la atención. **Método:** Estudio cualitativo, descriptivo y exploratorio, basado en el aprendizaje significativo. El estudio se llevó a cabo en un gran hospital universitario de una capital de la región centro-oeste de Brasil, entre agosto y noviembre de 2024, con familiares cuidadores de pacientes adultos encamados con riesgo de úlceras por presión. Los participantes recibieron capacitación práctica mediante simulación durante la hospitalización. Tras el alta hospitalaria, se realizaron entrevistas semiestructuradas en el domicilio de los participantes. Los datos se sometieron a un Análisis de Contenido Temático. **Resultados:** En el estudio participaron 17 cuidadores de 14 pacientes. Las entrevistas revelaron tres categorías analíticas: 1) Impactos de la enseñanza basada en la simulación en la autonomía y la seguridad del cuidador; 2) La enseñanza basada en la simulación como estrategia pedagógica de capacitación; 3) Capacitación práctica y prevención de úlceras por presión. **Consideraciones finales e implicaciones para la práctica:** los resultados pusieron de manifiesto que la enseñanza basada en la simulación en el ámbito de la salud favorece la autonomía, la seguridad y el dominio técnico de los cuidadores, lo que la convierte en un recurso que facilita la transición del hospital al hogar y la prevención de complicaciones.

Palabras clave: Cuidadores; Desinstitucionalización; Enfermería; Formación mediante simulación; Úlcera por presión.

INTRODUCTION

Epidemiological transformations, associated with increased life expectancy and the prevalence of chronic diseases, impose additional challenges on the Brazilian health system, which is already overburdened.¹

It is therefore essential to invest in care models that ensure quality, safety, and efficiency in care, while enabling cost rationalization and the reorganization of services to adequately meet new demands.²

In this context, healthcare in Brazil is still marked by the hospital-centric and biomedical model, characterized by fragmented care, the medicalization of life, and the excessive institutionalization of patients, resulting in unnecessary hospitalizations and discontinuity of care, hindering home care.³

The transition of care (hospital-home) is a crucial step to ensure continuity and safety of care. Hospital discharge should be planned in a structured way, with effective communication between the service, the team, the patient, and the caregiver, well-established workflows, and the active participation of family members and other members of the user's care network, to ensure adequate preparation for home care. Weaknesses in this process can compromise the quality of care and favor complications and readmissions.⁴

The active involvement of the team in the care process and in hospital discharge planning favors a more humanized transition, in which the family context is considered and the strengthening of home care is promoted in the face of chronic health conditions.⁵

In this sense, it becomes essential that educational activities are planned and executed continuously, encompassing both the development of self-care by patients and the training of family members or caregivers, to prevent complications. The caregiver – who may or may not be a family member – needs to receive specific training, based on the patient's real needs. Thus, early training, initiated during hospitalization, combined with health education practices, can increase the caregiver's autonomy and competence in home care.⁶

In this scenario of seeking more meaningful learning, simulation-based teaching emerges as a relevant pedagogical strategy in health education. By enabling, in a safe environment, the experience of situations close to reality, simulation favors learning, practice, and evaluation of conduct. This methodology contributes to the development of cognitive, technical, and attitudinal skills, addressing different dimensions of care. Moreover, it allows the caregiver to understand that the act of caring is not innate, but can be learned. Thus, simulation-based teaching prepares the caregiver to handle various scenarios and incidents in which their role is critical, even though they are often still insufficiently prepared.^{6,7}

Pressure Injury (PI) is one of the main complications in chronic patients, both in health services and at home, especially given the increasing number of dependent individuals under family responsibility. Its occurrence is associated with prolonged pressure, shear forces, and clinical factors such as comorbidities and nutritional status.⁸

Given the growing number of patients with chronic health conditions, with a high risk of developing PI in the hospital environment, it is necessary to adopt teaching strategies that are adapted to the reality of family care. In this sense, caregiver preparation should occur during hospitalization to promote safe discharge and continuity of care at home. Thus, the objective was to understand the contribution of simulation-based learning in training home caregivers for the PI prevention during the transition of care, and the study was conducted using the following guiding question: "Does simulation-based learning contribute to the training of home caregivers in the PI prevention during the transition of care?"

