Investigación y Educación en Enfermería

Vol. 43 No. 1, January-April 2025 • ISSNp: 0120-5307 • ISSNe: 2216-0280

UNIVERSIDAD
DE ANTIOQUIA

Investigación y Educación en
Enfermería
Vol. 43 No. 1, January-April 2025 • ISSNp: 0120-5307 • ISSNe: 2216-0280

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Publication date: April 15th 2025
Short title: Invest Educ Enferm.
ISSNp: 0120-5307, **ISSNe:** 2216-0280
Published by: Facultad de Enfermería de la Universidad de Antioquia, Colombia

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Editorial

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DE ANTIOQUIA
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Ethical Challenges in Abortion Decision-Making: Perspectives from Perimenopausal Women's Nursing Care

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Patient-centered care emphasizes patient autonomy and aligning treatment with their values. It integrates patients' and families' experiences into illness management, weighing risks and benefits. Ethical dilemmas arise when a pregnant woman's interests conflict with the fetus's potential life. The four-box approach offers a structured ethical framework, considering medical indications, patient preferences, quality of life, and contextual factors—each crucial to responsible, person-centered care.

Ethical Considerations in Women's Abortion Decisions. Abortion is a complex issue with diverse ethical perspectives. Discussions require empathy, respect for differing views, and an understanding of women's ethical challenges in making such decisions. The debate on abortion centers on a woman's autonomy over her body

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Conflicts of interest: No

How to cite this article: Nguyen TTB, Kao CY, Hsu YY, Resna RW. Ethical Challenges in Abortion Decision-Making: Perspectives from Perimenopausal Women's Nursing Care. Investigación y Educación en Enfermería. 2025; 43(1):e01.

DOI: https://doi.org/10.17533/udea.iee.v43n1e01

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

versus the fetus's right to life, raising ethical challenges in defining personhood and legal protection. Balancing the woman's interests with the potential life of the fetus creates complex ethical dilemmas. Societal norms and regional legal differences shape abortion decisions, complicating ethical decision-making for women. A key concern is the impact on a woman's physical and mental health, requiring informed consent, support, and counseling to address emotional and psychological effects.(1)

Ethical Challenges in Nursing Care for Perimenopausal and Unintended Pregnancies. Perimenopause, characterized by fluctuating hormones, still poses a risk of unintended pregnancy, typically starting in the early 40s but sometimes occurring earlier or later. An unintended pregnancy occurs when a woman does not intend to have more children or when the pregnancy occurs unexpectedly.(2) Nearly 50% of such pregnancies end in abortion,(3) leading to ethical dilemmas for patients and nursing practitioners. Nurses encounter complex ethical issues when caring for pregnant and peri-menopausal women, particularly those with unintended pregnancies. To navigate these challenges, nurses must understand ethical principles and their applications in healthcare. However, applying fundamental principles like autonomy, beneficence, non-maleficence, and justice can complicate ethical decision-making in these situations.

Integrating the Four-Box Approach into Patient-Centered Care for Unintended Pregnancies. Nurses face ethical dilemmas in unintended pregnancies, where the principle of autonomy allows mentally capable women to make their own treatment decisions. Person-centered care and shared decision-making emphasize integrating patient values. Providers must balance well-being (beneficence), harm prevention (nonmaleficence), and fair resource allocation (distributive justice). The four-box approach aids in making informed, morally justified treatment decisions by considering medical indications, patient preferences, quality of life, and contextual factors, ensuring responsible, person-centered care.

Box 1: Medical Indications. Pregnancy symptoms initially misattributed to menopause, such as weight gain, nausea, and breast tenderness, raise concerns about potential complications for perimenopausal women. Given their medical history and age, physicians are cautious about the heightened risks, including life-threatening emergencies. Abortion may provide emotional relief by alleviating stress over unexpected pregnancy and moral conflicts. Still, advanced maternal age also increases the risk of complications like ectopic pregnancy, fetal abnormalities, and gestational diabetes.(4) However, the decision to abort can lead to ongoing emotional and moral struggles for women. It may strain relationships with partners or family members who wish to keep the baby, affecting family dynamics. Evaluating the clinical benefits and risks of abortion options is essential. These include surgical (uterine curettage aspiration) and medical (medications to induce contractions) methods.(5) While surgical evacuation is traditional, medical abortion is a popular noninvasive alternative. A systematic review(5) found pharmaceutical methods generally superior to surgical ones, highlighting the benefits of combination therapy over single interventions. Medical abortion using pills is a non-invasive, at-home option but carries risks such as heavy bleeding, cramping, and incomplete abortion.(6) A study(6) of 26 076 women undergoing medical abortion found that 1.5% had ongoing pregnancies, 10.2% required surgical intervention, and 0.6% needed blood transfusions. Surgical abortion, including aspiration and dilation and curettage, is a quick outpatient procedure with a lower risk of incomplete abortion but increases the risks of infection and injury, especially with advanced gestational age. Factors like older age, a history of cesarean delivery, and inadequate dilation can further heighten the risk of complications.

Box 2: Patient Preferences. The unexpected pregnancy, initially confused with menopause, has created misunderstanding and stress for the women, evident in their emotional reaction to the positive test result. This heightened emotional state may impair cognitive processing. Their age and belief they were in menopause contributed to the initial confusion. The conflict between their moral beliefs against abortion and the recommended medical intervention further complicated their decision-making. A supportive decision-maker, such as a partner, family member, or friend, can significantly influence women's decision-making by providing emotional support and valuable insights. Given differing views on the pregnancy, open communication and shared decision-making are essential.(7) Involving a substitute decision-maker should be based on collaborative discussions that respect the woman's autonomy and prioritize her preferences and values. This emphasizes the need for a comprehensive, patient-centered approach that addresses the situation's medical, emotional, and moral aspects. In the face of unexpected pregnancy and initial confusion, women seek clarity and solutions that address their medical needs while maintaining family harmony and upholding strong moral values against abortion. For advanced-age women, health and family unity are vital priorities. Overall, they aim to make decisions that prioritize health, safety, family harmony, and respect for their beliefs. A patient-centered approach should incorporate these factors to support the decision-making process.

Box 3: Quality of Life. A multifaceted approach, focusing on health and overall well-being, is vital to sustaining or improving a woman's quality of life. This includes regular check-ups for early detection and management of health issues, alongside emotional and mental support through counseling, support groups, and stress reduction strategies to help women navigate the emotional complexities of their situation.(8) Shared decision-making is essential, involving women, their healthcare provider, and possibly their families to understand medical options thoroughly. Respecting women's moral beliefs against abortion fosters trust and supports a patient-centered approach. Involving family, especially partners, can enhance support. Access to reproductive resources and future planning discussions, considering women's age and health, are crucial. Collaboration with a multidisciplinary team ensures personalized care that aligns with women's values and preferences.

Box 4: Contextual Features. Decisions on unintended pregnancy can strain family dynamics. Families often seek a resolution that prioritizes the woman's health while considering the pregnancy. They may expect collaborative decision-making that balances medical advice with the desire to keep the baby. Depending on their agreement with the recommended course of action, women need emotional and practical support from their families, such as transportation, home assistance, and caregiving. Women's moral beliefs against abortion often reflect cultural and religious values, making it essential for nurses to offer culturally competent care.(9) Financial stability and access to specialized healthcare resources also play significant roles in decision-making. A holistic, patient-centered approach incorporating cultural competence, family dynamics, and financial and healthcare considerations is critical. Collaboration among healthcare providers, families, and support services helps women make decisions that align with their values and well-being.

Nursing Implications for Caring

Nurses must offer unbiased care, avoid personal beliefs, and follow professional standards. They should assess a woman's decision-making capacity through clear communication, understanding, appreciation of personal implications, and reasoning. If abortion is refused, providers should consider it a temporary or permanent decision. Open discussions and empathetic support are essential, reassuring women that the procedure can be delayed to address concerns. Follow-up visits should explore options before deadlines, and if abortion is chosen, accurate information and legal access should be provided. Early termination by a qualified practitioner is safe, while delays increase risks. In conclusion, nurses should apply bioethical principles, using the four-box approach, to address the emotional and ethical challenges of caring for perimenopausal women with unintended pregnancies. This ensures patient-centered care by aligning medical indications, patient preferences, quality of life, and contextual features, helping to resolve value conflicts.

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Original Article

Serious game as an educational tool to promote the health of children and adolescents with cancer

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Conflicts of interest: No
Received: October 10, 2024.
Approved: February 28, 2025.

How to cite this article: Biró AVS, Fernandes JAS, Fernandes SMPS, Ribeiro LCS, Almeida GC, Almeida GC. Serious game as an educational tool to promote the health of children and adolescents with cancer. Investigación y Educación en Enfermería. 2025; 43(1):e02.

DOI: https://doi.org/10.17533/udea.iee.v43n1e02

UNIVERSIDAD DE ANTIOQUIA
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Investigación y Educación en Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Serious game as an educational tool to promote the health of children and adolescents with cancer

Abstract

Objective. To develop and evaluate the usability of a serious game as an educational tool for promoting the health of children and adolescents with cancer. **Methods.** The Contextualized Instructional Design (CID) methodology was applied to develop the serious game, structured in five stages: analysis, design, development, implementation, and evaluation. Usability assessment included children and adolescents diagnosed with cancer in a public federal referral hospital in a city in Northeastern Brazil, from April to June 2024. A sociodemographic questionnaire and the System Usability Scale with values ranging from 0 to 100 points were used. **Results.** The serious game, entitled Oncoped: on the health journey, is an educational and playful board game that contains eight personalized Paper Toys, 35 houses, and 100 cards divided into multiple-choice questions about cancers, diagnosis, treatments, and challenges; and cards containing information and care tips. The usability assessment was carried out by 12 hospitalized children and 3 adolescents, who after using the game filled out the information on the scale, resulting in a mean score of 95.16 points. **Conclusion.** *The serious game Oncoped: on the health journey* is a fun and playful educational tool that provides effective and active learning. The educational technology received an excellent usability assessment among the game's target audience. Thus, it was found that the tool is innovative and has good acceptability for teaching and promoting the health of children and adolescents with cancer.

Descriptors: games and toys; educational technology; child; adolescent; neoplasms; health promotion.

Serious game como ferramenta educativa para promoção da saúde de crianças e adolescentes com câncer

Resumo

Objetivo. Desenvolver e avaliar a usabilidade de um *serious game* como ferramenta educativa para a promoção da saúde de crianças e adolescentes com câncer. **Métodos.** Para a construção do *serious game*, foi aplicada a metodologia do Design Instrucional Contextualizado (DIC), estruturada em cinco etapas: análise, design, desenvolvimento, implementação e avaliação. Para a avaliação da usabilidade, incluiu crianças e adolescentes diagnosticados com câncer, em um hospital público federal de referência de uma cidade do Nordeste do Brasil, no período de abril a junho de 2024. Utilizou-se um questionário sociodemográfico e o System Usability Scale com valores de 0 a 100 pontos. **Resultados.** O *serious game* intitulado Oncoped: na jornada da saúde, é um jogo de tabuleiro educativo e lúdico, que contém oito *Paper Toys* personalizados, 35 casas e 100 cartas divididas em perguntas de múltiplas escolhas sobre cânceres, diagnóstico, tratamentos e desafios; e cartas contendo informações e dicas de cuidados. A avaliação de usabilidade foi realizada por 12 crianças e 3 adolescentes hospitalizados, que após utilização do jogo preencheram as informações da escala que resultaram no score médio de 95.16 pontos. **Conclusão.** O *serious game Oncoped: na jornada da saúde* é uma ferramenta de educação lúdica e divertida, que proporciona o aprendizado de forma efetiva e ativa. A tecnologia educativa obteve ótima avaliação de usabilidade entre o público-alvo do jogo. Assim constatou-se a ferramenta é inovadora e possui boa aceitabilidade para o ensino e promoção à saúde de crianças e adolescentes com câncer.

Descritores: jogos e brinquedos; tecnologia educacional; criança; adolescente; neoplasias; promoção da saúde

El juego serio como herramienta educativa para promover la salud de niños y adolescentes con cáncer

Resumen

Objetivo. Desarrollar y evaluar la usabilidad de un juego serio como herramienta educativa para promover la salud de niños y adolescentes con cáncer. **Métodos.** Para construir el serious game se aplicó la metodología de Diseño Instruccional Contextualizado (DIC), estructurada en cinco etapas: análisis, diseño, desarrollo, implementación y evaluación. Para la evaluación de usabilidad se incluyeron niños y adolescentes diagnosticados con cáncer en un hospital público federal de referencia en una ciudad del Nordeste de Brasil, de abril a junio de 2024. Se utilizó un cuestionario sociodemográfico y la Escala de Usabilidad del Sistema con valores de 0 a 100 puntos. **Resultados.** El serious game titulado Oncoped: en el viaje de la salud, es un juego de mesa educativo y lúdico, que contiene ocho Paper Toys personalizados, 35 casas y 100 tarjetas divididas en preguntas de opción múltiple sobre cánceres, diagnóstico, tratamientos y desafíos; y cartas con información y consejos de cuidado. La evaluación de usabilidad fue realizada por 12 niños y 3 adolescentes hospitalizados, quienes luego de utilizar el juego llenaron la información de la escala que arrojó un puntaje promedio de 95.16 puntos. **Conclusión.** *El* serious game *Oncoped: en el viaje de la salud* es una herramienta educativa divertida y lúdica que proporciona aprendizaje de una manera efectiva y activa. La tecnología educativa recibió una excelente calificación de usabilidad entre el público objetivo del juego. De esta forma, se encontró que la herramienta es innovadora y tiene buena aceptabilidad para la enseñanza y promoción de la salud de niños y adolescentes con cáncer.

Descriptores: juegos y juguetes; tecnología educativa; niño; adolescente; neoplasias; promoción de la salud

Introduction

Cancer is a disease characterized by the uncontrolled growth and division of cells, and can present different manifestations and causes. Tumors that affect children and adolescents generally grow faster and are more invasive. They are predominantly of embryonic origin, unlike those that affect adults, which are mostly related to exposure factors and lifestyle(1) According to the National Cancer Institute, childhood cancer in Brazil is the leading cause of death (8% of the total) due to the disease in children and adolescents aged 1 to 19 years.(2) It is estimated that, on mean, 29,000 children under the age of 9 will develop cancer annually in Latin America.(3) However, progress in the treatment of childhood and adolescent cancer over the last four decades has proven to be quite effective, since, after treatment, 80% of patients respond with a cure, when early diagnosis occurs and appropriate treatment is carried out in specialized centers.(2)

However, treatment raises numerous doubts for children and adolescents, especially in the therapeutic process, due to the social, physiological and psychological changes in childhood. Furthermore, it is a situation that generates anxiety, especially when it involves invasive and painful procedures, such as chemotherapy and radiotherapy treatments.(4) During this stage of care, it is essential that there is access to information, so that this public understands the process and, thus, can identify and prevent future discomfort or complications that may arise as a result of the treatment.(5) To help in the understanding of the health-disease process, technological tools have been used, which can contribute to improving care, education, motivation and autonomy. Thus, innovative strategies can encourage changes in lifestyle habits and generate learning from these technologies.(6) The use of educational tools with the objective of promoting health and providing guidance on childhood and adolescent cancers, their treatments, diagnoses and interventions helps to clarify doubts, fill knowledge gaps, induce behavior changes and stimulate decision-making.(7)

Serious games are technological games developed for educational purposes, and not just for entertainment. This technology uses a methodology that enables learning about the disease, so that this knowledge occurs through the dynamics of the game and interaction between participants, in addition to being a playful and fun way. Thus, the patients can enjoy a common tool in their daily lives, such as games, to acquire knowledge about the new situation that was previously unknown.(8) In the health area, several studies have highlighted the importance of using serious games for health care for children and adolescents, such as “Hospital Mirim”, which aims to cope with pain and the context of the invasive blood collection procedure in children,(9) and “FonoConnect”, which aims to be a playful tool for patients, in order to make speech therapy a pleasant and stimulating moment.(10) However, these serious games were developed virtually, and no serious games were found for the purpose of educating children and adolescents with cancer, which demonstrates the relevance of this study.

In this context, the educational process regarding the disease and the treatment process is extremely important to prevent discomfort and complications resulting from this phase of care. To this end, educational games are extremely important as a playful means of offering relevant information through play. Thus, this study aimed to develop and evaluate the usability of a serious game as an educational tool for promoting the health of children and adolescents with cancer.

Methods

This is a methodological research, in the form of technological production, which aims to build an educational serious game to promote the health of children and adolescents with cancer. The research was developed from October 2023 to August 2024. To build the serious game, the Contextualized Instructional Design (CID) methodology(11) was applied, which consists of the intentional action of planning, developing and applying specific teaching situations. CID is carried out from five distinct stages, namely: analysis, design, development, implementation and evaluation.

The analysis stage consisted of identifying learning needs, defining instructional objectives and identifying the restrictions involved.(11) To this end, a scoping review was carried out, subdivided into five stages: identification of the research question; identification of relevant studies; selection of studies; systematization of data; and collection, cataloging and presentation of results, through which the information that makes up the theoretical framework of this serious game was obtained. In the review, searches were conducted in the Virtual Health Library (VHL) and the U.S. National Library of Medicine of the National Institute of Health (PubMed), using the Health Sciences Descriptors (DeCS) and the Medical Subject Heading Terms (MeSH): "child", "adolescent", "neoplasms", "chemotherapy", "surgery", "radiotherapy" and "signs and symptoms". In addition to the theoretical basis outlined through the scoping review, the content of the serious game was also composed of information present in the manuals of the José Alencar Gomes da Silva National Cancer Institute (INCA). This content was used to create the serious game and was validated by a group of experts in the health field, who had knowledge about pediatric oncology and/or technological development, through analysis of the Content Validation Index (CVI), which measures the proportion of agreement of the research participants, for each item analyzed and on a general scale.(12)

In the design stage, the layout was created with the collaboration of a professional UI/UX Designer, with the help of Adobe Illustrator software, whose main function is to work with vector illustrations, which in this research was used to create the entire graphic part and visual identity of the game, from the logo, the board, to the cards and pins. Once this stage was completed, the third stage began, which included the development of the educational didactic content, the questions and answers on the cards, as well as the rules of the serious game.

In the implementation stage, the design proposal was adapted to the game, and for this purpose a printed board was created on paper, with pins, question and answer cards, along with some additional information about the cancer treatment process, challenge cards and cards with health care tips. After the serious game was created, a usability assessment was carried out, which is equivalent to the monitoring, review and maintenance of the proposed tool; this is the moment when the target audience can influence the construction and improvement of the serious game, carried out based on responses from the application of the “System Usability Scale” (SUS), with values ranging from 0 to 100 points.

The usability assessment was carried out with children and adolescents with cancer, with the number of participants in the sample following the recommendation of Pasquali,(13) which establishes a minimum number of 6 and a maximum of 20 individuals, which resulted in the final sample with 15 individuals. Data were collected at a federal public referral hospital that treats children and adolescents with cancer in the city of Campina Grande, Paraíba, Brazil, from April to June 2024. The inclusion criteria were literate children and adolescents diagnosed with cancer and undergoing antineoplastic treatment. The exclusion and discontinuation criteria were children with low cognitive levels who did not understand the rules of the game or who were unable to continue playing the game due to complications resulting from the side effects of the treatment or the disease itself. The children and adolescents were invited to participate after the objectives and procedures of the research were explained. Upon acceptance of the invitation, the Informed Consent Form (ICF) was completed by their guardians and the Informed Assent Form (AAS) was completed by minors.