METHOD

This is a qualitative, descriptive, and exploratory study with a theoretical-methodological perspective of Content Analysis, in the Thematic modality, based on meaningful learning. The guidelines of the Consolidated Criteria for Reporting Qualitative Research (COREQ) guided the construction and the results.

The study was conducted in the Internal Medicine ward of a University Hospital in the Central-West region of Brazil, with caregivers of hospitalized chronic patients who were bedridden, highly dependent, and at risk of PI, as measured by the Braden Scale and recorded in medical records.

The research was developed in sequential stages: 1) Recruitment; 2) Training; 3) Post-discharge follow-up.

In Stage 1, participants were selected by convenience sampling between August and November 2024. Caregivers were invited to their bedside, with a presentation of the research objectives, application of the sociodemographic data form for both the patient and the caregiver, and scheduling of training according to the availability of both, after signing the Free and Informed Consent Term (FICT). Information was collected regarding age, sex, education, income, International Classification of Diseases (ICD) code, identification of the primary caregiver, length of hospital stay, comorbidities at discharge, and Braden Scale score.

Primary caregivers of patients indicated for home care in the AD2 and AD3 modalities of the Home Care Service criteria were included.⁹ Modality AD2 is intended for patients with clinical conditions who have difficulty or are unable to travel to health services and who require more frequent care, continuous monitoring, and the use of care resources that exceed the capacity of Primary Health Care (PHC). These patients may require systematic monitoring and multidisciplinary interventions at home. Modality AD3 includes patients with a clinical profile similar to AD2, but with greater care complexity, characterized by the need for specific equipment and assistive technologies, such as life support devices or continuous monitoring, which requires intensive care and greater coordination between the services of the Health Care Network (HCN). Caregivers with communication difficulties, hearing impairment, or residing outside the municipality were excluded.

In Stage 2, caregivers were referred, as scheduled, to the institution's Skills Training Center, where they participated in skills

training. The training was conducted by the principal investigator, a nurse with clinical experience in the care of chronically ill patients and previously calibrated to perform the procedures. The environment was structured as a prototype of the home setting, allowing for experimentation, repetition, and correction of procedures. The strategy used was simulation-based teaching, focusing on practical and repetitive training of technical skills for preventing PI at home.

To conduct the training, a structured checklist was developed, consisting of 38 items distributed across five domains related to PI prevention: 1) environmental control, 2) skin care, 3) mobilization, 4) intimate hygiene, and 5) skin hydration. This instrument was developed based on the main scientific evidence related to skin care and was validated by a group of specialist nurses with experience in caring for patients at risk of skin lesions.

The instrument was used during training to assess caregivers' performance in executing the proposed skills. Each item was evaluated using a three-point ordinal scale ("performs", "partially performs", and "does not perform"). The training was conducted individually, allowing for repetition of procedures until the caregiver achieved approximately 90% satisfactory performance on the checklist. The average training duration was 50 minutes. The researcher had no direct care relationship with the participants, acting exclusively for this research.

Stage 3 involved monitoring hospital discharge through the institutional system and, after 30 days, contacting participants by

phone to schedule a home visit and conduct the interview. The individual semi-structured interviews took place in the participants' homes, lasting an average of 30 minutes, and were audio-recorded with their consent. They were conducted by an independent male researcher with prior experience in qualitative health research and who was properly trained to conduct semi-structured interviews.

The summary of the training intervention is presented in Figure 1, developed based on the domains of the structured checklist used to conduct and evaluate the training, to facilitate the replicability of the intervention in other healthcare settings.

The interviewer did not participate in the training phase and had no prior relationship with the participants before the study began, seeking to minimize possible social desirability biases. There were no repeated interviews. When family members were present in the home environment, they did not interfere in the conduct of the interview. Field notes were taken to record contextual observations.