A sociodemographic questionnaire was applied to characterize the participants, which contained the following variables: sex, age, diagnosis, and treatment time. Participants were instructed to play the serious game and respond to the usability assessment scale “System Usability Scale” (SUS) in its version validated for the Portuguese language by Tenório.(14) For each topic, the ten items were analyzed and assigned a value, each of which has a Likert-type scale, ranging from: 1 = strongly disagree; 2 = partially disagree; 3 = neither agree nor disagree; 4 = partially agree; and 5 = strongly agree. The even-numbered topics 2, 4, 6, 8, and 10 correspond to negative responses; their scores are equivalent to subtracting five minus the number given on the Likert scale; while the odd-numbered topics 1, 3, 5, 7, and 9 correspond to positive responses; their scores are equivalent to subtracting one from the number on the Likert scale. After quantifying the values obtained in each topic, they were added and multiplied by 2.5; the results obtained ranged from 0 to 100 points, obtained on the System Usability Scale15. Furthermore, the measurements made by the sample participants were evaluated in a relevant manner, in order to contribute to improvements in the tool, content or functionality of the serious game. The serious game was considered satisfactory, sufficient, attractive and relevant, from the point of view of usability, if it achieved scores that were judged as the best performance in the instrument applied by the SUS, with a mean score between 70 and 100.(15)

This research followed the recommendations of Resolution 466/12 of the National Health Council, which regulates the conduct of research involving human beings, and was approved by the Research Ethics Committee of the Federal University of Campina Grande, under Opinion number 5,654,700 and CAAE number 61249622.4.00005182.

Results

The present study resulted in the development of a serious game called Oncoped: on the health journey, composed by combining the terms oncology and pediatrics, which alludes to the target audience, which are children and adolescents with cancer, and the health journey, which reflects the situation they are exposed to due to the disease and the treatment in search of a cure. The serious game Oncoped: on the health journey has as its main theme the experience of the target audience diagnosed with cancer, undergoing antineoplastic treatment. The layout of the serious game and the structure of the board and cards were defined with drawings, images and coloring experienced by children and adolescents

Figure 1. Board model

Note: Início = Start; Esperança = Hope; Coragem = Courage; Amizade = Friendship; Determinação = Determination; Fim = End

The board was developed with 35 squares and 100 cards. The game content contains educational multiple-choice questions in accessible language about cancers, antineoplastic treatment, challenges faced by children with cancer, diagnosis, signs and symptoms resulting from treatment and the most common side effects. In addition, it has cards with information about the importance of doing physical exercise that fits into one's routine, challenges to be carried out with other players, health care tips, curiosities related to cancer and personal care guidelines. Paper Toys (figure 2) were used as pegs, which are personalized markers for each player on the board, which resemble the participants. To this end, the different races and genders were respected, as well as some characters with no hair, because one of the side effects of cancer treatment is hair loss, which can be partial or total (NIC, 2018) and others with hair, because there are drugs that do not cause this effect. A total of eight Paper Toys were created.

Figure 2. ***Paper toys***

The serious game board was printed on two A3 sheets, measuring 42 cm in height and 59.4 cm in width. The cards are on polaseal paper, measuring 9 cm in height and 6 cm in width; the instruction manual was printed on A4 sheets, measuring 21 cm in width and 29.7 cm in height; and the Paper Toys were produced in a material combining polyethylene chloride (PVC) and polyethylene terephthalate (PET), measuring 2 cm in width and 5 cm in height. The roll and move mechanism was used to develop the serious game mechanism, which consists of the player rolling the dice and moving the pins on the board according to the number reached on the dice; luck is the main factor in this mechanic. The point-to-point movement allows the player to occupy points on the board using the pins, connected by lines that serve as the basis for the movements and selection of cards. In this way, it will be possible to choose a card from a limited number available. The usability assessment of the serious game was carried out with 15 participants (Table 1). Most of the children and adolescents had incomplete elementary education (80%), had a monthly family income between one and two minimum wages (60%), used cell phones (93.3%), and played board games (66.67%). The predominant type of cancer was leukemia (66.67%) and the main treatment was chemotherapy or chemotherapy combined with radiotherapy (46.67%).

Table 1. Profile of the 15 hospitalized children and adolescents with cancer

Variable	N	%
Gender		
Female	6	40
Male	9	60
Age		
2 to 4 years	4	26.67
5 to 7 years	4	26.67
8 to 10 years	4	26.67
11 to 18 years	3	20
Education		
Illiterate	3	20
Incomplete Elementary School	12	80
Family Income		
< 1 minimum wage	3	20
1 to 2 minimum wages	9	60
2 to 3 minimum wages	3	20
Number of people living in the house		
2 to 3	5	33.33
4	7	46.67
5	3	20
Race		
White	7	46.67
Mixed-race	8	53.33
Uses cell phone		
Yes	14	93.33
No	1	6.67
Mean hours using cell phone		
1 to 2	7	46.67
3 to 4	4	26.67
5 to 6	2	13.33
7 to 8	2	13.33
Plays board games		
Yes	10	66.67
No	5	33.33
Has a board game at home		
Yes	6	40
No	9	60
How often do you play?		
Rarely	8	53.33
Once a week	3	20
Once a month	4	26.67

Table 1. Profile of the 15 hospitalized children and adolescents with cancer (Cont.)

Variable	N	%
Type of cancer		
Leukemia	10	66.67
Lymphoma	1	6.67
Others	4	26.67
Type of treatment		
Chemotherapy	7	46.67
Chemotherapy + Radiotherapy	7	46.67
Surgery	1	6.67

After the children or adolescents played, they answered the SUS questionnaire (Table 2). The following items were evaluated: ease of play, autonomy, variety of content and age appropriateness. The scores for each participant in the sample obtained through statistical analysis were: mean of 95.16, mode of 100 and median of 97.5. Thus, the usability evaluation of this serious game was classified as "acceptable", considering that its mean SUS score is 95.16.

Table 2. System Usability Scale (SUS) scores of the 15 survey participants

Participant	SUS Score
1	77.5
2	87.5
3	90
4	90
5	95
6	100
7	100
8	95
9	97.5
10	100
11	97.5
12	100
13	100
14	97.5
15	100
SUS mean score	95.16

Discussion

In the last decade, technological advances in the health field have increased the relevance of research on this topic aimed at improving patients' quality of life. From this perspective, technological tools, such as serious games, represent one of the various groups of technologies used for leisure and interaction, which are common in the daily lives of children and adolescents. These tools can also be applied as educational strategies to promote better learning and memorization of certain subjects, as they allow for better engagement and improve health information and therapeutic communication.(7)

Currently, in Brazil, there are websites and manuals on cancer for children and adolescents of an informative and educational nature(2,16) that allow users to be aware and serve as support for frequently asked questions. However, no serious games of an educational nature were found aimed at the use of hospitalized patients in the established age group. Thus, Oncoped: on the health journey, is considered an innovative technology for teaching and nursing care provided to this public, capable of helping to clarify doubts and provide new information based on scientific evidence in an accessible manner and promoting quality in care for children and adolescents with cancer. The use of the mechanisms used in the serious game through the game cards, which contain questions and information, is also shown in another study carried out in the United States, which evaluated, through focus groups, with adolescents aged 12 to 14, the learning about cancer prevention through serious games.(18) In the study, the participants reported the importance of using this methodology for learning, especially because it is a fun and active medium, which makes the educational action more effective and improves the chances of retaining the subject, unlike a lecture or reading a text. In addition, this type of technology can promote encouragement for changing behaviors and making daily decisions. Such technology can facilitate nursing care by providing information and disseminating knowledge about health promotion for children and adolescents.(19) Furthermore, the use of narratives and illustrations that are found in the daily lives of children and adolescents are shown to be technological strategies that describe the content and facilitate learning, in addition to encouraging decision-making and making them analyze daily care and self-care behaviors.(20) The need to use illustrations that resemble the experiences encountered and with which they identify is a way to ensure learning in a playful and fun way.(21) Thus, the layout chosen for Oncoped: on the health journey has attractive and fun elements close to the reality experienced, with the purpose of arousing the interest of children and adolescents in the subject and contributing to improving the care provided to this audience.

The behavior of participants during the use of Oncoped: on the health journey corroborates the understanding that the device met the purpose of being attractive. It was observed that the children and adolescents participating in the research were happy and excited during the application of the game, with time for fun, sharing experiences and knowledge. In this regard, another study highlights the importance of children and adolescents participating in analog games such as board games and cards, as they promote moments of reflection and leisure through experience, in order to expand knowledge and use imagination.(22) Regarding the usability assessment, an essential stage for the knowledge and improvement of the proposed product, the mean was 95.16. It was considered that the desired mean was reached, since the literature indicates a mean greater than or equal to 91 points as adequate.(15)

Among the implications for clinical practice, it is worth noting that Oncoped: on the health journey promotes moments of relaxation and interaction, through play, for children and adolescents undergoing antineoplastic treatment. Furthermore, it allows nursing professionals to share information relevant to health promotion and coping with the disease and treatment. For future studies, it is recommended that professionals be trained to use serious games in their routine as a means of disseminating knowledge, since they are responsible for enhancing learning.

A limitation of this study is the difficulty in finding low-cost materials for producing the serious game that would meet the need for it to be sanitizable for use in the hospital.

This study enabled the development of a serious game as an educational tool for health promotion for children and adolescents with cancer. According to the usability assessment, the game was considered adequate. It is considered that the technology developed can contribute significantly to the dissemination of health and nursing information and knowledge on the subject, to interactions between professionals, children and adolescents, in addition to providing distraction, fun and joy during the game. Furthermore, the game was well-received by the target audience, as patients identified with Paper Toys that were similar to them and found information about situations they had experienced in the cards.

Therefore, it is seen as a contribution to the hospital context that serious games can contribute to the excellence of the quality of care provided by nursing professionals and to the construction of bonds with children and adolescents with cancer, as a means of communication and rapport. The aim is for serious games to be introduced as an educational tool in health services, as they are an innovative educational technology that is easy to apply, well-accepted and capable of disseminating important information about the subject to patients undergoing cancer treatment.

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Risk and factors related to the development of lesions due to xerosis in hospitalized elderly people

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Conflicts of interest: No

Received: July 12th, 2024.

Approved: November 13th, 2024.

How to cite this article: Cruz RAO, Evangelista CB, Silva MA, Araújo CRD, Oliveira JS, Costa MML. Risk and factors related with the development of xerosis lesions in hospitalized elderly people. Investigación y Educación en Enfermería. 2025; 43(1):e03.

DOI: https://doi.org/10.17533/udea.iee.v43n1e03

Investigación y Educación en
Enfermería

Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Risk and factors related to the development of lesions due to xerosis in hospitalized elderly people

Abstract

Objective. To analyze the risk and factors related to the development of skin lesions due to xerosis in hospitalized elderly people. **Methods.** This was a descriptive and cross-sectional study with 455 elderly people hospitalized in Paraíba (Brazil). The Risk Assessment Scale for the Development of Lesions Associated with Xerosis Cutis in Elderly People (ERLAX-53) developed in Brazil by Cruz in 2023 was used. **Results.** The sample consisted of 272 (59.8%) elderly people from the medical clinic and 183 (40.2%) from the ICU, most of whom were females (54.5%). There were high frequencies of the variables "immobility" (58.9%), "friction and shear" (87.7%), "presence of comorbidities" (99.3%) and "predominance of dry skin" (79.8%). The correlation was positive and moderate for "mobility", "level of consciousness", "tactile sensitivity", "temperature" and "phototype". As for the risk of lesions associated with xerosis, 337 (74.1%) were at medium risk and 101 (22.2%) at high risk. **Conclusion.** 96.3% of the elderly people with xerosis cutis who participate in the study were at medium to high risk of developing additional skin lesions, which is why nursing must implement preventive and treatment strategies to care for these people.

Descriptors: nursing; skin aging; elderly health.

Riesgo y factores relacionados al Desarrollo de Lesiones Asociadas a Xerosis Cutánea en personas mayores hospitalizadas

Resumen

Objetivo. Analizar el riesgo y los factores relacionados con el desarrollo de lesiones de xerosis cutánea en personas mayores hospitalizados. **Métodos.** Se trata de un estudio descriptivo transversal realizado con 455 ancianos hospitalizados en Paraíba (Brasil). Se utilizó la Escala de Evaluación de Riesgo para el Desarrollo de Lesiones Asociadas a Xerosis Cutánea en Personas Mayores (ERLAX-53) desarrollada en Brasil por Cruz en 2023. **Resultados.** La muestra estuvo compuesta por 272

(59.8%) ancianos de la clínica médica y 183 (40.2%) de la UCI, siendo la mayoría del sexo femenino (54.5%). Hubo altas frecuencias en las variables inmovilidad (58.9%), fricción y cizallamiento (87.7%), y presencia de comorbilidades (99.3%), y predominio de piel seca (79.8%). La correlación fue positiva y moderada en movilidad, nivel de conciencia, sensibilidad táctil, temperatura y fototipo. En cuanto al riesgo de lesiones asociadas a la xerosis, 337 (74.1%) presentaron riesgo medio y 101 (22.2%) riesgo alto. **Conclusión.** El 96.3% de las personas mayores con xerosis cutánea que participaron en el estudio tuvieron entre riesgo medio y alto de desarrollar lesiones adicionales en la piel, por lo que Enfermería debe implementar las estrategias preventivas y de tratamiento para el cuidado de personas.

Descriptores: enfermería; envejecimiento de la piel; salud de las personas mayores.

Risco e fatores relacionados ao desenvolvimento de lesões por xerose em pessoas idosas hospitalizadas

Resumo

Objetivo. Analisar o risco e os fatores relacionados ao desenvolvimento de lesões por xerose cutânea em idosos hospitalizados. **Métodos.** Trata-se de um estudo descritivo transversal realizado com 455 idosos internados na Paraíba (Brasil). Foi utilizada a Escala de Avaliação de Risco para o Desenvolvimento de Lesões Associadas à Xerose Cutânea em Idosos (ERLAX-53) desenvolvida no Brasil por Cruz em 2023. **Resultados.** A amostra foi composta por 272 (59,8%) idosos da clínica médica e 183 (40.2%) da UTI, sendo a maioria do sexo feminino (54.5%). Houve altas frequências nas variáveis "imobilidade" (58.9%), "fricção" e cisalhamento" (87.7%), "presença de comorbidades" (99,3%) e "predomínio de pele seca" (79,8%). A correlação foi positiva e moderada em mobilidade, nível de consciência, sensibilidade tátil, temperatura e fototipo. Quanto ao risco de lesões associadas à xerose, 337 (74.1%) apresentaram médio risco e 101 (22,2%) alto risco. **Conclusão.** Em 96.3% dos idosos com xerose cutânea que participaram do estudo, apresentaram entre médio e alto risco de desenvolver lesões cutâneas adicionais, portanto a Enfermagem deve implementar estratégias preventivas e de tratamento para o cuidado destas pessoas.

Descritores: enfermagem; envelhecimento da pele; saúde do idoso.

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Introduction

Xerosis cutis is an inherent alteration in the skin that can occur at any stage of life and is related to various factors, such as inflammatory processes, unfavorable environmental conditions and chronic diseases like diabetes and kidney failure. Nonetheless, it is an inherent feature in the aging process, where the Stratum Corneum (SC) is unable to adequately maintain a water concentration gradient between the skin surface and the epidermal cells, which leads to reduced cell renewal and increased transepidermal water loss.(1) The world's population is aging rapidly, which is why estimates suggest that the proportion of elderly people aged 60 and over will more than double between 2015 and 2050, and there will be around 1.5 billion people aged 65 and over by 2050. Aging occurs as a result of a combination of intrinsic and extrinsic factors. Concerning the skin, the greatest impairment occurs due to the reduced water content, which, in addition to decreasing elasticity, alters the protective barrier function of this organ.(2)

The physiological alterations that occur in the skin system of elderly people are characterized by a reduction in dermal thickness, loss of elastic fibers, decrease in subcutaneous adipose tissue, reduction in capillaries in the skin and dryness. The reduction in Natural Moisturizing Factors (NHF), which act to control and maintain the natural hydration unveiled by the skin, and the impairment of the lipid layer mean that there is a greater loss of water in the Stratum Corneum (SC).(3) Thus, the clinical signs of xerosis are dryness characterized by flaking, cracking and even inflammation, especially because it is a condition that can be accompanied by pruritus, which will, consequently, increase the risk of secondary infections. As a result of the failure to maintain an adequate water concentration gradient between the living cells of the epidermis and the surface of the skin, there is also a decrease in the production of sebum and sweat.(4)

The adverse outcomes and impacts of skin aging are becoming a global challenge for the health of elderly people, as dermal alterations have significant and widespread implications. After the age of 50, the frequency of conditions that alter the functions and appearance of the skin increases in parallel with epidermal dysfunction. Epidermal dysfunction predisposes to xerosis, pruritus, atopic dermatitis and contact dermatitis. These alterations affect up to 70% of elderly people, with xerosis and pruritus being the most common skin disorders.(5) A study conducted with 314 elderly people living in long-term facilities in Berlin found a high prevalence of xerosis of up to 95.9%. A multicenter study with 11,602 elderly people admitted to hospitals and asylums revealed a prevalence of 34.4%, mainly located in the upper and lower limbs, with significant skin dryness. Among patients with skin care dependency, the proportion of those with dry skin was 84.7%.(2,6) Both in research and in care practice, the various triggers of xerotic skin, the conditions considered to be at

risk and the set of interventions and products used as preventive practices have been perceived. Skin care is a fundamental aspect of clinical nursing practice. In this context, it is worth highlighting issues related to hygiene and the use of products with moisturizing properties applied to the skin, as they represent care measures that contribute substantially to prevention and treatment.(7)
The attention and care given to people at risk or who already have skin lesions is primarily carried out by nurses. In order for this to be effective, a dynamic and comprehensive process with interprofessional participation is necessary. Nonetheless, both the prevention and treatment of skin lesions entail significant costs for health services and other institutions, as they require a large amount of material inputs and human resources, as well as increasing the workload. Audits carried out in public health services have revealed that inconsistencies in the management of lesions and the use of outdated methods contribute to high costs and ineffective results.(8) Thus, one can perceive the importance of a careful assessment of the skin, which will serve as a basis for clinical reasoning and decision making, as well as the use of instruments that can alert to the risk of skin lesions, such as the Risk Assessment Scale for the Development of Lesions Associated with Xerosis Cutis in Elderly People (ERLAX-53),(9) designed to help nurses to identify the risk score for lesions associated with xerosis and contribute to the planning and quality of care provided to this clientele.

Skin lesion prevention protocols have demonstrated a reduction in the incidence of these problems. When integrating these protocols, risk prediction scales are often studied and implemented. Scientific production on xerosis cutis in the elderly population is diffident, and sometimes the emphasis is restricted to aspects related to dry feet due to complications of diabetes or as a risk factor for skin tears, which justifies broadening the scope of knowledge about the real conditions of the population under study, as well as corroborating the strengthening of nursing care practice through a comprehensive instrument, designed and based on the theoretical foundation of a prescriptive theory. Its guiding question is: What is the risk and its correlated factors for the development of lesions due to xerosis cutis in hospitalized elderly people assessed using the ERLAX-53? In view of the above, this study seeks to analyze the risk and factors correlated with the development of lesions due to xerosis cutis in hospitalized elderly people assessed using the ERLAX-53.