The recordings were transcribed in full using the Reshape® tool and reviewed by two researchers to check against the audio. Subsequently, the transcripts were returned to the participants for content validation (member checking). Data collection was concluded based on data sufficiency, considering the repetition, density, and consistency of the accounts.¹⁰

For data analysis, pre-analysis was performed through floating reading and immersion in the material. The central ideas were identified and grouped by thematic similarity, resulting in

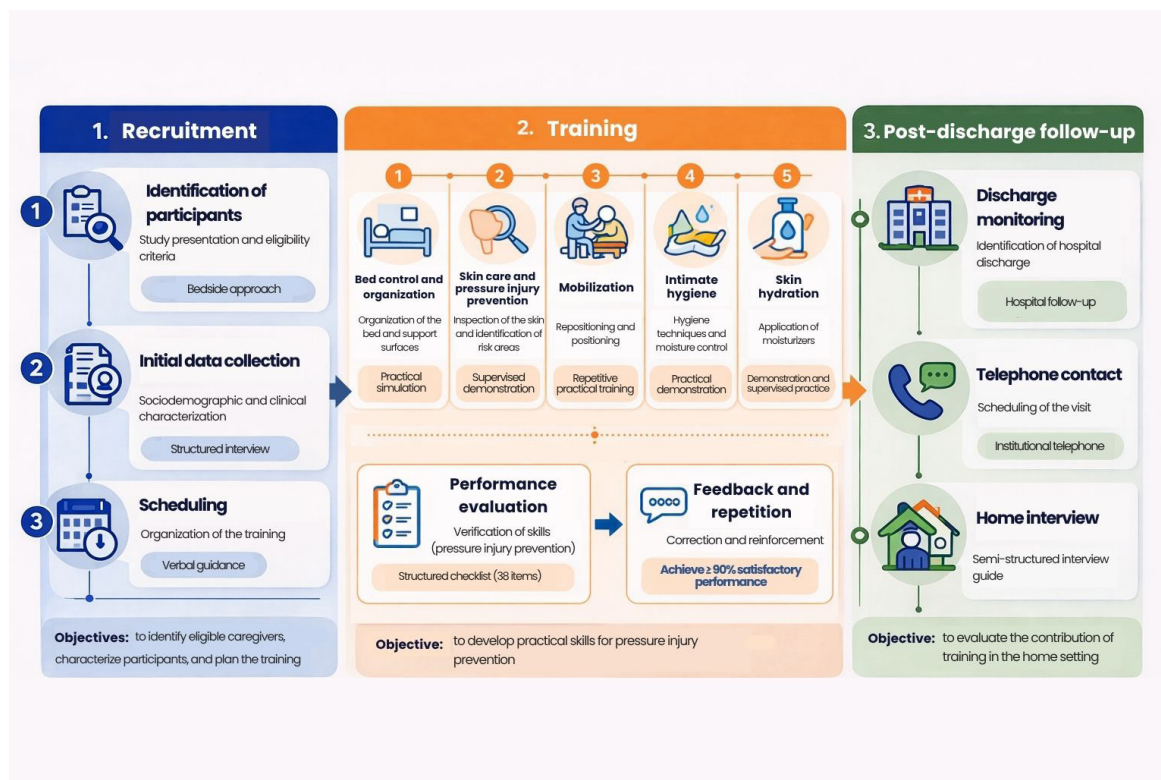


Figure 1. Summary of the simulation-based intervention for PI prevention.

Source: Generated by ChatGPT® (OpenAI) on April 13, 2026.

Core Meanings. Coding was conducted by two independent researchers, previously trained in a pilot test. A codebook was developed with operational definitions, inclusion and exclusion criteria, and illustrative examples.¹¹ Agreement was verified in a subset of the corpus using the percentage of agreement and the Kappa coefficient, adopting $\kappa \geq 0.70$ as an acceptable parameter. Disagreements were resolved by consensus, with the participation of a third researcher when necessary.

Data organization and management were carried out manually, without the use of specific software for qualitative analysis. The codes were grouped until the consolidation of the thematic categories, through triangulation among the researchers, with the results presented with a description of the categories, illustrated by excerpts from the speeches, followed by an interpretation based on the scientific literature.

The study was approved by the Research Ethics Committee (REC) with Human Beings, under opinion CAAE No. 53934521.7.0000.0021, in accordance with Resolution No. 466/2012 of the National Health Council (CNS), which regulates research involving human beings in Brazil.

The authors declare that the ChatGPT® artificial intelligence model (OpenAI, GPT-5.5) was used exclusively as a tool to support spelling review and text improvement of the manuscript, as well as in the creation of Figure 1. All information was subsequently reviewed, verified, and validated by the authors, who assume full scientific responsibility for the published content.