Methods

This is a cross-sectional study carried out in a medium-sized general hospital in the metropolitan region of João Pessoa, located in the state of Paraíba, Brazil. The institution was chosen because it routinely receives a considerable number of elderly people, as well as serving as a teaching and training institution for undergraduate and residency students in hospital health. It has 50 beds in the Medical Clinic (MC) and eight in the Intensive Care Unit (ICU). The population was composed and estimated based on the number of elderly people admitted in the year prior to collection, with 706 in the clinic and 338 in the ICU. Considering a sampling error of 5% and a confidence level of 95%, the minimum sample considered sufficient was 250 elderly people admitted to the MC and 180 to the ICU. Accordingly, the non-probabilistic and convenience sample consisted of 272 and 183 respectively from each unit, making a total of 455 participants who met the inclusion criteria and agreed to participate in the research.

The inclusion criteria were: being aged 60 or over and hospitalized for at least 24 hours in the institution. For those with cognitive impairment, assessed on the basis of the mental state item on the Morse Scale, the family members/guardians were consulted as to whether or not they would authorize their participation in the study. Furthermore, those who were hemodynamically unstable or developed restrictions that made assessment impossible were excluded, as well as patients readmitted during the data collection period, which occurred between January and October 2023.

In order to collect the data, the ERLAX-53 was used in conjunction with the participants' sociodemographic data questionnaire. The scale showed evidence of validity with a Content Validity Coefficient (CVC) of 0.926, while the reliability with Cronbach's Alpha and McDonald's Omega were 0.815 and 0.942, respectively,(9) proving to be useful for conducting preventive measures during care management. It has 15 variables and was designed from a scoping review in which the conditions that increase the risk of lesions due to xerosis in the elderly population(8) were mapped and theoretically based on the Basic Human Needs Theory. Risk stratification is defined as low risk (15 to 27), medium risk (28 to 40) and high risk (41 to 53). The application time was approximately 10 minutes for each patient in both the MC and ICU settings and was carried out by two nurses, one of whom was a specialist nurse in dermatological nursing, together with the researcher responsible for the morning and afternoon shifts.

In the ICU, it always occurred in the afternoon period, due to the routine visiting hours and the need for consent from those responsible. Everyone was informed about the objectives of this study and signed a consent form to participate in it. The water temperature was checked using a thermometer specifically designed for this purpose and based on kerosene. Tactile sensitivity was assessed using a Semmes-Weinstein monofilament, also known as a foot esthesiometer. In patients with bilateral amputation, the test was carried out on the hands according to the recommendations for applying the scale.

It was decided to analyze which variables presented a correlation with high risk. To this end, the Spearman's correlation test was used, analyzing ranking positions, where the closer to -1 or + 1, the stronger the correlation. Positivity indicates that the variables are directly proportional, while negativity is inversely proportional. A value of zero indicates that there is no correlation. The parameters for interpreting the size of the effect are displayed in Table 1.(10)

Table 1. Values and meaning for correlation analysis. João Pessoa, PB, Brazil 2023

Value	Meaning
-1	Strong and perfect negative correlation
-0.9 a -0.99	Very high negative correlation
-0.7 a -0.89	High negative correlation
-0.4 a -0.69	Moderate negative correlation
-0,2 a -0,39	Low negative correlation
-0.01 a -0.19	Very low negative correlation
0	Null correlation
0.01 a 0.19	Very low positive correlation
0.2 a 0.39	Low positive correlation
0.4 a 0.69	Moderate positive correlation
0.7 a 0.89	High positive correlation
0.9 a 0.99	Very high positive correlation
1	Large and perfect positive correlation

The significance level used was $p<0.001$. After the data was collected, it was entered into the Excel for Windows program and then transferred to the Statistical Package for the Social Sciences (SPSS) software, version 27.0, where descriptive statistical analyses of distribution and frequency were carried out, as well as Spearman's correlation test between variables and high risk.

The research was conducted in accordance with Resolution 466/2012 of the Brazilian National Health Council, as well as Resolution 564/17 of the Brazilian Federal Nursing Council, obtaining approval under CAAE nº 60658022.8.0000.5188 and Opinion nº 5.626.694. All participants were informed of the objectives of this study and signed a consent form to participate in it.

Results

Table 2 presents the description of the sociodemographic characterization of the 455 elderly people to whom the ERLAX-53 was applied. It should be underlined that most of them were hospitalized in the MC were females, lived with family members and were retired. The average age was 78.5 years (SD = 10.7; minimum = 60; maximum = 97). Of these, 170 (37.4%) were married and 305 (67%) had a family income of two minimum wages or more.

Table 2. Sociodemographic variables of the 455 hospitalized elderly people. João Pessoa, PB, Brazil, 2023

Variables	*n* (%)
Unit	
Medical clinic	272 (59.8%)
ICU	183 (40.2%)
Gender	
Male	207 (45.5%)
Female	248 (54.5%)
Marital status	
Married	170 (37.4%)
Single	108 (23.7%)
Widowed	170 (37.4%)
Stable union	7 (1.5%)
Family arrangement	
Family	388 (85.3%)
Alone	54 (11.9%)
LTCF*	13 (2.9%)
Occupation	
Retired	332 (73%)
INSS Benefit**	45 (9.9%)
Self-employed	78 (17.1%)
Family income	
Up to a minimum wage	150 (33%)
From two minimum wages	305 (67%)

* Long-Term Care Facility; **Brazilian National Institute of Social Security; Value of the minimum wage in the collection period: R$ 1320/ US$ 241.

The results of the 15 variables assessed during the application of the ERLAX-53 are displayed in Table 3, where it can be observed that, among the highest frequencies, immobility or very limited stand out, which together were present in 303 elderly people (66.6%). Friction and shear were found in 399 (87.7%), presence of comorbidities in 399 (87.7%) and decreased turgor and elasticity in 452 (99.3%), in addition to absence of tactile sensitivity in 199 (43.7%).

Of the total sample, 268 (58.9%) were intensively sedated or comatose, 363 (79.8%) had dry skin texture and 169 (37.1%). associated with deep wrinkles (37.1). Pruritus was absent in 441 (96.9%) of the sample, 206 (45.35%) of whom used any available hydrating product (also known as moisturizer) and 232 (51%) of whom said they applied it once a day. The water temperature for bathing was below 34° in 301 (66.2%) and 182 (40%) were eutrophic. White skin was the most common phototype in 142 (31.2%). Furthermore, 337 (74.1%) were at medium risk of developing lesions and 101 (22.2%) were at high risk.

Table 3. Distribution of the results of the application of the ERLAX-53. João Pessoa, PB, Brazil 2023

Variables	*n* (%)
Age	
60-69	210 (46.2%)
70-79	111 (24.4%)
>80	134 (29.5%)
Level of consciousness	
Conscious/oriented	194 (42.6%)
Disoriented	40 (8.8%)
Light/drowsy sedation	36 (7.9%)
Moderate/torporous sedation	57 (12.5%)
Intense/comatose sedation	268 (58.9%)
Mobility	
No limitation	68 (14.9%)
Little limited	84 (18.5%)
Very limited	35 (7.7%)
Immobility	268 (58.9%)
Friction/shear	
Absent	56 (12.3%)
Present	399 (87.7%)
Comorbidity	
Absent	3 (0.7%)
Present	399 (87.7%)
Turgor/elasticity	
Preserved	3 (0.7%)
Decreased	452 (99.3%)
Tactile sensitivity	
Preserved	186 (40.9%)
Decreased	70 (15.4%)
Absent	199 (43.7%)

Table 3. Distribution of the results of the application of the ERLAX-53. João Pessoa, PB, Brazil 2023 (Cont.)

Variables	*n* (%)
Texture	
Hydrated	7 (1.5%)
Oily	1 (0.2%)
Mixed	84 (18.5%)
Dry	363 (79.8%)
Pruritus	
Absent	441 (96.9%)
Present	14 (3.1%)
Pre-existing alterations	
Absent	5 (1.1%)
Photodermatoses	82 (18%)
Deep wrinkles	169 (37.1%)
Flaking	60 (13.2%)
Cracking	139 (30.5%)
Product for hydrating and/or lubricating the skin	
Uses as indicated	90 (19.8%)
Use any available hydrating product	206 (45.35%)
Uses nothing	159 (34.9%)
Hydration routine	
Twice a day	61 (13.4%)
Once a day	232 (51%)
Hydrates without an established routine	10 (2.2%)
None	152 (33.4%)
Water temperature for bathing	
Less than 34ºC	301 (66.2%)
Between 34ºC and 36ºC	9 (2%)
Greater than 36ºC	145 (31.9%)
Body mass index (BMI)	
Between 18.5 and 24.9	182 (40%)
Between 25 and 29.9	167 (36.7%)
Between 30 and 34.9	54 (11.9%)
Between 35 and 39.9	18 (4%)
<18.5	23 (5%)
>40	11 (2.5%)
Phototype	
Black	54 (11.9%)
Dark brunette	56 (12.3%)
Moderate brunette	94 (20.7%)
Light brunette	99 (21.8%)
White	142 (31.2%)
Extremely white	10 (2.2%)
Risk	
Low	17 (3.7%)
Medium	337 (74.1%)
High	101 (22.2%)

Based on the results of the Spearman's correlation test displayed in Table 4, the variables "level of consciousness", "mobility", "tactile sensitivity", "temperature" and "phototype" showed a positive and moderate correlation in relation to high risk, while the variables "pre-existing alterations", "age", "friction/shear", "BMI" and "texture" showed a positive and low correlation. The variables "turgor/elasticity" and "comorbidity" showed a positive correlation, although it was very low.

Table 4. Spearman's correlation test and p-value between the ERLAX-53 variables and high risk. João Pessoa, PB, Brazil 2023

Variable	Spearman's r
Level of consciousness	0.50*
Mobility	0.50*
Tactile sensitivity	0.43*
Temperature	0.41*
Phototype	0.40*
Pre-existing alterations	0.36*
Age	0.31*
Friction/shear	0.31*
BMI	0.25*
Texture	0.24*
Turgor/elasticity	0.17*
Comorbidity	0.08
Pruritus	-0.07
Hydration routine	-0.02
Product for hydrating and/or lubricating the skin	-0.001

* $p < 0.001$

Discussion

The growing number of hospitalizations of elderly people is proportional to the aging of the population. In view of this increase. Researchers have warned about the control and risk factors for the appearance of skin lesions, and strongly recommend that nurses and their teams be trained in the use of appropriate technologies, as well as emphasizing the need to maintain barrier function, reduce friction and shear, and hygiene care. Despite the wide range of skin care products and brands on offer, some aspects need to be considered, such as purchasing power, choice of product, purpose, skin type and care routine. Regarding this last aspect, although in this study the number of males and females was almost the same, and did not represent significance during the test. In a study conducted in the United Kingdom with two groups of men, one aged between 18 and 27 and the other between 28 and 59, the growing interest in skin care products by men was observed; however, it revealed that this behavior is aimed at improving aspects related to appearance, and also that this routine is something that men use discreetly and usually hide for fear of suggesting feminizing or narcissistic behavior.(12)

This study found that the majority of elderly people lived with family members were retired and had an income of two minimum wages or more. There is a need to pay attention to socio-economic issues, since the lack of products to protect or repair the skin has become commonplace, especially in public or philanthropic hospital institutions, making it necessary for the patient or family member to buy them themselves. When asked why they did not use a product to moisturize their dry skin, they routinely replied that they could not afford it. In addition to this problem, in a study carried out in 2020 that looked at projected spending in Brazil, considering three components: income, demographics and household (that which is not related to demographics or income), it was observed that 26.8% of the increase in the need for health funding was due to the aging population.(13)

When looking at the correlation between the variableson the scale and high risk, level of consciousness and mobility showed a weak, positive correlation and statistical significance. Reducing the level of consciousness in the hospital environment can be a condition of the elderly person or a necessity. Both delirium and sedation compromise autonomy, as well as the response to external injuries and restrict mobility. In a study with a sample made up of elderly people with an average age of 85.4 years, it was identified that xerosis cutis, incontinence-associated dermatitis, other skin lesions, pressure sores (PS) and intertrigo were not associated with each other, however, adverse skin conditions appeared mainly in the long-lived and care-dependent, who had limited mobility.(6) Regarding tactile sensitivity, a study carried out in England obtained significant results when analyzing the correlation of three variables with age in relation to tactile perception. A negative correlation was found between hydration and age ($r=-0.59$) and biological elasticity and age ($r=-0.46$). Nonetheless, there was a positive correlation between the area of perception of the digital pulp and age ($r=0.53$)(14). Reduced or absent tactile sensitivity may be a consequence or cause of the appearance of lesions, as in the case of xerosis, a situation which is usually aggravated by a decrease in vascularization, as well as a decline in the production of sweat and sebaceous glands, which also lead to disturbances in thermoregulation.(15) Temperature in the elderly should be observed and assessed with caution. In a systematic review conducted in Japan, it was observed that among adults and the elderly, the subjective aspects related to the feeling of comfort are, in fact, the items considered. The same study highlights a study that involved bathing infarcted patients in bed at a temperature of 40°C and 42.5°C, and revealed that with the higher temperature, there was an increase in SpO_2 and a reduction of 1% in heart rate. In this study, the water temperature for bathing in the ICU remained at around 40°C, which is considered high even though it is recommended that the temperature of the environment, through air conditioning, should be between 20 and 24°C, in order to reduce metabolic work, contribute to body temperature control, hemodynamic stabilization, neurological protection and inflammation control.(16) Thus, the main objective of heating the water for the bed bath routine is to bring comfort to patients; however, in countries with tropical climates, a range between 34° and 36°C has been recommended, considering that hot water removes natural oiliness and further promotes dryness.(17)

It is believed that this and other findings inherent to aspects, such as mobility, alterations in the level of consciousness and friction and shear have been relevant to the positive correlation between the hospitalization sector and the high risk of injury associated with xerosis cutis in hospitalized elderly people. These are environments that offer medium or highly complex care experience bed restriction, the need for frequent decubitus changes, the constant need for assessment and care in the presence of changes in the level of consciousness, as well as injuries caused by friction and shear, which demand material and human resources from nursing, in order to guarantee effective and quality care.

Another relevant aspect is the skin phototype, since the various methods for characterizing skin type direct care because they guide the selection of the most appropriate products and optimize clinical results. It is imperative to consider that photoaging involves the appearance of wrinkles, spots, dryness and loss of elasticity, aspects that characterize xerosis. There are two phenotypes of photoaging: hypertrophic photoaging, with thick and deep wrinkles, and atrophic photoaging, with a smooth and relatively wrinkle-free appearance, telangiectasia and the presence of lesions.(18) Photosensitivity can result in various symptoms, diseases or conditions (photodermatoses) caused or exacerbated by exposure to sunlight and ultraviolet radiation, where chronic evolution is characterized by phototoxicity and photoarthralgia. Both conditions, especially in white skin, worsen the process of skin flaking. When associated with the presence of deep wrinkles, irritation and pruritus can lead to the occurrence of cracking.(19) The sample showed a percentage of 31.2% of people with white skin. Furthermore, when the correlation analysis was carried out with high risk, it was weak, but positive and with a level of significance.

Another relevant aspect is skin phototype, since the various methods for characterizing skin type guide care, as they guide the selection of more appropriate products and optimize clinical results. It is imperative to consider that photoaging involves the appearance of wrinkles, blemishes, dryness and loss of elasticity, aspects that characterize xerosis. There are two phenotypes of photoaging: hypertrophic photoaging with thick and deep wrinkles, and atrophic photoaging, with a smooth appearance and relatively no wrinkles: telangiectasia and presence of lesions.(18) Photosensitivity can result in several symptoms, diseases or conditions (photodermatoses) caused or exacerbated by exposure to sunlight and ultraviolet radiation, where the chronic evolution is characterized by phototoxicity and photoarlegia. Both conditions, especially in white skin, worsen the skin flaking process and, when associated with the presence of deep wrinkles, irritation and pruritus, can lead to the occurrence of cracks.(19) The sample showed a percentage of 31.2% of people with white skin; and when performing the correlation analysis with high risk, it was weak, but positive and with a level of significance.

Friction and shear was a condition present in 87.7% of the sample and one of the extrinsic risk factors, especially for the PS, British researchers underline the importance of knowledge and safety when prescribing or indicating products. When describing a person's skin receiving a significant shear load through frictional interactions, the result is damage to the stratum corneum, with consequent redness, inflammation, bullous eruptions, open and pressure lesions. It is well known that shear and friction pose a risk to the skin health of elderly people due to reduced blood flow, weakness and cell death, as well as tissue fragility.(20) A study conducted in Australia, which sought to analyze the prevalence and characteristics of skin lesions in a tertiary hospital over ten years, warned of the importance of training staff, as well as optimizing strategies for the proper handling and transfer techniques of patients, especially with regard to protecting the limbs of older people whose fragile and thinner skin is easily damaged by shear and friction forces.(21)

Although the BMI variables, texture and turgor and elasticity show a negligible level of correlation, their importance should not be invalidated when considering the need for preventive measures. The impact of an inadequate diet goes beyond the prevention and healing of wounds, with subsequent effects that contribute to higher rates of comorbidity. The poor quality of the diet of obese people contributes to inefficient glucose control, dyslipidemia and a worsening of cardiovascular diseases, while malnourished people have a reduced response to health problems, poor circulation and greater susceptibility to infections. A multicenter study showed that nutritional supplements for the prevention and treatment of wounds were associated with a more than four-fold increase in the chances of healing, but it is clear that research on the topic is still incipient.(22)

Nurses routinely inspect the skin on a daily basis and must be vigilant when caring for the elderly patient. Characterizing the texture of the skin will guide the indication and use of products, especially when faced with sensitive skin. A Chinese study testing skin assessment instruments found that the skin barrier was damaged, the texture was rough and there was an active inflammatory process in people with sensitive skin. The importance of assessment and assertive care, using anti-inflammatories and moisturizers (hydrating products), improved texture and hemoglobin, increased hydration of the stratum corneum, reduced transepidermal water loss and decreased the area of sensitive skin.(23) Turgor and elasticity are altered with the progression of aging. Among the alterations, once can mention: thinning of the dermal thickness, changes in collagen and elastic fibers, as well as alterations in the fundamental substance. There is a reduction in the synthesis of type I collagen and a predominance of type III in the elderly patient, as well as an increase in collagenase levels. The amount of mucopolysaccharides decreases in line with the elastic fibers, which become smaller in number and diameter. The decrease in hyaluronic acid also negatively influences the turgor and elasticity of the skin,(24) which is why its identification alone is indicative of preventive care.