RESULTS

The sample consisted of 14 patients and 17 primary caregivers. The difference between the number of patients and the number of caregivers occurred because some patients had more than one primary caregiver.

Regarding the patients, eight were female, and six were male, aged between 36 and 84 years, with an average age of 68 years, predominantly older adults over 75 years old. As for marital status, eight were married, three were widowed, two were single, and one was divorced. Most patients (11) were retired, two were beneficiaries, and one was a pensioner, with an average income equivalent to one minimum wage and a per capita income of R\$ 1,530.85. Regarding race and color, there was a predominance of whites, followed by mixed-race and blacks. Concerning education, most had only incomplete primary education; the others had education levels ranging from complete primary education, incomplete or complete secondary education, in addition to one semi-illiterate patient. All declared having a religion, with nine being Catholic and five Evangelical. The average length of stay was 46.5 days.

Regarding the main diagnosis (ICD-10), the following were identified: four cases of Cerebrovascular Accident (CVA), two of Acute Myocardial Infarction (AMI), two of Chronic Obstructive Pulmonary Disease (COPD), one of cancer, one of Congestive Heart Failure (CHF), one of Human Immunodeficiency Virus (HIV), one of Amyotrophic Lateral Sclerosis (ALS), one of flaccid paraplegia, and one of osteomyelitis. Among the specialties,

Neurology, Cardiology, Pulmonology, Infectious Diseases, and Internal Medicine stood out. In relation to the Braden scale, six patients presented moderate risk, four presented high risk, and four presented very high risk for PI development. The most prevalent comorbidities were Arterial Hypertension (AH) and Diabetes Mellitus (DM), in addition to one case of epilepsy.

As for the caregivers, of the 17, 14 were women. The age ranged from 21 to 67 years, with an average of 44 years; most caregivers (15) were in the 21 to 59 age range, considered economically active, and only two were over 60 years old. Regarding marital status, eight were married, five were single, two were in a stable union, one was divorced, and one was widowed. In relation to education, there was one semi-illiterate, one with incomplete primary education, five with incomplete secondary education, four with complete secondary education, two with incomplete higher education, three with complete higher education, and one with postgraduate studies. The degree of kinship showed a predominance of close relatives: seven children, three sisters, two grandchildren, in addition to a mother, a son-in-law, a daughter-in-law, a husband, and a friend.

Regarding employment status, only two caregivers were formally employed, and two were students; the others did not engage in work activities, dedicating themselves exclusively to the care of the family member and to household chores.

In relation to the interviews, it was found that the caregivers had a general understanding that PI resulted from problems related to the patient's body mobilization. Among the difficulties, the fact that many were alone in the caregiving stood out, coupled with a lack of knowledge of the proper technique for changing the patient's position and other preventive measures, which meant that these activities were not incorporated into the routine. The qualitative analysis made it possible to identify three categories, which will be presented below:

Category 1: "Impacts of simulation-based education on caregiver autonomy and safety"

In this category, it was observed how the training provided greater confidence and independence for home care. The caregivers' testimonies revealed that simulation-based learning represented a milestone in the learning process, as it gave them autonomy, security, and preparedness to perform caregiving at home. Many reported that, before the training, they felt insecure and unclear about how to act, but after the training, they began to recognize themselves as capable of performing daily caregiving. One caregiver highlighted:

Yes, I feel empowered because I had training in the most important aspects of care, which was very helpful. [...] I'm able to manage my daily routine; the training was very helpful (C3).

In addition to strengthening autonomy, the reports showed that the training enabled the incorporation of the learned techniques

into the care routine, reinforcing confidence in the practices performed. In this sense, another caregiver stated:

It was a new and very pleasant experience, as this training makes you take the correct actions with the patient who is in a more debilitated state. I learned a lot about how to change my grandfather's position and look at his skin when giving him a bed bath (C13).

Simulation-based teaching was also recognized as a facilitator of learning, allowing doubts to be resolved clearly and practically. One participant reported:

The training helped me clear up many doubts I had regarding how to provide care at home, and without it, it would have been more difficult to help my grandmother. I believe it is extremely helpful for people to be able to assist their family members during these fragile times (C17).

Overall, the reports showed that simulation-based teaching not only broadened knowledge but also brought confidence, clarity, and motivation to cope with home care, establishing itself as an essential pedagogical strategy for preparing caregivers of chronically ill patients.