The lack of correlation in relation to pruritus stands out, as it differs from other studies of elderly people that indicate a prevalence of 21% worldwide and 40% in America. Senile pruritus is defined as generalized pruritus in patients without primary skin lesions, considered to be a common skin disease in the geriatric population that brings with it an unpleasant skin sensation that causes itching and can be accompanied by skin lesions, pain and infection when not treated properly. Risk factors include smoking, excessive alcohol consumption and monophagism.(25)

Conversely, the variable related to "product for hydrating and/or lubricating the skin", despite being two fundamental aspects for both the prevention and treatment of xerosis, showed no correlation when the analysis was carried out between the two and high risk, probably due to the inherent characteristics of the sample. Moreover, 45.35% use any available moisturizer and 51% apply it at least once a day, which improves the scores on the scale. The main function of a moisturizer is to control moisture loss; however, when the barrier is compromised, it is necessary to first suppress water loss and then restore the barrier. When the moisturizer works properly on the skin, homeostasis is maintained and the oily component creates a film that allows the barrier to be repaired. Therefore, it is agreed that excellent moisturizing agents serve as adjuvants to treat and prevent diseases and also to relieve the symptoms of skin diseases, such as itching and burning.(26) They are classified as emollients that fill gaps in the stratum corneum, humectants that are substances applied to the surface of the skin, which remove moisture from the atmosphere and moisture below the stratum corneum towards the stratum corneum and, finally, occlusives, which are oily substances that overlay the stratum corneum, as well as having the ability to reduce transepidermal water loss.(27)

Regarding the frequency of hydration, there is still no consensus in the pertinent literature, given the specificities of each skin type, body region and sun exposure, among others. However, clinical trials to test new products routinely do so with twice-daily application.(28) An Australian study with 443 elderly people over 70 years of age concluded that there were no statistically significant differences for the prevention of skin tears between the intervention and control groups, thus strengthening the need for further research on the topic.(29)

One limitation of the study was the fact that it was carried out in only one hospital, which may compromise the potential for generalization. There is a need to apply the scale in other contexts and profiles of care for the elderly population, since this conduct would enable a more reliable and expanded diagnosis. A collection bias is possible, considering that only two nurses performed it. Finally, a lack of productions on xerosis cutis in Brazil, which compromises the discussion of the research, when considering cultural and economic issues in other countries.

It is believed that the results found in this study can contribute to the practice and care of nurses in the management of preventive and treatment strategies in the presence of xerosis. It is hoped that the scale can be incorporated into the routine of services, in order to offer support for decision-making and through care, prevent complications and always improve the quality of care for hospitalized elderly people. Further studies should be carried out in other regions, with other patients and other institutions, with a view to observing the characteristics of the patients and whether the results maintain the same profile or not, through the application of scale.

Funding: The current work was developed with the support of the Coordination for the Improvement of Higher Education Personnel (CAPES, as per its Portuguese acronym) - Financing Code 001 (granting of a doctoral scholarship).

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Effectiveness of an educational intervention on the components of the metabolic syndrome of adults with type 2 diabetes: non-randomized clinical trial

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Conflicts of interest: None

Received: October 4, 2023.

Approved: November 5, 2024.

How to cite this article: Araújo WA, Santos ISC, Silveira A, Rosa RS, Souza CS, Cruz DP, Damaceno TO, Araújo TFS, Maia GLA, Rocha RM. Effectiveness of an educational intervention on the components of the metabolic syndrome of adults with type 2 diabetes: non-randomized clinical trial. Investigación y Educación em Enfermería. 2025; 43(1):e04

DOI: https://doi.org/10.17533/udea.iee.v43n1e04

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Effectiveness of an educational intervention on the components of the metabolic syndrome of adults with type 2 diabetes: non-randomized clinical trial

Abstract

Objective. To verify the effectiveness of an educational intervention on the components of metabolic syndrome in adults with type 2 diabetes. **Methods.** A non-randomized clinical trial included 51 adults (48.73±7.84 years old; 86.3% women) diagnosed with type 2 diabetes and metabolic syndrome (intervention group, *n*=26; control group, *n*=25). The intervention consisted of a multidisciplinary health promotion educational program over six months, structured in seven workshops led by nurses. The primary outcome was the improvement of metabolic syndrome components, and the secondary outcome was the reduction in the number of metabolic syndrome criteria assessed at two time points, baseline and after six months of monitoring. **Results.** Compared to the control group, the educational program reduced glucose levels (*p*=0.001) and improved high-density lipoprotein cholesterol concentrations (*p*=0.001) in the intervention group participants at six months. A significant decrease in the mean metabolic syndrome score was observed in the intervention group, while the control group showed an increase (*p*=0.033). At the end of the study, 11.5% of the participants in the intervention group no longer met the criteria for metabolic syndrome. **Conclusion.** A nurse-led health promotion educational program was effective in improving glucose and high-density lipoprotein cholesterol levels among adults with type 2 diabetes and metabolic syndrome, as well as reducing the number of metabolic syndrome components in the participants.

Descriptors: health education; community health nursing; life style; diabetes mellitus type 2; metabolic syndrome.

Efectividad de una intervención educativa sobre los componentes del síndrome metabólico en adultos con diabetes tipo 2: ensayo clínico no aleatorio

Resumen

Objetivo. Verificar la efectividad de una intervención educativa sobre los componentes del síndrome metabólico en adultos con diabetes tipo 2. **Métodos.** Ensayo clínico no aleatorizado que incluyó a 51 adultos (48.73±7.84 años de edad; 86.3% mujeres) diagnosticados con diabetes tipo 2 y síndrome metabólico (grupo de intervención, *n*=26; grupo de control, *n*=25). La intervención consistió en un programa educativo de promoción de la salud de carácter multidisciplinario durante seis meses, estructurado en siete talleres liderados por enfermeros. El desenlace primario fue la mejora de los componentes del síndrome metabólico, y el desenlace secundario fue la reducción en el número de criterios del síndrome metabólico evaluados en dos momentos: en la condición basal y después de seis meses de seguimiento. **Resultados.** En comparación con el grupo de control, el programa educativo redujo los niveles de glucosa (*p*=0.001) y mejoró las concentraciones de colesterol de lipoproteínas de alta densidad (*p*=0.001) en los participantes del grupo de intervención a los seis meses. En el grupo de intervención, se observó una disminución significativa en la puntuación promedio del síndrome metabólico, mientras que el grupo de control mostró un aumento (*p*=0.033). Al final del estudio, el 11.5% de los participantes del grupo de intervención ya no cumplían con los criterios de síndrome metabólico. **Conclusión.** Un programa educativo de promoción de la salud liderado por enfermeros fue eficaz para mejorar los niveles de glucosa y colesterol de lipoproteínas de alta densidad en adultos con diabetes tipo 2 y síndrome metabólico, además de reducir el número de componentes del síndrome metabólico en los participantes.

Descriptores: educación en salud; enfermería en salud comunitária; estilo de vida; diabetes mellitus tipo 2; síndrome metabólico.

Efetividade de uma intervenção educativa sobre os componentes da síndrome metabólica de adultos com diabetes tipo 2: ensaio clínico não-randomizado

Resumo

Objetivo. Verificar a efetividade de uma intervenção educativa sobre os componentes da síndrome metabólica de adultos com diabetes tipo 2. **Métodos.** Ensaio clínico não-randomizado que incluiu 51 adultos (48.73±7.84 anos de idade; 86.3% mulheres) com diagnóstico de diabetes tipo 2 e síndrome metabólica (grupo intervenção, *n*=26; grupo controle, *n*=25). A intervenção consistiu em um programa educativo de promoção da saúde com caráter multidisciplinar, durante seis meses, estruturado em sete oficinas lideradas por enfermeiros. O desfecho primário foi a melhora dos componentes da síndrome, e o secundário, a redução do número de critérios da síndrome metabólica avaliados em dois momentos, na condição basal e após seis meses de acompanhamento. **Resultados.** Em comparação com o grupo controle, o programa educativo reduziu os níveis de glicose (*p*=0.001) e melhorou as concentrações da lipoproteína-colesterol de alta densidade (*p*=0.001) dos participantes do grupo intervenção aos seis meses. No grupo intervenção, observou-se diminuição significativa na média da pontuação da SM, enquanto o grupo controle apresentou aumento (*p*=0.033). Ao final do estudo 11.5% dos participantes do grupo intervenção não preenchiam mais os critérios de síndrome metabólica. **Conclusão.** Um programa educativo de promoção da saúde liderado por enfermeiros foi eficaz para melhorar os níveis de glicose e da lipoproteína-colesterol de alta densidade entre adultos com diabetes tipo 2 e síndrome metabólica, além de causar redução do número de componentes da síndrome metabólica dos participantes.

Descritores: educação em saúde; enfermagem em saúde comunitária; estilo de vida;diabetes mellitus tipo 2; síndrome metabólica.

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Introduction

The prevalence of metabolic syndrome (MetS) has reached epidemic proportions in the adult population, as well as for the chronic diseases commonly associated with this syndrome, especially type 2 diabetes mellitus (T2DM) and cardiovascular diseases (CVD). This scenario demands one of the greatest concerns in the context of public health worldwide.(1) It was recently reported that 38.4% of adults have MetS in Brazil, being mainly predominant among women (41.8%) and individuals with a low level of education (47.5%).(2) Considering T2DM cases, the burden of MetS was also generally significantly higher among women (94.43%) with diabetes than among men (76.54%).(3)

Metabolic Syndrome is characterized by a set of cardiometabolic markers that include increased waist circumference, blood glucose, blood pressure, triglycerides and reduced levels of high-density lipoprotein-cholesterol (HDL-c).(4) The association of at least three of these markers defines its diagnosis, and consequently awakens with greater urgency the need for immediate intervention for proper management. MetS causes constant insulin resistance and hyperinsulinemia, which leads to deterioration of β-cell function, so it has often been associated with T2DM.(5,6) It was also noticed that high waist circumference, decreased HDL-c and increased blood pressure were the most frequent diagnostic criteria in Brazilian adults diagnosed with MetS.(2,5) Also according to the literature, it is a syndrome of complex and multifaceted origin with silent evolution, in addition to not being fully understood.(1) However, it has been strongly suggested that sedentary lifestyle and unhealthy eating patterns may play a key role in its development. Thus, the chronic nature of DM2, as well as of MetS itself, requires changes in lifestyle and stimulus in the self-care of patients within the scope of primary health care. That is, interventions that mainly consist of increasing the level of physical activity and improving eating habits have been shown to improve the components and risk factors of MetS.(7,8) One of our studies also showed improvement in pain domain and increased knowledge about MetS among adults with low education level.(4) Other programs that intervened in lifestyle demonstrated a reduction in the number of diagnostic criteria for MetS.(9) However, most of these programs have an intensive and restrictive character, often focused on weight loss; however, under these conditions, low adherence is the main obstacle.(10)

Currently, there is a lack of data on the effectiveness of health promotion programs aimed at improving knowledge of MetS and the lack of analysis of its effects on the metabolic parameters of adults affected by diabetes and MetS in the context of primary health care, making it difficult to deliver multidisciplinary lifestyle interventions.(11,12) Therefore, a multidisciplinary educational program for health promotion was developed, led by nurses, with encouragement for lifestyle changes in adults with MetS. This study aimed to verify the effectiveness of an educational intervention on the components of MetS in adults with DM2.

Methods

Study design. Study design. This was a non-randomized, open-label, controlled clinical trial with two parallel groups (registration number: RBR-43K52N) conducted in a primary health care center located in the urban area of Jequié, BA, Brazil. This study was part of a larger research project on the evaluation of an educational program in MetS.

Participants. Participants were recruited through an invitation made by the team of researchers during the usual care for hypertension and DM2 in the health center, this initial approach followed a standardized screening protocol for clinical evaluation according to the eligibility criteria of the research. Initially, the sample size was 80 participants, considering an effect size of 0.25, an alpha error of 5%, a statistical power of 80% and a sample loss of 20%.Inclusion criteria included adult (between 18 and 59 years of age) male and female subjects diagnosed with T2DM and three or more of the following criteria for MetS:(13) (a) waist circumference >102 cm in males and >88 cm in females; (b) fasting glucose ≥100 mg/dl; (c) blood pressure ≥130/85 mmHg; (d) triglycerides ≥150 mg/d and (e) HDL-c <40 mg/dl in males and <50 mg/dl in females. Individuals who presented any of the following situations were excluded: pregnancy and having more than 50% of absences in the workshops. During the clinical screening evaluation, written consent was obtained from all participants.

The distribution flowchart of the study participants is shown in Figure 1. A total of 108 volunteers were recruited, among them 70 adults with diabetes (68.4%) from the health center were considered for analysis of this study. Finally, the eligible participants of the research were intentionally divided into two groups: an intervention group (*n*=35), which participated in the health promotion educational program entitled “Caring for Educating in the Metabolic Syndrome”, and another control group (*n*=35), which maintained usual care. In the intervention group, nine participants were excluded: one for having become pregnant and eight for having low attendance at the workshops. In the control group, ten participants were excluded: two moved to another city and eight had no interest in continuing the research. Therefore, a total of 51 diabetic adults (26 in the intervention group and 25 in the control group) participated in the entire intervention program and were included in the analyses.

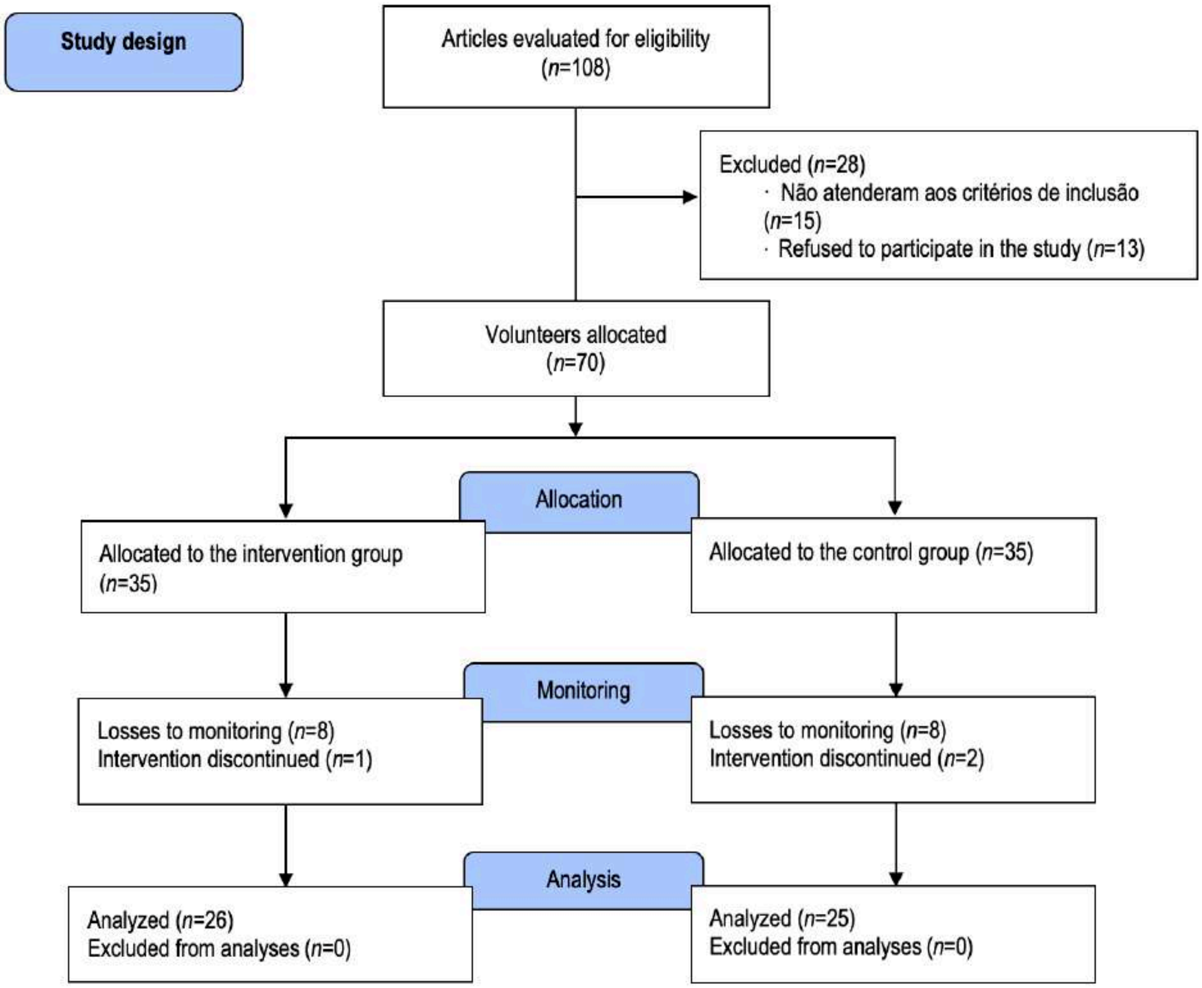

Figure 1. Participant selection flowchart

Intervention and control groups. Initially, all study participants received general information about MetS. In addition, each participant individually was informed about the number of MetS components and their condition of high metabolic risk. Participants in the intervention group received, through an educational program, guidance on how to change their lifestyle based on the Pedagogy of Autonomy.(14) Seven group workshops were held, led by nurses, with monthly frequency and duration of 90 to 120 minutes, in the health center itself after routine care. The workshops were structured in two moments, in the first the participants were received, and soon after the project nurses provided knowledge about the aspects of MetS and its risk factors according to the clinical guidelines for adults (concept, diagnosis, treatment, complications and stimuli for behavioral changes).(15-17) In the second moment, an invited health professional talked to the participants about topics of interest to the group, which were defined at the end of each workshop.

In this multidisciplinary approach, the invited nutritionist provided instructions for maintaining a healthy diet (limiting high-calorie foods and products; paying attention to the quality of fats; increasing the intake of fruits and vegetables, cereals and legumes; daily intake <6 g of iodized salt and reducing alcohol consumption). The psychologist discussed the influence of stress and anxiety as a risk factor for MetS and its associated conditions. We encourage participants to practice at least 150 minutes/week of physical activity; the physical education professional performed some demonstrations of physical activities and exercises. The invited nurse used some integrative practices to work on topics related to the emotions and feelings of the participants. The physical therapist addressed the theme of ergonomics; in addition, he spoke of the importance of stretching and care with posture. The pharmacist discussed the medications and teas used in the components of MetS, and their interactions. Finally, the cardiologist worked on topics related to spirituality and cardiovascular disorders. The nurses who conducted the program, researchers from the Health and Quality of Life Research Group (UESB), received the same instructions and training to collaborate in the execution of the intervention. Participants in the control group did not participate in the educational program and, like the intervention group, maintained the usual care at the health center, with monthly consultation. They received a monthly phone call to confirm their participation in the study, attending the health center to meet the schedule. In addition to the scheduled measurements, there was no other type of personal contact between the researchers and the control group during the study.

Measurements All participants included in the study were evaluated at two time points, before the intervention and after six months of monitoring. The data to characterize the participants were collected at baseline through individual interviews, using a questionnaire structured in three general fields, namely: personal identification (sex, age, color, marital status, years of study and income); general aspects of health (duration of diabetes) and lifestyle (smoking and alcohol use). The level of physical activity was estimated using the International Physical Activity Questionnaire short version (IPAQ). For analysis purposes, participants were classified as physically active (active, irregularly active A and B) and sedentary. MetS was determined using the criteria of the Third Report of the National Cholesterol Education Program Expert Panel on Detection, Evaluation and Treatment of High Blood Cholesterol in Adults (NCEP-ATP III).(13) The abdominal circumference was measured at the midpoint in a horizontal plane between the iliac crest and the lower costal margin, using a flexible and inelastic tape measure with an accuracy of 0.1 cm. Weight was assessed with individuals dressed in light clothing and barefoot, on a portable digital scale (Wiso®, model W801) with a capacity of 0-180 kg and an accuracy of 0.1 kg.(18) Height was measured using a portable metal stadiometer (Sanny, capriche model), with a resolution of 0.1mm. Body mass index (BMI) was obtained using the participant's weight in kilograms divided by the square of their height in meters.(19) Blood pressure was measured with a validated semi-automatic device (Omron, model HEM-742 INT),(20) with participants in the sitting position, on the left arm, after a ten-minute rest. Systolic and diastolic pressure measurements were represented by the mean of two readings. Blood samples were in the antecubital vein, after confirmation of 12 hours of fasting, in a collection room prepared at the health center. Serum concentrations of triglycerides, HDL-c, and fasting glucose were measured by enzymatic methods (Roche Diagnostics).