Category 2: “Simulation-based teaching as a pedagogical strategy for training”

This category emphasizes simulation-based teaching as an innovative teaching-learning resource, facilitating practice with the patient and applicable to the context of hospital discharge with caregivers.

Simulation-based teaching was recognized as a pedagogical strategy that contributed to the learning of this population, as it enabled learning in a practical, safe, and meaningful way. The training was perceived as a facilitating resource, capable of transforming the experience into learning applicable to the context of home care. One of the reports highlighted:

The training helped as a facilitator, because you learn, in the correct way, how to handle the patient. It was a new, innovative, and very effective experience for me (C11).

In addition to providing reassurance, the strategy helps clarify doubts and guide patient care. One caregiver reported:

She taught me all the necessary precautions I had to take with my father, I think it was easier to learn that way (C2).

It was very important to learn as if I were dealing with the person in real life. [...] I highly recommend the training,

because it was very important to learn to walk alone, without the help of a professional (C3).

The pedagogical nature of simulation-based teaching was highlighted when compared to other training methods, such as primers and workbooks, which were considered insufficient to prepare caregivers for the practice of caregiving. One of them observed:

Unlike picking up a manual, this isn't something based on a textbook. I think everyone who has a bedridden family member should have this training, explaining it in practice (C12).

Thus, simulation-based teaching was understood as a transformative educational strategy that not only transmitted knowledge but also enabled caregivers to feel more prepared and confident for the hospital discharge process and for home care.

Category 3: “Practical training and PI prevention”

Another dimension highlighted in the reports was the impact of simulation-based teaching on PI prevention. Caregivers emphasized that the training allowed them to develop technical skills, such as changing position, correct positioning in bed, using cushions, and inspecting the skin. One caregiver reported:

This type of training is very good, it helps a lot because, throughout the strategy, it talked about how to take care of my mother, how to bathe her, always checking to see if there are any wounds on her skin, red spots [...]. So, this is very important, really very good, I highly recommend the training (C7).

Other participants reinforced that they learned how to apply preventive measures practically:

In training, we used the pillow, we used the cushions, [...] the heel was never resting on the mattress. We would roll it up with the blanket or sheet and raise his heel (C9).

The strategy helped a lot in terms of taking proper care of the patient, such as taking care of his skin, checking for wounds during bathing, and how to change my grandfather's side, using the pillows where there is bone to avoid causing wounds (C1).

Simulation-based learning also guided caregivers on basic hygiene practices and the use of appropriate products, as illustrated by the following testimonials:

On the skin, I apply moisturizer [...]. I do intimate hygiene, everything is fine, properly, I never leave her wet with urine (C4).

She explained it to me perfectly, so I was able to adapt better when looking at the skin. [...] You have to look at the skin during bath time, checking if it's not a different color and if there are any sores. I think the training is very good (C5).

The testimonies revealed that the training strengthened preventive practices and provided confidence in identifying early signs of injury, promoting safer and higher quality patient care.

DISCUSSION

The patient characteristics revealed a profile of high clinical and social vulnerability. The average age was 68 years, with a predominance of older adults over 75 years of age, an age group associated with the highest risk of functional dependence and complications after long hospital stays. The diversity of marital status, including patients who live alone, reinforces additional challenges for home care, especially in the post-hospital discharge period.¹²

In the socioeconomic field, low education and limited income were observed, factors that can hinder the understanding of health guidelines and the maintenance of adequate care at home, increasing vulnerability after hospital discharge.¹³ From a clinical point of view, diagnoses such as CVA, AMI, COPD, and CHF prevailed, in addition to comorbidities such as AH and DM, associated with greater functional dependence. The average length of stay, of 46.5 days, represents an additional risk factor for loss of autonomy and readmissions.

The Braden Scale assessment indicated a risk of PI in all patients, reinforcing the need for preventive strategies and caregiver training for continuity of care at home, reduction of family burden, and greater patient safety.¹⁴

Regarding caregivers, the data showed the feminization of care, with a predominance of women of working age, frequently absent from work to assume family care, with a direct impact on household income.¹⁵ The low educational level observed in some of the participants also constitutes a barrier to understanding the guidelines and to the safe execution of care.