Statistical analysis. We used the general project database, dated March 15, 2020. To report the data, we used mean, standard deviation, frequency and percentage. The normal distribution of data was evaluated by the Shapiro-Wilk test and analysis of homogeneity of variances by the Levene test. To compare variables at baseline between two groups (intervention and control), we used Student's T-test and Chi-square test.

All comparisons between groups were based on intent-to-treat analysis using the multiple imputation method. Anova Two-Way (time*group) for repeated measures was used to assess changes in MetS components from baseline to six-month monitoring in all participants, F and *p* values were reported. To identify the difference pairs, the Bonferroni post-hoc was adopted. All statistical analyses were performed by SPSS (version 24.0). The significance level adopted was $p<0.05$.

Ethical aspects. The ethical approval of the project "Caring for educating in the metabolic syndrome" was obtained by the Research Ethics Committee of the State University of Southwest Bahia (UESB, number CAAE 92352818.9.0000.0055, opinion: 2,850,239). All participants provided written informed consent.

Results

Table 1 details the characteristics of the participants at baseline. A total of 51 participants (26 in the intervention group and 25 in the control group) who completed the six-month study were analyzed. Overall, the participants were mostly female (86.3%), middle-aged (48.73±7.84), non-white (78.4%), with a partner (82.4%), with less than eight years of schooling (52.9%), family income of one minimum wage or more (60.8%), never smoked (66.7%) or consumed alcohol (43.1%). Participants reported that they did not practice physical activity (66.7%) and that they have been living for about one to 10 years with the diagnosis of DM2 (60.8%). Based on BMI (34.9 ± 5.9 kg/m2), participants in our study ranged from class I to class II obesity (29.4% and 27.5%, respectively).

Table 1. Baseline characteristics of the 51 study participants

Characteristics	All (*n*=51)	Intervention (*n*=26)	Control (*n*=25)
Age$_{\text{(years)}}$, mean ± SD	48.73±7.84	48.96±8.03	48.48±7.80
Sex, *n* (%)			
Male	7 (13.7)	5 (19.2)	2 (8.0)
Female	44 (86.3)	21 (80.8)	23 (92.0)
Skin Color, *n*(%)			
White	11 (21.6)	4 (15.4)	7 (28.0)
Non-white	40 (78.4)	22 (84.6)	18 (72.0)
Marital status, *n*(%)			
With partner	42 (82.4)	22 (84.6)	20 (80.0)
Without partner	9 (17.6)	4 (15.4)	5 (20.0)
Years of education, *n*(%)			
< 8 years of schooling	27 (52.9)	15 (57.7)	12 (48.0)
≥ 8 years of schooling	24 (47.1)	11 (42.3)	13 (52.0)
Income, *n*(%)			
< 1 minimum wage	20 (39.2)	12 (46.2)	8 (32.0)
≥ 1 minimum wage	31 (60.8)	14 (53.8)	17 (68.0)

Table 1. Baseline characteristics of the 51 study participants (Cont.)

Characteristics	All (*n*=51)	Intervention (*n*=26)	Control (*n*=25)
Alcoholic, *n*(%)			
Current	14 (27.5)	7 (26.9)	7 (28.0)
Old	15 (29.4)	6 (23.1)	9 (36.0)
No	22 (43.1)	13 (52.0)	9 (36.0)
Smoker, *n*(%)			
Current	3 (5.9)	2 (7.7)	1 (4.0)
Old	14 (27.5)	6 (23.1)	8 (32.0)
No	34 (66.7)	18 (6.2)	16 (64.0)
Physical activity level, *n*(%)			
Active	17 (33.3)	7 (26.9)	10 (40.0)
Sedentarism	34 (66.7)	19 (73.1)	15 (60.0)
Diabetes duration, *n*(%)			
< 1 year	9 (17.6)	3 (11.5)	6 (24.0)
1 to 10 years	31 (60.8)	19 (73.1)	12 (48.0)
≥ 10 years	11 (21.6)	4 (15.4)	7 (28.0)
Metabolic Syndrome[a]			
MetS score[a], mean ± SD	4.05±0.75	4.15±0.83	3.96±0.67
Anthropometry, mean ± SD			
Height (cm)	156.75±0.81	157.77±0.07	155.68±0.88
Weight (kg)	79.50±16.76	79.43±12.90	79.57±20.29
BMI (kg/m2)	32.33±6.08	31.86±4.38	32.81±7.53
Abdominal Circumference (cm)	105.69±12.73	107.23±9.24	104.08±15.60
Hematology, mean ± SD			
Glucose (mg/dL)	174.62±38.97	180.23±38.99	168.80±38.87
Triglycerides (mg/dL)	165.80±27.70	169.88±29.30	161.56±25.84
HDL-c (mg/dL)	42.02±10.54	39.42±9.38	44.72±11.18
Mean Arterial Pressure ± SD			
Sistolic (mmHg)	139.06±17.95	140.04±16.73	138.04±19.43
Diastolic (mmHg)	85.33±10.78	85.08±10.62	85.60±11.16

BMI: body mass index. HDL-c: high-density lipoproteins-cholesterol, MetS: metabolic syndrome, *Significantly different from baseline ($p<0.05$)

All subjects had MetS according to NCEP ATP III criteria (mean 4.05±0.75). Both groups had the values of the MetS components changed. No statistically significant difference was detected between groups. Due to the small sample size, it was decided not to perform an analysis between groups stratified by sex, although it recognizes that there are differences between genders in some variables under investigation, such as: waist circumference and HDL-c. The effects of the health promotion educational program on the five metabolic markers are presented in Table

2, from baseline to post-intervention. From the evaluation of the MetS components, a significant trend (p=0.001) of group interaction by time for glucose reduction in the intervention group (-33.89 mg/dL) can be verified when compared to the control group (34.00 mg/dL), after the intervention period. We also observed a significant increase (p=0.001) in HDL-c interaction for the intervention group (5 mg/dL) compared to the control group (-6.80 mg/dL). No other characteristic changes in MetS were statistically significant.

Table 2. Comparisons of MetS components in the control and intervention groups, pre- and post-intervention

Variables	Intervention (n = 26)		Control (n = 25)		ANOVA Time*Group		
	Pre	Post	Pre	Post	F	Right	n_p^2
Abdominal Circumference (cm)	107.23±9.24	104.15±10.28	104.08±15.60	102.60±1473	0.101	0.752	0.001
Glucose (mg/dL)	180.23±38.99	146.34±29.98	168.80±38.87	202.80±37.07	22.177	0.001*	0.185
Triglycerides (mg/dL)	163.88±29.30	165.65±36.33	161.56±25.84	164.72±29.07	0.742	0.391	0.008
HDL-c (mg/dL)	39.42±9.38	44.42±4.76	44.72±11.18	37.92±8.36	11.370	0.001*	0.106
Systolic blood pressure (mmHg)	140.03±16.73	130.23±14.65	138.04±19.43	138.56±19.34	2.190	0.142	0.022
Diastolic blood pressure, (mmHg)	85.07±10.62	83.80±9.71	85.60±11.16	85.36±11.69	0.058	0.811	0.001

HDL-c: high-density lipoproteins-cholesterol, *Significantly different from baseline ($p<0.05$)

Figure 2 shows the MetS criteria score at baseline and post-intervention. It can be seen that the MetS score revealed a significant interaction effect (p=0.033; F= 4.677; n_p^2=0.046, Figure 2A) to reduce the mean in the intervention group after the intervention (4.15±0.83 vs. 3.61±0.98), which was not verified in the control group (3.96±0.67 vs. 4.12±0.72) following a trend of increasing the score. It was also found a significant difference in the mean variation of reduction between groups (Δ=-0.53±1.13 intervention group vs. 0.16±0.74 control group, p=0.013; Figure 2B). At the end of the study, it was observed that only 11.5% (n=3) of the participants no longer met the MetS criteria.

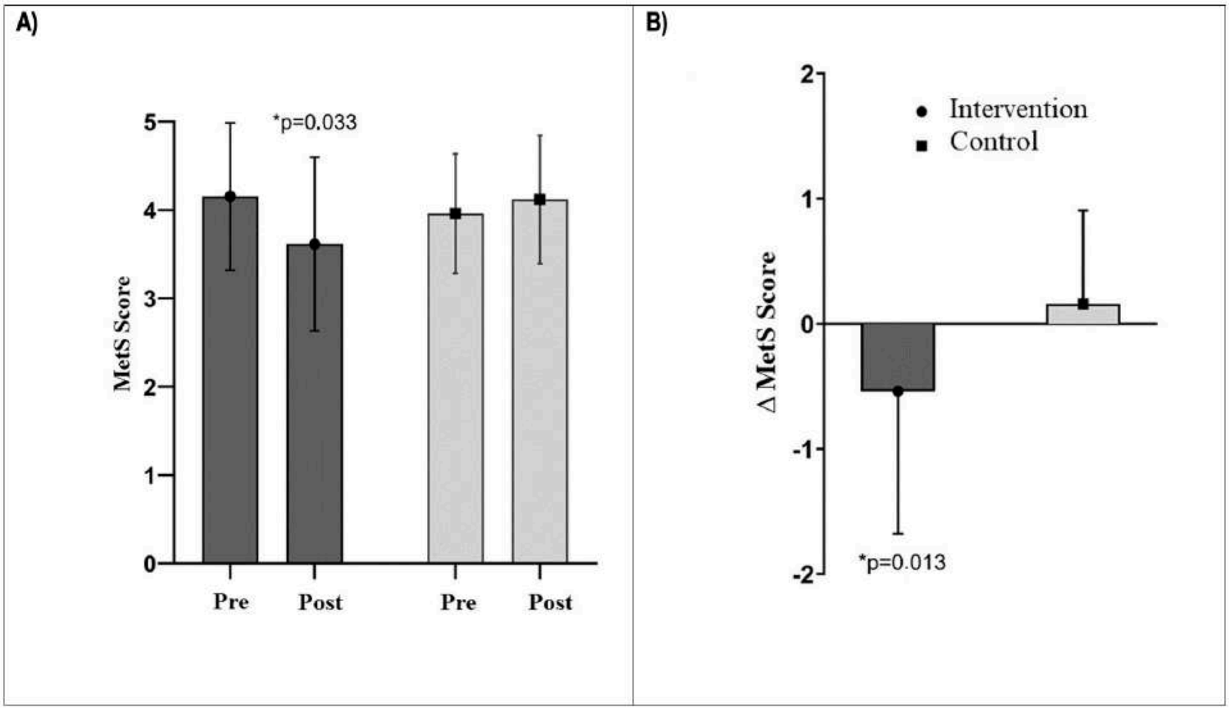

Figure 2. MetS criteria score at baseline and post-intervention

Discussion

This study demonstrated the effectiveness of a multidisciplinary educational intervention program in lifestyle to reduce glucose levels and increase HDL-c concentrations in adults with DM and MetS with low educational level (< 8 years) after six months of implementation, being one of the few interventions led by nurses to promote health in the context of primary health care for the management of MetS. These results are parallel to those of some of the previous studies.(12,21) The participation rate in the intervention program was 72.9%, which is a positive indication of its feasibility in clinical practice of a guided lifestyle intervention, which may lead to further improvements in MetS indicators over time. The characteristics of the participants were consistent with previous findings among the adult population with MetS and DM2.(8,12) The participants, for the most part, reported that they did not practice physical activity and presented important changes in the MetS markers. Therefore, baseline data indicated the urgent needs for health promotion interventions in this high metabolic risk population. Interestingly, at the end of the study, most participants in the intervention group (in relation to the control group) reported practicing at least 150 minutes of physical activity per week (n=20, 60.6% vs n=13, 39.4%; Δ=+21.2%).

It is important to highlight the presence and leadership capacity of nursing in terms of coordination and monitoring of the intervention program. Above all, from a multidisciplinary approach perspective, which has been reported as an essential feature in intervention programs aimed at MetS in primary health care.(12) Our research team was concerned with understanding not only the clinical conditions of the participants, but also the aspects of their socio-cultural reality.

During the workshops, program professionals acted as support in the care process and provided information to control and improve their MetS clinical condition. Therefore, individuals who received the intervention were stimulated for self-care capacity and to improve knowledge of MetS and its risk factors, as demonstrated in one of our studies.(4) It is also interesting to highlight, in this regard, the presence of nurses who were competent to provide health education on MetS to a majority of people with a low level of education and health knowledge.

The present study indicated a trend of mean reduction in the MetS criteria score after receiving six months of intervention. And the results indicate that regardless of weight loss, lifestyle intervention caused a reduction in mean blood glucose and an increase in HDL-c. However, participants in the control group showed an increase in the mean levels of MetS components from baseline to study completion. A community-based lifestyle intervention study observed a reduction in the prevalence of MetS in overweight women after 16 weeks of intervention of a diabetes prevention program, as well as being able to cause improvements in fasting glucose and HDL-c in those who had high blood glucose and low HDL-c at the beginning of the study.(8) Similarly, other similar studies have also demonstrated significant changes in the total number of MetS components and increased the frequency of individuals achieving resolution of the syndrome.(12,22) One program, led by nurses, found a significant reduction in the diagnosis of MetS in the short term by 48.1% (six months) and in the medium term by 83.8% (12 months) in the participants who participated in an interdisciplinary approach intervention with stimulation for physical activity, cognitive behavioral therapy, clinical and nutritional guidance, carried out in a community health center. In contrast to our findings, HDL-c levels increased at 6 and 12 months compared to baseline. Therefore, this finding corroborates a possible cardioprotective effect with the increase in HDL-c levels in those who adhered to the educational intervention program in MetS.(12) This cardioprotective effect was also found by Chang *et al*.,(23) they observed an increase in HDL-c levels of 2.34 mg/dL at six months. In addition, normalization of glucose metabolism and associated risk factors is crucial for reducing the risk of cardiovascular disease.(24) In our study, on mean, fasting glucose was reduced by 33.89 mg/dL from baseline to the end of the study in the intervention group. It is then suggested that lifestyle modifications may have played a role in lowering blood glucose. This improvement in glycemic profile was similar to previous studies.(12,21) For example, fasting glucose was significantly reduced in the group that participated in a lifestyle modification program, with a significant decrease in the prevalence of hyperglycemia in 38.4% of cases.(21)

These metabolic benefits are likely to end up not only resulting in a lower incidence of MetS, but also reducing cardiovascular events in these patients with DM and MetS. This result, which is in line with the improvement in MetS criteria, may also reflect an important reduction in cardiovascular risk. It was found that the results obtained coincide with other studies that show the effectiveness of health education for cardiometabolic health.(21,24) It has been shown in the literature that the risk of developing complications among adults with T2DM was significantly lower in those participants who decreased glucose levels.(25) Interestingly, another study demonstrated that the risk remained significantly reduced, even if the reversion to normal glucose levels was only transient.(24)

In a current study, participants were encouraged to incorporate regular physical activity and healthier eating habits with recommendations for self-management of daily fat and calorie intake.(4) Other evidence also highlights the benefits of these recommendations for improving the chances of getting rid of MetS.(8,26) Thus, a possible explanation may be due to the changes that the participants themselves underwent towards a healthy lifestyle, which agrees with a study that reported that the therapeutic approach to lifestyle can benefit an improvement in glycemia and HDL-c.(7,8,11) However, we cannot say whether the participants decreased their caloric intake in relation to baseline values. Physical activity is widely described in the literature as one of the main protective factors against various chronic diseases, including T2DM and MetS(6) Indeed, a meta-analysis showed that regular practice of physical activity, both supervised and unsupervised, could decrease serum glucose levels among patients with T2DM.(25,27) It has also been associated with improvements in the anti-inflammatory properties of HDL-c.(28) Elevated HDL-c levels have been linked to lower risks of cardiovascular disease.(28) In agreement with the present study, a previous study demonstrated improvement in HDL-c after a change in lifestyle.(12) However, even with improvements in blood glucose and HDL-c levels, the values still remained altered at the end of the study according to the definitions of NCEP-ATP III. Thus, it is suggested that studies be carried out with longer duration and monitoring. On the other hand, this improvement, even if still at altered levels, is important in relation to the efficiency of the intervention program. Since a cross-sectional study, it was observed that women with diabetes were more likely to have obesity and reduced HDL-c levels.(3)

On the other hand, although there was only a modest increase in HDL-c from baseline to the end of the study (at six months), the results of the analysis suggested that the control group experienced a reduction in HDL-c. In addition, regardless of the magnitude of the reduction, the existing evidence was consistent with the present study in terms of changes in HDL-c(12) For example, in the study by Rodríguez *et al.*(7) an educational intervention was carried out with women (*n*= 230, 53.16±4.30 years of age) from two health centers, who were premenopausal and with at least one cardiovascular risk factor. After one-year monitoring, women in the intervention group had better HDL-c and glucose levels compared to women in the control group. The consequences of these interactions contributed significantly to a decrease in the occurrence of MetS and, inevitably, to a decrease in the risk of CVD. On the other hand, no significant effects of the intervention on waist circumference, triglycerides and blood pressure were observed. Although the changes were not significant, blood pressure and waist circumference improved somewhat during the intervention period. To observe significant effects on these variables, an intervention period longer than the six months performed in the present study may be necessary. Further studies are needed to determine whether such effects can be observed for a longer period.

These results show that the prevention of the components of MetS in adults with T2DM is an important activity to be carried out by health professionals within the scope of primary health care and that the adult population seems to be receptive to these initiatives. In the specific case of adults with multimorbidities, the need for preventive actions becomes much more evident, given the greater possibility of developing CVD. Especially when one observes the trend of increasing prevalence of T2DM and MetS in the adult Brazilian population in general and particularly in women.(3) Therefore, this evidence suggests that the implementation of intervention programs to improve evidence-based lifestyle at the primary health care level may attenuate the progression of MetS and, consequently, the long-term burden of chronic diseases.

However, we believe that the results of this study, although incipient, emphasize the value of health promotion aimed at the management of MetS and contribute as evidence to support future policies that require a greater focus on prevention in primary care of the adult population at cardiometabolic risk. Thus, this study highlights the clinical value of an educational program for MetS, with seven group workshops versus the usual care in a public health center for diabetic adults with MetS. Especially, considering the predominance of women in the study, as well as the age group they are in, it is worth noting that several studies demonstrate that the cessation of menstruation causes an increased cardiovascular risk in women, due to the deficiency of estrogen, a cardioprotective hormone. In addition, in this phase, metabolic changes occur, such as increased blood pressure, triglycerides and decreased HDL-c. (7) On the other hand, among the limitations, we must highlight that the main limitation of this study was the small sample size and lack of randomization of participants to the intervention or control group. However, random distribution was unfeasible due to the specificity of the eligibility criteria, as well as the participants' own family and professional needs. Blinding was also not possible, since all participants belong to the same community and the same health center. In any case, this approach seems to be important, as it reflects the real-life condition of users in the health system. However, it may limit the generalization of the results and, therefore, more studies are needed to consider these aspects. The intervention period was limited (six months). We believe that determining the effectiveness of the intervention over a longer period and including more health centers would be necessary. In addition, our overall results are clinically significant and certainly support the role of lifestyle interventions in diabetic individuals with MetS, under nursing monitoring and by specialists for six months.

Therefore, the findings of this study can be used to support the application of evidence in community-level public health programs to improve glucose and HLD-c in adults, especially women, with DM and MetS. This finding is relevant, as there is a need to consolidate the implementation of educational programs for intervention in MetS at the level of primary health care. Thus, we suggest that programs to encourage healthier lifestyle habits that include an interdisciplinary approach with nursing leadership should be promoted with the population as a way to improve the lipid profile and prevent or reverse insulin resistance, as well as prevent chronic diseases. These findings highlight the importance of nursing leadership in the context of primary health care in the management of MetS and T2DM. The involvement of nurses in educational programs for these conditions demonstrates their ability to lead interventions and identify early diagnostic criteria for MetS.(29) The promotion of self-care and adherence to lifestyle changes, such as the practice of physical activity and the adoption of healthy eating habits, are reinforced by health education, regardless of the level of education of the participants. Thus, nursing plays an important role in the prevention and progression of both MetS and T2DM. (30)

Although longer monitoring periods are needed for a more robust assessment, the results of this study reinforce the importance of patient-centered care strategies, with a focus on early screening, ongoing monitoring, and educational interventions. Nursing participation is essential in the multidisciplinary care of adults with MetS and T2DM, contributing to reduce the burden of chronic diseases in vulnerable populations. The role of nurses in educational interventions is essential to promote adherence to lifestyle changes. In addition, multidisciplinary interventions, especially in individuals with multimorbidities, have a better prognosis when there is joint planning among health professionals. Therefore, the development of actions by nursing in primary health care promotes the prevention of chronic conditions and improves the quality of life of these people, who are often unaware of MetS and face challenges in the management of T2DM.(30) The great contribution of this study to nursing as a science lies in demonstrating its essential role in health promotion and in the management of chronic conditions, such as MetS and T2DM. By integrating technical knowledge, intervention planning and health education nursing is consolidated as a scientific discipline capable of leading effective care strategies, directly impacting the strengthening of public health practices.

Conclusion. The intervention of an educational program led by nurses, to promote health in lifestyle caused a reduction in fasting blood glucose and improved HDL-c concentrations in adults with DM and MetS with low educational level, after six months of group intervention. Our findings suggest that the investigated program may have a significant impact in reducing the number of MetS components in the context of primary health care.

Funding: Research grant funded by the Research Support Foundation of the State of Bahia (FAPESP, process number BOL0549/2019).

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Determining the impact of a self-care educational program designed based on the Peplau theory on adherence to treatment and self-care in elderly patients with diabetes

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Conflicts of interest: No

Received: July 22, 2024.

Approved: December 9, 2024.

How to cite this article: Abkenar MR, Imani E, Teshnizi SH, Ahmadi NS, Moradi Y. Determining the impact of a self-care educational program designed based on the Peplau theory on adherence to treatment and self-care in elderly patients with diabetes. Investigación y Educación en Enfermería. 2025; 43(1):e05.

DOI: https://doi.org/10.17533/udea.iee.v43n1e05

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Impact of a self-care educational program designed based on the Peplau theory on adherence to treatment and self-care in elderly patients with diabetes

Abstract

Objective. To examine the impact of a self-care program designed using Peplau's theory on adherence and self-care in elderly diabetic patients. **Methods.** This semi-experimental study involved 102 elderly diabetic patients from a diabetes clinic in Hormoz, Iran, in 2023. Participants were randomly allocated to either the control group (n=51) or the intervention group (n=51). Before and two weeks after the intervention, participants completed a demographic information questionnaire, the Modanloo Adherence to Treatment Questionnaire for Patients with Chronic Illness, and the Summary of Diabetes Self-Care Activities Scale. The intervention group received a self-care educational program based on Peplau's therapeutic communication theory, delivered in three phases: orientation, working, and termination. The program focused on key diabetes self-care factors including diet, medication adherence, physical activity, blood sugar monitoring, and foot care. Educational sessions were conducted in small groups or individually in the clinic's education room. The control group received routine educational content provided by the diabetes clinic. **Results.** The findings showed that the difference between the pre-post mean scores was significantly higher in the intervention group compared with the control group in the total self-care score, as well as in its dimensions: diet, blood sugar regulation, and foot care ($p<0.001$). On the other hand, in terms of adherence, no significant difference was observed in the mean difference between groups for the total score (p=0.307), although a statistical difference was found in the dimensions of willingness to participate in treatment (p=0.035) and ability to adapt ($p<0.001$). **Conclusion.** The self-care educational program based on Peplau's theory improved the self-care and two dimensions of the adherence: willingness to participate in treatment and ability to adapt in diabetic patients.

Descriptors: Diabetes Mellitus; self care; treatment adherence and compliance; aged; control groups.

Impacto de un programa educativo de autocuidado diseñado a partir de la teoría de Peplau sobre la adherencia al tratamiento y el autocuidado en pacientes ancianos con diabetes

Resumen

Objetivo. Examinar el impacto de un programa de autocuidado diseñado a partir de la teoría de Peplau sobre la adherencia al tratamiento y el autocuidado en pacientes ancianos diabéticos. **Métodos**. Estudio experimental en el que participaron 102 pacientes diabéticos de edad avanzada de una clínica de diabetes de Hormoz, Irán, en 2023. Los participantes fueron asignados aleatoriamente al grupo de control (n=51) o al grupo de intervención (n=51). Antes y dos semanas después de la intervención, los participantes completaron un cuestionario de información demográfica, el Cuestionario Modanloo de Adherencia al Tratamiento para Pacientes con Enfermedades Crónicas y la Escala abreviada de Actividades de Autocuidado de la Diabetes. El grupo de intervención recibió un programa educativo de autocuidado basado en la teoría de la comunicación terapéutica de Peplau, impartido en tres fases: orientación, trabajo y finalización. El programa se centró en factores clave del autocuidado de la diabetes, como la dieta, el cumplimiento de la medicación, la actividad física, la monitorización de la glucemia y el cuidado de los pies. Las sesiones educativas se llevaron a cabo en pequeños grupos o individualmente en la sala de educación de la clínica. El grupo de control recibió contenidos educativos rutinarios proporcionados por la clínica de diabetes. **Resultados.** Los resultados mostraron que la diferencia entre las puntuaciones medias pre-post fue significativamente mayor en el grupo de intervención en comparación con el grupo de control en la puntuación total de autocuidado, así como en sus dimensiones: dieta, regulación de la glucemia y cuidado de los pies ($p<0.001$). Por otro lado, en cuanto a la adherencia, no se observaron diferencias significativas entre las medias entre grupos para la puntuación total ($p=0.307$), aunque sí se encontró una diferencia estadística en las dimensiones de disposición a participar en el tratamiento ($p=0.035$) y capacidad de adaptación ($p<0.001$). **Conclusión.** El programa educativo de autocuidado basado en la teoría de Peplau mejoró el autocuidado y dos dimensiones de la adherencia: la voluntad de participar en el tratamiento y la capacidad de adaptación en pacientes diabéticos.

Descriptores: Diabetes Mellitus; autocuidado; cumplimiento y adherencia al tratamiento; anciano; grupos control.

Impacto de um programa educacional de autocuidado elaborado com base na teoria de Peplau na adesão ao tratamento e autocuidado em idosos com diabetes

Resumo

Objetivo. Examinar o impacto de um programa de autocuidado desenvolvido com base na teoria de Peplau na adesão ao tratamento e no autocuidado em pacientes idosos diabéticos. **Métodos.** Estudo experimental envolvendo 102 pacientes diabéticos idosos de uma clínica de diabetes em Hormoz, Irã, em 2023. Os participantes foram aleatoriamente designados para o grupo de controle ($n=51$) ou o grupo de intervenção ($n=51$). Antes e duas semanas após a intervenção, os participantes preencheram um questionário de informações demográficas, o Questionário Modanloo de Adesão ao Tratamento para Pacientes com Doenças Crônicas e a Escala Abreviada de Atividades de Autocuidado com Diabetes. O grupo de intervenção recebeu um programa educacional de autocuidado baseado na teoria da comunicação terapêutica de Peplau, ministrado em três fases: orientação, trabalho e conclusão. O programa se concentrou em fatores-chave do autocuidado do diabetes, como dieta, adesão à medicação, atividade física, monitoramento da glicemia e cuidados com os pés. As sessões educacionais foram conduzidas em pequenos grupos ou individualmente na sala de educação da clínica. O grupo de controle recebeu conteúdo educacional de rotina fornecido pela clínica de diabetes. **Resultados.** Os resultados mostraram que a diferença entre as médias das pontuações pré-pós foi significativamente maior no grupo intervenção em comparação ao grupo controle no escore total de autocuidado, bem como em suas dimensões: dieta, regulação da glicemia e cuidados com os pés ($p<0.001$). Por outro lado, em relação à adesão, não foram observadas diferenças significativas entre as médias entre os grupos para o escore total ($p=0.307$), embora tenha sido encontrada diferença estatística nas dimensões disposição para participar do tratamento ($p=0.035$) e adaptabilidade ($p<0.001$). **Conclusão.** O programa educacional de autocuidado baseado na teoria de Peplau melhorou o autocuidado e duas dimensões de adesão: disposição para participar do tratamento e adaptabilidade em pacientes diabéticos.

Descritores: Diabetes Mellitus; autocuidado; cooperação e adesão ao tratamento; idoso; grupos controle.

Introduction

The global population is rapidly aging.(1) Currently, approximately 600 million people worldwide are aged 60 and over, and this number is expected to reach 2 billion by 2050. According to projections by the United Nations, it is anticipated that by 2025, 10.5% of the population in Iran will be over 60 years old, and this figure is expected to increase to 21.7% by 2050.(2) Although aging itself is not considered a disease, the physiological changes associated with aging increase the likelihood of developing diseases. In the elderly, the epidemiological pattern of diseases has shifted towards a higher prevalence of chronic diseases.(3) Diabetes is one of the common chronic diseases among the elderly, requiring special attention and management.(4) A study with over 1.3 million participants found that 98% of adults with type 2 diabetes have at least one accompanying chronic condition, and nearly 90% have at least two.(5) Additionally, a study in Iran revealed that the prevalence of diabetes among individuals over 60 years old was 29.03%.(6) This disease can lead to serious problems and complications, including an increased risk of cardiovascular diseases, kidney damage, and vision problems in the elderly. People with diabetes may have poor self-care behaviors; therefore, identifying barriers to self-care is also a crucial step in improving or enhancing self-care behaviors.(7) Self-care is an active and practical process managed by the patient, aiming to monitor medication treatment and use medications appropriately, follow a healthy diet, exercise, care for the feet, prevent diabetic wounds, and control blood glucose levels.(8) Studies have shown that self-care behaviors in diabetic patients are at a low level, and individuals with less ability to care for themselves are at greater risk of developing diabetic complications. In elderly patients with diabetes, neglecting self-care leads to poor treatment adherence and an increased risk of serious complications.(9)

Non-adherence to treatment regimens in diabetic patients is associated with frequent hospitalizations, failure to receive therapeutic benefits, high treatment costs, and a large number of physician visits. The mortality rate in patients who do not adhere to their treatments is twice as high as in those who do.(10) According to the World Health Organization, adherence refers to the extent to which an individual's behavior—such as taking medication, following a diet, or implementing lifestyle changes—corresponds with the recommendations provided by healthcare personnel.(11) Some studies have shown that 4 to 31 percent of diabetic patients never proceed to obtain the prescribed medications, and some refrain from using them after obtaining their prescriptions to the extent that 30 to 50 percent of diabetic patients refrain from using blood pressure and lipid-lowering medications, which play an important role in reducing cardiovascular events, during the first three months of drug therapy.(12) In this regard, nurses play an important role in encouraging patients to participate in the self-care process and adhere to treatment.(13)

Nrsing theories are considered essential for guiding nurses to advance the nursing profession and provide standard care. From Peplau's nursing theory perspective, nurses have various roles, including educator, counselor, patient advocate, facilitator, and source of information, all of which require appropriate patient communication for proper execution, based on the circumstances.(14) Peplau's theory emphasizes the importance of interpersonal communication between the nurse and patient as a central component of effective care. According to Peplau, interpersonal communication occurs in phases: orientation, identification, exploitation, and resolution. These phases allow nurses to establish a relationship with the patient, understand their needs, provide education, and guide them through their treatment process. By utilizing these communication techniques, nurses can help patients navigate their concerns, reduce anxiety, and encourage active participation in their care.(15) In the context of diabetes management, effective communication is crucial in motivating patients to adopt self-care behaviors and adhere to treatment regimens. Interpersonal communication allows nurses to understand the individual needs and concerns of elderly diabetic patients, tailoring interventions that address barriers to self-care and treatment adherence.

Since Peplau's theory introduces a clear framework for effective communication during nursing care, it can be used to provide patients with the most effective education and involve them actively in the education process.(16) Considering the limited number of diabetes centers and associations in Iran and the difficulty in accessing them for the elderly living in rural areas, self-care education and self-care levels in these patients are low. Currently, patients receive necessary training through educational pamphlets and face-to-face interactions in a short period, with insufficient attention to their educational needs, expectations, knowledge levels, and understanding. Disorders in self-care and treatment adherence can directly affect the quality of life of elderly diabetic patients. Therefore, this research was designed to determine the impact of a self-care educational program based on Peplau's theory on treatment adherence and self-care in elderly diabetic patients.

Methods

Study Design. This was a semi-experimental, parallel-group study conducted at the Diabetes Specialty Clinic in Hormoz, Iran, in 2023. (Figure 1). The study was designed to evaluate the effect of a self-care educational program based on Peplau's theory of therapeutic communication on adherence to treatment and self-care among elderly diabetic patients. Ethical approval was obtained from the relevant institutional review board, and all participants provided informed consent before enrollment.

Participants. The study included elderly patients aged 65 years or older with a confirmed diagnosis of diabetes by an internal medicine specialist, residing in Bandar Abbas, and undergoing treatment with either oral medication or insulin for at least one year. Participants were required to demonstrate the ability to perform self-care activities independently and have no significant auditory or visual impairments. Exclusion criteria included withdrawal from the study, deterioration in health (e.g., impaired consciousness or death), or any change in condition that affected the ability to communicate.

Sample Size. Sample size calculations were based on mean self-care scores reported by Markel-Reed et al. (2018). Using a confidence level of 95% ($Z = 1.96$), a power of 80% ($Z = 0.84$), and expected means and standard deviations ($\mu 1 = 42.83$, $\mu 2 = 37.86$; $S1 = 8.52$, $S2 = 11.33$), a sample size of 51 participants per group was determined. Calculations were performed using WinPepi software (version 11.65).

Randomization. Participants were allocated to either the intervention or control group using block randomization with 17 six-unit blocks generated by Randomization Main software. This ensured equal distribution ac.

Interventions. The control group received routine education provided by the diabetes clinic. The intervention group participated in a self-care educational program based on Peplau's theory of therapeutic communication, delivered in three phases: orientation, working, and termination. Educational sessions were held face-to-face in small groups (maximum of two participants) or individually in the clinic's education room. The phases of the intervention were: (i) *Orientation:* Two sessions (20–30 minutes each) were conducted over two weeks. The first session focused on rapport-building and explaining the study purpose, while the second addressed patients' strengths and challenges; (ii) *Working:* Two sessions (20–30 minutes each) were held one week apart, covering topics such as diet, medication adherence, physical activity, blood sugar measurement, and foot care using educational brochures and video clips; (iii) *Termination Phase:* Two sessions (20–30 minutes each) were held one week apart. In the first session, participants' questions were addressed, and the second session facilitated group discussions to share experiences and reinforce learning. Educational content was derived from the "Healthy Lifestyle Volume 3" handbook by the Ministry of Health, tailored to elderly patients. To accommodate participants' needs, session schedules were coordinated via telephone, and companions were allowed to attend.

Outcomes. The primary outcomes were self-care ability and adherence to treatment. These were assessed using: (i) *Modanloo Adherence to Treatment Questionnaire:*(17) A 40-item validated tool measuring adherence across seven domains. Scores were categorized as very good (75–100%), good (50–74%), average (26–49%), and weak (0–25%); (ii) *Summary of Diabetes Self-Care Activities (SDSCA) Scale:*(18) A 15-item scale assessing self-care behaviors, with scores categorized as good (76–100), moderate (51–75), and poor (≤50). Reliability was confirmed via Cronbach's alpha for adherence (α = 0.736) and self-care (α = 0.811).

Data Collection and Analysis. Baseline demographic and clinical data were collected via structured interviews. Questionnaires were administered pre- and post-intervention by a researcher blinded to group allocation. Post-tests were conducted two months after the intervention. Data analysis was performed using SPSS (version 26.0): (a) Between-group differences were analyzed using independent t-tests or Mann-Whitney U tests (for non-normal distributions); (b) Within-group differences were assessed using paired t-tests or Wilcoxon tests; (c) Relationships between demographic/clinical variables and outcome changes were explored using Pearson correlation, ANOVA, and independent t-tests. A p-value of <0.05 was considered statistically significant for all analyses.

Ethical Issues. This study was conducted in accordance with ethical principles outlined in the Declaration of Helsinki. Ethical approval was obtained from the Iran National Committee for Ethics in Biomedical Research (Approval Number: IR.HUMS.REC.1402.033). Written informed consent was obtained from all participants prior to their enrollment, ensuring voluntary participation and understanding of the study's purpose and procedures. The confidentiality and anonymity of participants were strictly maintained, with all data being de-identified and securely stored. Participants were informed of their right to withdraw from the study at any time without any consequences. Additionally, the educational intervention posed no harm and was designed in alignment with standard care practices. The study adhered to the ethical guidelines set by the Iran National Committee for Ethics in Biomedical Research, and all potential conflicts of interest were transparently disclosed.

Results

The results of comparing the frequency distribution of demographic characteristics of the two intervention and control groups along with the results of the chi-square test in Table 1 indicated that the frequency distribution of variables in the two intervention and control groups did not have a statistically significant difference ($p > 0.05$).