In this context, the results indicated that simulation-based teaching contributed to the development of caregiver autonomy and safety, favoring the practical application of skills at home. The simulated experience allowed for the active construction of knowledge, increasing confidence in performing activities and reducing insecurity in home care. These findings corroborate the literature, which points to simulation as a teaching strategy capable of promoting the acquisition of technical and attitudinal skills in a safe environment.¹⁶

Another relevant aspect was the sharing of learning among family members, expanding the reach of training and contributing to the reduction of individual burden. This result reinforces the importance of health education as a strategy to strengthen the support network and improve home care.¹⁷

However, barriers were identified, such as the limited time allocated to training, considered insufficient to address all questions, as well as the absence of structured training programs during hospitalization, which may compromise a safe transition to home.¹⁸ These findings highlight the need to expand educational strategies during hospitalization, in line with the guidelines of the National Patient Safety Program, which recommend educational practices aimed at reducing risks in care.¹⁹

Regarding the pedagogical strategy, simulation-based teaching proved to be an innovative resource for caregiver training, providing a controlled learning environment and allowing the repetition of skills without risk to the patient. This approach favors the acquisition of technical, cognitive, and attitudinal skills, in addition to contributing to the emotional security of caregivers in the face of the transition to home care.^{20,21}

Recent studies reinforce the value of simulation-based teaching in preparing for hospital discharge, demonstrating that structured training programs favored continuity of care and increased caregivers' confidence in performing procedures.⁶ Furthermore, practical experience contributes to reducing fear and insecurity, frequently reported by caregivers, promoting greater autonomy in home care.¹⁵

Despite the benefits, challenges persisted, such as the limitation of the absolute realism of the mannequin compared to real care, which can impact the transfer of skills to the home environment. Still, simulation-based teaching proved to be a relevant tool to strengthen educational practice and promote safety in the transition of care. In this study, simulation-based teaching enabled the development of skills related to mobilization, repositioning, skin inspection, and the use of pressure relief devices, contributing to greater safety in home care. Furthermore, the adoption of preventive practices, such as skin hydration, the use of barrier creams, and the maintenance of an appropriate bed, proved relevant to reducing complications and readmissions.²²

However, some caregivers reported emotional barriers and difficulties in reproducing the techniques at home, highlighting the need to consider social, cultural, and educational aspects in the training process. These findings reinforced the importance of caregiver-centered educational strategies adapted to the home context.²³

FINAL CONSIDERATIONS AND IMPLICATIONS FOR THE PRACTICE

The study showed that simulation-based teaching is a relevant pedagogical strategy for training caregivers of people with chronic conditions and at risk of PI, contributing to strengthening confidence in home care. By providing

practical and realistic experiences, this approach can favor the prevention of complications and promote improvements in patients' quality of life.

In the context of educational strategies aimed at training, simulation-based teaching should complement other pedagogical approaches, such as booklets and videos. These materials have a theoretical-consultative character, which contributes to the conceptual understanding of care and offers support to care guidelines. However, simulation represents the practical, safe, and contextualized materialization of care, allowing the caregiver to experience situations close to reality in a controlled environment. In this way, it represents a unique opportunity to build applied knowledge, favoring the development of skills necessary for providing home care.

This study has limitations that should be considered. The small and convenience sample, composed of participants from a single hospital, limits the generalization of the results. Furthermore, the 30-day home follow-up may not have been sufficient to assess sustained changes in care practices and clinical outcomes for patients.

Despite these limitations, the results showed potential for transferability to similar care settings, especially in services that perform the discharge of chronic patients dependent on home care. The detailed description of the intervention and the study context allows for its adaptation to different care realities, contributing to the strengthening of educational strategies aimed at training home caregivers and preventing PI.

The relevance of incorporating active methodologies from the hospitalization period onwards is highlighted, with the potential for expansion to different regional contexts, contributing to the consolidation of educational practices aimed at promoting qualified and sustainable care for patients and their families. It is recommended that future investigations adopt designs that include quantitative outcome measures, such as injury incidence, readmission rates, and quality of care indicators, as well as prolonged follow-up periods, to assess the sustainability of the intervention's effects over time.

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DATA AVAILABILITY RESEARCH

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CONFLICT OF INTEREST

No conflict of interest.

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