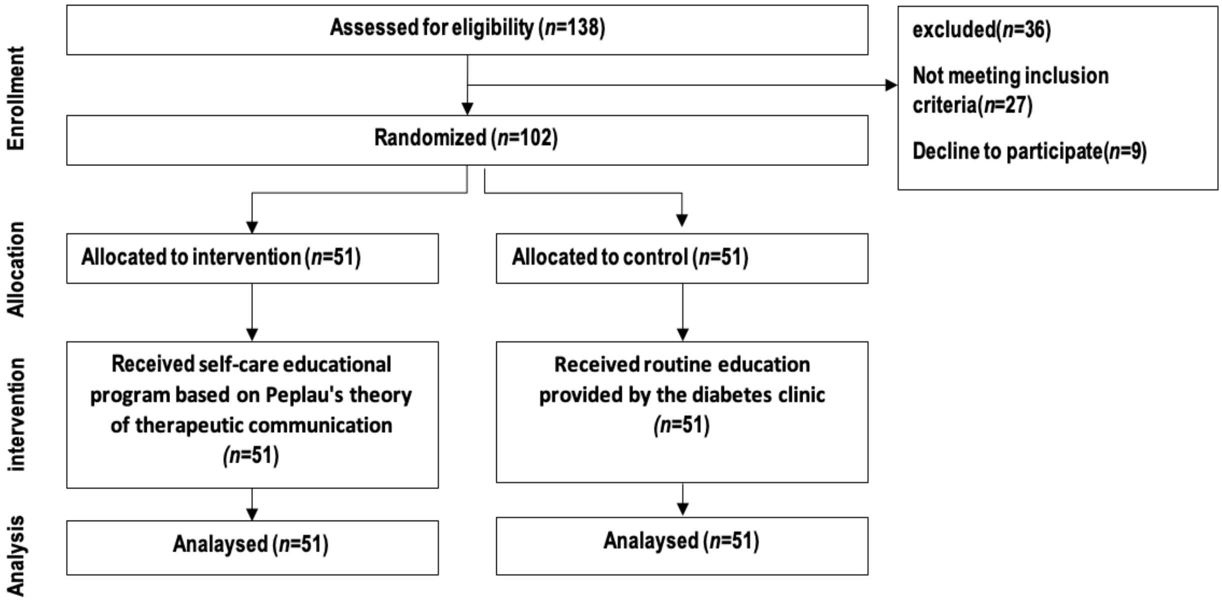

Figure 1. Flow diagram of the progress through the phases of a parallel randomised trial of two group

Table 1. Demographic variables of patients with type 2 diabetes divided into two study groups

Variables	Categories	Intervention (*n*=51)	Control (*n*=51)	*p*-value
		n (%)	*n* (%)	
Gender	Male	28 (45.1)	31 (39.22)	0.547
	Female	23 (54.9)	20 (60.78)	
Marital status	Single	15 (29.41)	12 (23.53)	0.501
	Married	36 (70.59)	39 (76.47)	
Duration of diabetes	1 to 2 years	16 (68.63)	12 (76.47)	0.375
	More than 2 years	35 (31.37)	39 (23.53)	
Medical history	Yes	40 (21.57)	43 (15.69)	0.445
	No	11 (78.43)	8 (84.31)	

Table 1. Demographic variables of patients with type 2 diabetes divided into two study groups (Cont.)

Variables	Categories	Intervention (n=51)	Control (n=51)	p-value
		n (%)	*n* (%)	
Level of education	Illiterate	29 (56.86)	28 (54.9)	0.676
	Primary	10 (19.61)	9 (17.65)	
	diploma	12 (23.53)	14 (27.45)	
Employment status	Employee	20 (39.22)	21 (41.18)	0.542
	Unemployed	10 (19.61)	6 (11.76)	
	Retired	21 (41.18)	24 (47.06)	
Place of residence	City	31 (60.78)	37 (72.55)	0.208
	Village	20 (39.22)	14 (27.45)	
Family composition	Alone	10 (19.61)	10 (19.61)	0.912
	With spouse	25 (49.02)	28 (54.9)	
	With spouse and children	14 (27.45)	11 (21.57)	
	Other	2 (3.92)	2 (3.92)	
Family history of diabetes	Yes	38 (74.51)	44 (86.27)	0.135
	No	13 (25.49)	7 (13.73)	
Tobacco use	Yes	19 (37.25)	14 (27.45)	0.290
	No	32 (62.75)	37 (72.55)	
Tobacco type	None	33 (64.71)	37 (72.55)	0.510
	Cigarettes	5 (9.8)	8 (15.69)	
	Pip	7 (13.73)	0 (0)	
	Hookah	6 (11.76)	6 (11.76)	
	Age (mean±SD)	3.93±69.55	6.65±70.65	0.346

As depicted in Table 2, significant improvements in the dietary regimen ($p<0.001$) physical activity ($p<0.001$), blood sugar regulation ($p<0.001$), regular medication intake ($p=0.047$), and foot care ($p<0.001$) compared to before the intervention was observed. However, no significant differences were observed in smoking ($p=1.0$) and physical activity ($p=0.192$) dimensions between the average changes before and after the intervention in the two groups ($p>0.05$). Additionally, independent t-test results indicated a significantly higher mean self-care score among elderly individuals with diabetes after the intervention compared to before the intervention ($p<0.001$). Moreover, the mean changes (increases) in the total self-care score for the intervention group were significantly higher than the control group (4.3 vs 0.02; $p<0.001$). Based on questionnaire scoring, the level of self-care of the study participants was evaluated as average before and after the intervention (self-care score less than or equal to 50).

Table 2. Comparison of mean self-care and its dimensions before and after the intervention phase by groups

Variables	Groups	Before intervention	After intervention	Difference before and after	Pre-and post-comparison test	
					Statistics	p-value
Diet	Intervention	18.61±7.81	24.94±3.72	6.33+8.26	-4.80	0.001>†
	Control	19.12±8.11	19.31±7.94	0.2+0.98	-1.41	†0.16
Independent two-group comparison test*		0.772	0.001>	0.001>		
Physical activity	Intervention	2.69±2.15	2.69±2.16	0.0+0.2	1.00	0.001>‡
	Control	2.84±2.19	2.75±2.08	-0.11+0.46	-1.51	0.13‡
Independent two-group comparison test*		0.772	0.834	0.192		
Blood sugar regulation	Intervention	3.16±2.49	6.25±2.31	3.1+2.08	-5.87	0.001>‡
	Control	3.08±2.34	3.12±2.33	0.04+0.2	-1.41	0.16‡
Independent two-group comparison test*		0.911	0.001>	0.001>		
Regular use of medication	Intervention	6.35±1.88	6.41±1.72	0.06+0.31	-1.34	0.180‡
	Control	6.55±1.59	6.51±1.67	-0.04+0.2	-1.41	0.16‡
Independent two-group comparison test*		0.743	0.978	0.047		
Foot care	Intervention	4.51±5.34	7.98±4.99	3.47+2.56	-5.72	0.001>‡
	Control	4.55±5.66	4.61±5.63	0.06+0.31	-1.34	0.18‡
Independent two-group comparison test*		0.786	0.001>	0.001>		
Smoking	Intervention	0.88±0.32	0.88±0.33	0.00	0.00	1.000‡
	Control	0.86±0.34	0.86±0.34	0.00	0.00	1.000‡
Independent two-group comparison test*		0.768	0.768	00.1		
Self-care (total)	Intervention	41.37±8.24	49.1±7.71	7.73+7.39	7.47	0.001>
	Control	37.14±11.30	37.16±11.40	0.02+0.58	0.240	†0.811
Independent two-group comparison test^		0.204	0.033	0.001>		

†Paired t-test, ‡Wilcoxon test, ^ Independent t-test, *Mann-Whitney U test

The results showed that the difference between the pre-post mean scores was significantly higher in the intervention group compared with the control group in the total self-care score, as well as in its dimensions: diet, blood sugar regulation, and foot care ($p<0.001$). On the other hand, in terms of adherence, no significant difference was observed in the mean difference for the total score ($p=0.307$), although a statistical difference was found in the dimensions of willingness to participate in treatment ($p=0.035$) and ability to adapt ($p<0.001$).

The results of the independent t-test, depicted in Table 3, showed that the mean total score adherence to treatment in the elderly diabetic intervention group, before intervention and after intervention, did not have a statistically significant difference ($p=0.58$). Also, the Wilcoxon test results showed no statistically significant difference in the total questionnaire score difference between the two groups ($p=0.58$, -0.43 vs 0.06). For dimensions of willingness to participate in treatment ($p=0.035$), doubt in treatment implementation ($p=0.012$), and ability to adapt ($p=0.001$) in the current study, willingness to participate in treatment, doubt in treatment implementation, and ability to adapt after intervention in the intervention group were higher than the control group. No other dimensions showed a significant difference between the average changes in both groups before and after the intervention ($p>0.05$). Considering the scoring of adherence to the treatment questionnaire in this study, individuals who scored more than 50% (66% of individuals) were classified as individuals with a good level of treatment adherence.

Table 3. Comparison of mean adherence to treatment and its dimensions before and after intervention separately in two groups

Variables	Groups	Before intervention	After intervention	Difference before and after	Pre-and post-comparison test	
					Statistics	p-value
Interest in treatment	Intervention	22.37±2.32	22.41±2.29	0.04+2.78	-0.43	0.67‡
	Control	20.29±2.73	20.35±2.7	0.06+0.24	-1.73	0.08‡
Independent two-group comparison test*		0.001>	0.001>	0.70		
Willingness to participate in treatment	Intervention	22.24±2.28	22.41±2.29	0.18+0.65	-1.91	0.06‡
	Control	20.29±2.73	20.33±2.72	0.04+0.2	-1.41	0.16‡
Independent two-group comparison test*		0.001>	0.001>	0.350		
Ability to adapt	Intervention	15.16±2.03	15.95±2.7	0.79+3.17	-2.63	0.001>‡
	Control	14.94±2.99	14.84±3.02	-0.1+0.41	-1.63	0.10‡
Independent two-group comparison test*		0.566	0.001>	0.001>		
Integration of treatment with life	Intervention	24.98±0.14	25±0	0.02+0.14	-1.00	0.32‡
	Control	24.84±0.78	24.71±0.92	-0.14+0.53	-1.84	0.07‡
Independent two-group comparison test*		0.515	0.048	0.166		
Adherence to treatment	Intervention	14.35±4.06	14.25±4.17	0.1+0.94-	-1.89	0.06‡
	Control	14.51±4.34	14.61±4.15	0.1+0.36	-0.98	0.33‡
Independent two-group comparison test*		0.681	0.765	0.316		
Commitment to treatment	Intervention	20.16±2.72	20.27±2.67	0.12+0.55	-1.51	0.13‡
	Control	20.98±2.29	21.04±2.25	0.06+0.31	-1.34	0.18‡
Independent two-group comparison test*		0.04	0.011	0.058		
Doubts in treatment implementation	Intervention	12.51±1.73	12.69±1.82	0.18+0.84	-1.37	0.17‡
	Control	12.41±1.88	12.49±1.87	0.08+0.34	-1.63	0.10‡
Independent two-group comparison test*		0.515	0.777	0.012		
Adherence to treatment (total)	Intervention	131.77±7.46	132.2±7.7	0.43+9.14	0.28-	0.58†
	Control	129.18±8.15	129.24±8.06	0.06+1.28	-0.39	0.69†
Independent two-group comparison test^		0.057	0.023	0.307		

†Paired t-test, ‡Wilcoxon test, ^Independent t-test, *U-Man-Whitney test

Discussion

The present study was conducted to determine the impact of implementing a self-care educational program based on Peplau's theory on self-care and treatment adherence of elderly patients with diabetes. The results of the current research indicated that the difference in average scores of self-care before and after the intervention in the intervention group patients at the end of the intervention was significantly higher than the difference in average scores of self-care of the control group patients. In other words, implementing a self-care educational program based on Peplau's theory had a significant impact on self-care in elderly patients with diabetes. In line with these results, Fernandes *et al.*(19) showed that implementing a self-care educational program based on Peplau's theory improved the level of self-care in patients with type 2 diabetes, and the use of this theory in the self-care of chronic patients, including type 2 diabetes, had a positive impact, which is consistent with our findings. In the present study, the intervention group significantly adhered more to dietary recommendations and foot care than the control group. Khiyali *et al.*,(20) and Hoshamandja *et al.*,(21) in Iran, Hiloo *et al.*(22) in Ethiopia, and Lee *et al.*,(23) in Korea also found similar results in their studies. Although differences in teaching methods and measurement tools used in these studies make it difficult to compare them, they collectively show a positive direction about the impact of educational interventions on adherence to diabetic nutrition and foot care. In terms of the sub-scale of regular drug usage, there was no significant difference in the average score before and after the intervention in the intervention group. The findings of the present research are consistent with the results of studies by Khayali *et al.*,(20) and Hooshmandja *et al.*(21)

The reason for the significant increase in patient drug adherence in the mentioned studies may be justified by reminding individuals through mobile phone follow-up in addition to emphasizing regular drug use to prevent serious diabetes complications. However, in the present study, education on regular drug use was only in one face-to-face session, which may be challenging for elderly individuals to remember. On the blood sugar control subscale, a significant difference was observed between the average score difference before and after the intervention in both groups, which is consistent with previous studies on diabetic patients.(20,21) In most developing countries, there is a significant gap between practical recommendations and provided care, which leads to poor blood sugar control.(24) Despite differences in educational methods and measurement tools used in these studies, overall, the results show that educational interventions can have a positive impact on controlling blood sugar in patients with type 2 diabetes. In the present study, no significant impact on physical activity was observed, which is not consistent with the results of study by Shojaeezadeh *et al.*,(25) but is in line with the study by Hailu *et al.*(22) In this research, given the advanced age of the study participants, simple and practical education including walking for about ten minutes after meals and avoiding sitting for more than an hour did not create the necessary motivation to improve physical activity later. On the smoking subscale, no significant difference was observed between the two groups. *Hailu et al.*(22) also did not report a significant difference in smoking in their studies. It seems that stronger motivations are needed for changing habits like smoking, and education alone may not create strong motivation in individuals.

The present research findings indicate that the average adherence to treatment after intervention in the intervention and control groups does not have a statistically significant difference. Therefore, it can be concluded that the educational intervention based on Peplau's theory could not have a significant effect on the overall adherence to treatment score of elderly diabetic patients. The educational intervention may provide to patients, due to being short or inadequate in meeting their real needs, may not have the ability to bring about significant changes in treatment adherence. Furthermore, environmental factors such as family support or cultural and social constraints can influence the effectiveness of the educational intervention Most of the search results highlight positive applications or outcomes of Peplau's theory in various nursing and healthcare contexts. A study on hospitalized older adults in cardiac intensive care units found that using Peplau's communication theory increased patient satisfaction with nursing care compared to a control group.(26) In addition, A study on elderly people with diabetes mellitus found that effective interpersonal relationships in nursing care correlated positively with greater treatment adherence to specific dietary recommendations.(27) Although this study did not explicitly use Peplau's theory, it highlights the importance of nurse-patient relationships in diabetes self-care.

The results showed that the self-care ability of the participants in this study was weak, which was consistent with the results of the study by Borhaninejad *et al.*(28). However, in the studies by Robbat Sarposhi *et al.*,(29) the level of self-care was assessed as average, which was inconsistent with the results of the present study. Discrepancies in the results of studies may be due to differences in measurement tools and population characteristics. Additionally, the timing and location of the studies may also play a role in these differences. The results of the present study indicated good adherence to treatment among the elderly participants. However, the study by Tanharo *et al.*(30) on diabetic patients showed poor treatment adherence, which was inconsistent with the present study. The difference in these results could be attributed to the limited sample size of the present study and the differences in the age groups of the study participants. In the present study, there was no correlation between age and treatment adherence, possibly because the study participants were elderly individuals over the age of 65. Tanharo *et al.*(30) showed that with increasing age, treatment adherence also increased, indicating a higher risk of diabetes complications with age.

Conclusion. Implementing a self-care educational program based on Peplau's theory has a positive impact on self-care in elderly diabetic patients. However, according to the results, the mentioned educational program did not have a positive impact on treatment adherence in these patients. Therefore, the nurse's role as healthcare providers for patients can be effective in reducing complications of chronic diseases, including diabetes.

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Dreaming of motherhood: experiences of women who have undergone fertility treatment

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Original Article

Dreaming of motherhood: experiences of women who have undergone fertility treatment

Abstract

Objective. to describe the strategies used by women who have undergone assisted reproductive technologies (ART) to cope with the process of becoming mothers and to describe their relationships with their partners and healthcare professionals throughout this process. **Methods.** This is a qualitative study based on grounded theory. Twenty women who had undergone ART in Spain were selected. Semi-structured interviews were used to collect the data. The analysis followed grounded theory methods. **Results.** 'Fighting for a dream: motherhood' is the main category describing women's struggles from their diagnosis of infertility to their successful pregnancy and delivery. This process makes it possible for them to fulfil their dream and become parents along with their partners. Three subcategories describe the different stages in the process: 'Accepting treatment: doing everything possible',

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Conflicts of interest: None.
Received date: 6 July 2024.
Approval date: 4 December 2024.

How to cite this article: Rujas-Bracamonte S, Serrano-Gallardo P, Martínez-Marcos M. Dreaming of motherhood: experiences of women who have undergone fertility treatment. Invest. Educ. Enferm. 2024; 43(1):e06.

DOI: https://doi.org/10.17533/udea.iee.v43n1e06

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

‘Undergoing treatment: an emotional rollercoaster’, and ‘Reconsidering the dream: give up or gather strength to keep going?’ **Conclusion.** Women undergoing ART experience difficulties as they seek to achieve pregnancy, as there is no guarantee that they will be able to fulfil their greatest desire in life: motherhood. Women use a variety of coping strategies during ART and continue to seek emotional support from their peers and/or women who are experiencing the same situation.

Descriptors: infertility; reproductive techniques, assisted; grounded theory; research, qualitative; women.

Soñar con la maternidad: experiencias de mujeres que se han sometido a un tratamiento de fertilidad

Resumen

Objetivo. Describir las estrategias utilizadas por las mujeres que se han sometido a un tratamiento de fertilidad para afrontar el proceso de ser madres, y describir sus relaciones con sus parejas y profesionales sanitarios a lo largo de este proceso. **Métodos.** Se trata de un estudio cualitativo basado en la teoría fundamentada. Se seleccionaron 20 mujeres que se habían sometido a Tecnología de Reproducción Asistida (TRA) en España. Se utilizaron entrevistas semiestructuradas para recoger los datos. El análisis siguió los métodos de la teoría fundamentada. **Resultados.** “Luchar por un sueño: la maternidad” es la categoría principal que describe la lucha de las mujeres desde su diagnóstico de infertilidad hasta su embarazo y parto exitosos. Este proceso les permite cumplir su sueño y convertirse en padres junto a sus parejas. Tres subcategorías describen las distintas etapas del proceso: “Aceptar el tratamiento: hacer todo lo posible”, “Someterse al tratamiento: una montaña rusa emocional” y “Reconsiderar el sueño: ¿renunciar o reunir fuerzas para seguir adelante?” **Conclusión.** Las mujeres que se someten a TRA experimentan dificultades al intentar conseguir un embarazo, ya que no hay garantías de que puedan cumplir su mayor deseo en la vida: la maternidad. Las mujeres utilizan diversas estrategias para mejorar el afrontamiento durante los TRA y continúan buscando apoyo emocional por parte de su entorno y/o de mujeres que están experimentando la misma situación.

Descriptores: infertilidad, técnicas reproductivas asistidas, teoría fundamentada, investigación cualitativa, mujeres.

Sonhando com a maternidade: experiências de mulheres que passaram por tratamento de fertilidade

Resumo

Objetivo. Descrever as estratégias utilizadas por mulheres que passaram por tratamento de fertilidade para lidar com o processo de se tornarem mães e descrever seus relacionamentos com seus parceiros e profissionais de saúde durante todo esse processo. **Métodos.** Este é um estudo qualitativo baseado na teoria fundamentada. Foram selecionadas 20 mulheres que passaram por Tecnologia de Reprodução Assistida (TRA) na Espanha. Entrevistas semiestruturadas foram utilizadas para coleta de dados. A análise seguiu métodos de teoria fundamentada. **Resultados.** "Lutando por um sonho: a maternidade" é a principal categoria que descreve a luta das mulheres desde o diagnóstico de infertilidade até a gravidez e o parto bem-sucedidos. Esse processo permite que eles realizem o sonho de se tornarem pais de seus parceiros. Três subcategorias descrevem os diferentes estágios do processo: "Aceitando o tratamento: fazendo tudo o que você pode", "Passando pelo tratamento: uma montanha-russa emocional" e "Repensando o sonho: desistindo ou reunindo forças para continuar?" **Conclusão.** Mulheres submetidas à TRA enfrentam dificuldades ao tentar engravidar, pois não há garantias de que conseguirão realizar seu maior desejo na vida: a maternidade. As mulheres usam várias estratégias para melhorar o enfrentamento durante a TRA e continuam buscando apoio emocional em seu ambiente e/ou em mulheres que estão passando pela mesma situação.

Descritores: infertilidade, técnicas de reprodução assistida, teoría fundamentada, pesquisa qualitativa, mulheres.

Introduction

Infertility is one of the main reproductive health problems in more economically developed countries, due in large part to the voluntary postponement of parenthood. The main causes of infertility in women are ovulation disorders, such as polycystic ovary syndrome, uterine disorders, and tubal disorders; in men, the most frequent causes of infertility are sperm disorders (morphology, concentration, mobility) and reproductive tract obstructions(1) In recent years, these problems have become more frequent and, consequently, the demand for assisted reproductive technologies (ART) to treat fertility disorders has increased.(2) Both infertility and ART have an impact on couples, but especially on women: before and during ART, women can display signs of deteriorating mental health and poor quality of life.(3,4) Moreover, ART can lead to heightened levels of stress and anxiety among women,(4) who tend to experience greater distress and fatigue than their male partners.(5) Psychological adjustment appears to be related to women's cognitive representations of infertility and ART, such that the more negative they are, the more negative their emotional responses will be; and in addition, intense social pressure to have children causes them greater levels of distress.(6) The need to have a child and the rejection of a childless lifestyle could become important predictors of anxiety and depression in the event that treatment is unsuccessful.(7)

Despite the harshness of the treatments, women often consider them a necessary sacrifice to have a child.(8) However, when ART fails to deliver, women frequently report symptoms of depression and anxiety.(9) Meanwhile, women who spend years receiving ART eventually accept the possibility that they will never have children, experiencing lower levels of stress and anxiety than women who have undergone a moderate number of treatments.(10) The experience of infertility and ART affects couples' family and social lives and is influenced by sociocultural factors: race, ethnicity, religion, social class, etc. In pro-natalist countries, infertility is a greater problem as women are particularly valuable when they achieve the "status of mother".(11) Social and family relationships may also be affected due to the couple's need to avoid painful situations such as children's events, as well as the perceived lack of empathy with their situation from those around them.(12)

Several studies have sought to identify the risks associated with ART, as well as investigating ways to boost success rates in terms of pregnancies and live births.(13) However, there has been little research into the experiences of women undergoing ART. Therefore, the aim of this study was to identify the strategies used by women who have undergone ART to cope with the difficulties they experienced and describe their relationships with their partners and the healthcare professionals who provided them with care throughout the process.

Methods

This qualitative study takes a constructivist grounded theory approach.(14) It is situated within the constructivist paradigm, which holds that reality is local and specifically constructed through action and considers people to be actors in the social world. Like classical grounded theory, this study adopts the theoretical perspective of symbolic interactionism. The study participants were 20 women aged 18-45 years old, who had received ART at public hospitals or specialist private clinics in Spain and had had a child in the last two years. No exclusion criteria were applied. In the first stage, purposive sampling was used and, as the study progressed, participants were selected based on their causes of infertility, maternal age, and years spent trying to conceive to complete the emerging categories. In the second stage, theoretical sampling was carried out to refine and develop the emerging categories. The recruitment of the participants was carried out by the first author face to face. The data were collected between September 2019 and February 2021 using semi-structured interviews that included the following items: Tell me about your experience with assisted reproduction treatment. Had you received other treatment previously or was it the first time? What type of treatment was it? Where did you carry it out? How did you feel?; Have you ever felt overwhelmed? What was it due to?; Have you felt the need to seek support from women who have gone through the same thing as you? In what way?; What was the relationship like with the healthcare personnel throughout the entire process?; How was your relationship with your partner been during the process? And with your family and friends? These questions offered the flexibility needed for participants to freely discuss their experiences. A pilot was carried out with four women. The interviews were conducted by the first author (credentials: woman, PhD, midwifery with training in the field), who had no previous relationship with the participants. Due to the epidemiological situation resulting from the COVID-19 pandemic, 12 interviews were held via video call, while the remaining interviews were conducted at participants' homes or cafés, depending on their preferences. No one else was present during the interview. The interviews lasted between 60 and 90 minutes. All interviews were recorded. Data collection ended when theoretical saturation was reached. No one refused to participate. No interview was repeated.

Field notes were made during and after the interviews. The interviews were transcribed in their entirety by the same researcher who conducted them to ensure the greatest possible precision. Data analysis was carried out concurrently alongside data collection using the constant comparative method. Firstly, open coding was performed using microanalysis, giving rise to *in vivo* codes such as 'Doing everything possible', 'Ups and downs', 'Feeling supported', and 'Feeling incapable'. Subsequently, focused coding was conducted to give rise to categories and allow them to be combined and refined. Analytical and theoretical memos were written throughout the analysis to help guide the process and diagrams were produced to make it easier to identify relationships between categories, always seeking consistency with the data.. A single coder (the first author) carried out the coding of the data. The categories were not identified beforehand but were derived from the data. No software was used to manage data.

Various strategies were used to ensure the rigour of the study. Credibility was established by allowing the participants to freely express their experiences and by using their words to generate codes. Reliability was achieved through a detailed description of the selection process, taking the sociodemographic characteristics of the participants into consideration, and reporting the steps taken during the research process. A preliminary analysis of the first interviews was presented to the participants at a meeting; the information provided by them was used to review and confirm the emerging categories, enhancing the study's relevance and credibility. Quotes from participants (identified by numbers) were presented to illustrate the categories. The first author maintained a reflexive stance, using a reflexive diary and field notes on theoretical and analytical aspects, which made the study more rigorous.

The research project was approved by the Ethics Committee of the Universidad Autónoma de Madrid (CEI-88-1644) and of the Hospital de Móstoles (CEIC 2018/014). All participants were informed, agreed to participate voluntarily, and signed the corresponding informed consent form. The confidentiality of the data and the anonymity of the participants were always guaranteed. Numeric codes were assigned to the verbatims extracted from each of the interviews. Only the first author Only the author had access to the personal data of the participants.

Results

At the time of interview, most of the participants were aged 30-39 (70%) and took 2-4 years to conceive (50%). The most frequent cause of infertility was female (35%), The most frequent marital status was married (75%) and carried out the treatment in private hospitals (60%). Most of the participants completed university studies (40%) **(Table 1).**

Table 1. Characteristics of study of the 20 participants

Variable	Categories	*n*	%
Age	< 30	2	10
	30-34	7	35
	35-39	7	35
	40 and more	4	20
Age of start seeking pregnant	< 30	9	45
	30-34	9	45
	35-39	1	5
	40 and more	1	5
Highest level education completed	Primary school	2	10
	High school	4	20
	Vocational training	6	30
	University Education	8	40
Marital status	Married	15	75
	Cohabiting	3	15
	Single	1	5
	Divorced	1	5
Causes of infertility	Male infertility	6	30
	Female infertility	7	35
	Mixed infertility causes	5	25
	Unexplained infertility	2	10
Time to get pregnant	< 2 years	4	20
	2-4 years	10	50
	> 4 years	6	30
Place of treatment	Public Hospital	8	40
	Private Hospital	12	60

The process experienced by the women from their infertility diagnosis to their successful pregnancy, which constitutes **'Dreaming of motherhood'** and enabled them and their partners to become parents, is described (Figure 1). Three subcategories point to the different stages in the process: 'Accepting treatment: doing everything possible', 'Undergoing treatment: an emotional rollercoaster', and 'Reconsidering the dream: give up or gather strength to keep going?'.

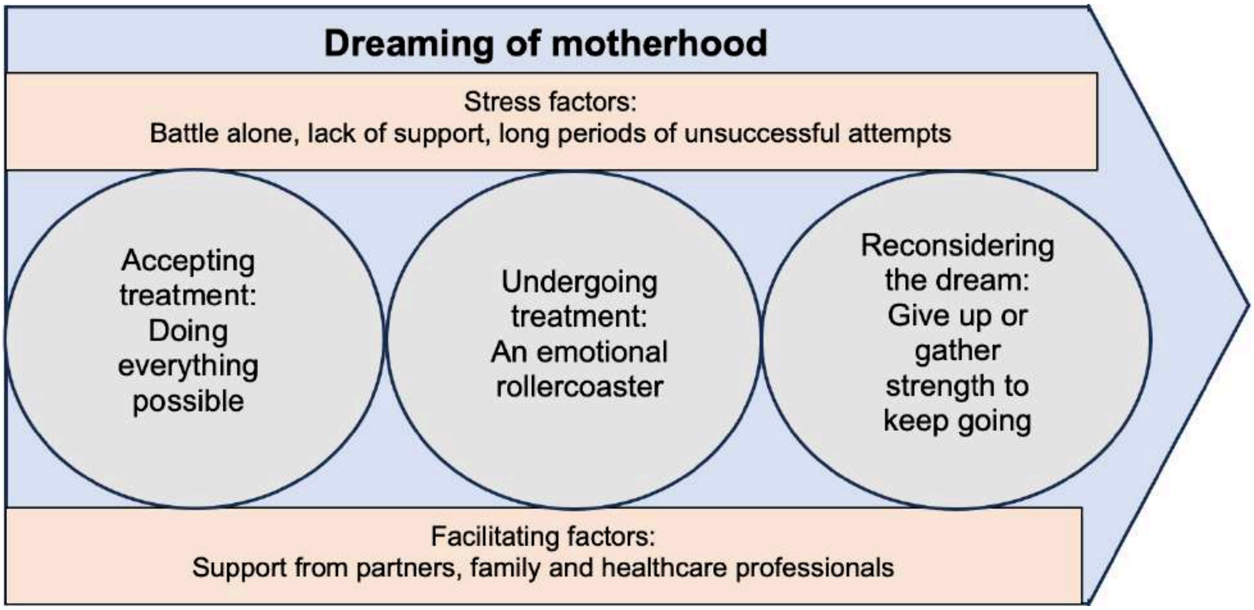

Figure 1. The process experienced by the women from their infertility diagnosis to their successful pregnancy

Accepting treatment: doing everything possible

Once the women and their partners had acknowledged and accepted their infertility diagnosis, they decided to visit assisted reproduction clinics and accept the treatments offered to them. They made this decision after failing to conceive for long periods of time and experiencing an intense desire for parenthood, which they idealised over time, prompting the women to pursue the treatment(s) that would make it possible for them to fulfil their dream. They hoped and trusted that this treatment would be effective. The women accepted the treatment recommended to them by healthcare professionals, trusting that they would be offered the best option to achieve a long-awaited positive pregnancy test: *I was certain that I would be a mother, one way or another I would be a mother, for sure. I couldn't imagine life with just the two of us... no, no way. It didn't even cross my mind* (Informant 1; 33 years, 2 years to conceive, married).

When a woman's partner shared her desire to have children, this was a strong source of added motivation to embark on the proposed treatment and tackle the problem of infertility. The joint nature of this decision made the therapeutic process more tolerable: *He said to me: 'You and I are going to be parents, no matter what, we're going to be parents'. And he said: 'I want you to get pregnant, I don't want to adopt or... I want you to get pregnant and feel what it's like to be pregnant'.* (Informant 6; 32 years, 7 months to conceive, married). When the couples had sufficient financial resources, they decided to commence treatment as quickly as possible. The intense desire expressed and demonstrated by the women drove them to seek to avoid the long waiting lists for treatment at public hospitals. In these situations, couples began ART at specialist private clinics with high pregnancy success rates in order to reduce the waiting time and fulfil their dream as soon as possible: *So we started the process, we didn't think twice because I was so eager…* (Informant 17; 33 years, 3 years to conceive, married).

The study participants felt that they were the ones to suffer the physical and mental burden of treatment and that the burden was not shared with their partners, as most of the treatments involved medication for the women, who then suffered the resulting side effects. Treating infertility requires regular monitoring and visits to the clinics, which fall to the women to attend, sometimes alone: *It's a huge burden… you do feel that the burden is on you, because you're the one that has to get pregnant, you're the one that has to take medication…* (Informant 2; 34 years; 2'5 years to conceive, cohabiting). Despite the women's efforts and the extra burden that they carried, the desire to have children motivated them to continue their treatment, no matter how difficult and tiresome it could be. During treatment, the women were not concerned about the pain involved in certain techniques, such as egg retrieval, nor about the possible side effects of the medication prescribed; they were capable of prioritising their desire to conceive over their physical wellbeing: *I wanted to have a child and I didn't care what I had to go through* (Informant 1).

In order to conceive, the study participants not only adhered to the medication regimes that they were prescribed but also followed recommendations for a healthier lifestyle (balanced diet, moderate exercise, weight loss in the case of overweight or obesity, eliminating or reducing toxic habits such as smoking and alcohol, etc.) and endeavoured to rigorously comply with all the recommendations made by their healthcare professionals. The women also consulted other sources of information online and on social media, such as: different types of ART, steps to take, types of diagnostic tests that would provide more information, how to improve the results of ART, etc. When they searched for information online, this was largely because their healthcare professionals were not very approachable, their visits were short and mechanical, and they and their partners were given insufficient time to ask any questions they had. Knowledge and information about the treatments gave the women a sense of greater control over their situation and their destiny:*At the same time, I was researching elsewhere, and I have to say that if I hadn't done that research and played an active role, I might not have got pregnant. I wouldn't even have got pregnant. There's a lot of ignorance around all this* (Informant 3; 28 years, 3 years to conceive, married).

The women were more active than their partners when it came to finding information about treatment and general care to achieve a successful pregnancy. When their partners did not cooperate with the recommendations for care and healthy habits or continued to engage in unhealthy habits such as smoking or failing to lose weight, the women were frustrated because they perceived these behaviours as an additional obstacle to pregnancy and to fulfilling their dream: *For example, in our case my partner smoked. We knew that smoking wouldn't improve his sperm quality. You get angry every time they smoke a cigarette* (Informant 4; 37 years, 5 years to conceive, cohabiting).

Undergoing treatment: an emotional rollercoaster

Women undergoing treatment for infertility face an unfamiliar process, both in terms of the procedures carried out and the eventual outcome, which is not guaranteed to be successful. The process is described by the study participants as an emotional rollercoaster, characterised by mixed emotions and emotional ups and downs, with lows and highs experienced within the same day, and oscillation between hope and disappointment, uncertainty and fear, joy and sadness at different stages of treatment: *It's not linear, like 'Oh, I can't do it', you have emotional ups and downs, up, down, up, down (...). And they tell you it's really... important for you to be optimistic and have a positive outlook. But of course, you're positive, positive... and then it goes downhill. It's really tough, I had a really hard time* (Informant 8; 35 years, 5 years to conceive, married).

At the start of their treatment, the women experienced hope and optimism, which was accentuated if they had received an infertility diagnosis with a positive prognosis or if they felt they were in the care of prestigious healthcare professionals with high pregnancy success rates. The availability of statistics on the probability of a successful pregnancy following ART had less of an influence than their hope in the prestigious professionals delivering their treatment. This may be why the couples experienced considerable disappointment after receiving a negative result at the start of their treatment: *We were so hopeful, we were very naive, complete novices and we thought: 'We're at the best clinic, we're undergoing the best treatment at* * [private clinic], *we're with the medical director of... I'm going to get pregnant; especially with PGD* [preimplantation genetic diagnosis] *and they're telling me that my eggs are good quality and all that, I'm sure to get pregnant.' We were so hopeful... and that was our mistake* (Informant 5; 39 years, 4 years to conceive, married). However, the women who had more information and were familiar with other women's experiences of fertility treatment (friends or family members) were more aware of the success rates of different treatments. This knowledge of the experiences of women close to them made them hopeful but more realistic as they underwent the first treatment, as they were aware that the first procedure tends to fail. This cognitive coping strategy based on realistic thoughts and arguments made them more prepared for a negative result and normalising the situation helped them and their partners to cope with their disappointment and failure: *I mean, you start off well, the first one's fine, you're really hopeful. But when you do the test and it's negative, you expect it because you understand that based on the percentages, they give you... it's normal that you don't get pregnant the first time* (Informant 2).

During treatment, the women experienced intense emotions related to various factors. On the one hand, the lengthy waiting times between medical consultations raised the women's stress levels as they felt that they were wasting time. On the other, good news (being perfectly placed to start treatment) often went hand-in-hand with bad news (failure of treatment despite optimal conditions). These mixed emotions were destabilising for the women, who experienced feelings of optimism and joy at the good news they received and disappointment and sadness when the treatment failed, all within the same treatment cycle: *Then comes the downer: 'You're perfect, your uterine lining is perfect, you're a textbook case. I've got an incredible grade A blastocyst'. And then I don't get pregnant again... so, it's a situation I wouldn't wish on anyone* (Informant 8). During the waiting time between embryo implantation or insemination and pregnancy testing, the women experienced uncertainty as they were unable to immediately ascertain the outcome of the treatment. Generally speaking, this uncertainty led to anxiety and desperation; the women experienced fear and concern that their actions might jeopardise the success of the treatment and sadness at the thought that they might receive a negative result: *During those 12 days, I think it was, before they did the test, I did a load of tests myself…* (Informant 1).

The participants who successfully conceived after the first or second attempt considered themselves to be lucky, as one woman said, as they had not had to undergo lengthy treatment processes like other women, which constituted sufficient reason to complain about the process: *We were very lucky that on the first attempt… there you have it.* (Informant 11; 34 years, 3 years to conceive, married). However, the couples who had undergone several successive treatments and obtained negative results each time felt frustration, sadness, and sometimes guilt. Their frustration was triggered by being unable to understand why the treatments they had undergone had failed. The women sometimes experienced guilt if unforeseen events during the treatment cycle had caused them added stress or if they thought they had engaged in an activity that could have had a harmful effect. In response to their failure to conceive, they sought personal causes and this heightened their feelings of guilt and frustration. The negative results of the treatments distanced the women still further from their goal of motherhood: *And then, [there's] even a sense of guilt. Because you often start to think: 'Why hasn't it stuck? Is it because I had chips?'* (Informant 4).

The failure to achieve motherhood reinforced a more negative experience and the idea that the women's bodies were unfit as they were unable to achieve or maintain pregnancy. The need to find an explanation prompted them to consider the possibility that there was a problem that had not yet been diagnosed or identified, causing them to distrust the treatments and healthcare professionals. Attributing failure to the treatments or professionals delivering them was a strategy that allowed the women to remain hopeful that they would be able to conceive: *The last three or four months were like: 'No, we're not going to achieve it, it's not working, something's wrong'. My thoughts were: 'Something's wrong, something's up that you can't see and that… that's making it not work'* (Informant 2).

During treatment, if the couple were treated in a cold, dehumanising manner by healthcare professionals or if care was solely focused on the woman, they had a more negative experience; they felt misunderstood and frustrated, as well as considering that their emotional needs throughout the process had been overlooked. On the contrary, when they were given an opportunity to experience the entire treatment process with their partners, the women had a more positive experience as it made the process feel more natural and more like a spontaneous pregnancy: *In my case, they didn't even look at my husband at the visits. He'd be asking questions and they'd look at him and reply like: 'You have no right to ask questions'. It was all centred around the mother, which is great but he's just as important as me, the process is about both of us and he's 50% of it* (Informant 11).

Support from partners was a key factor influencing the women's experiences. The couples who approached treatment as a shared problem and struggle described how the situation had strengthened the bond between them. However, when the members of the couple held different attitudes to treatment and the woman felt like she was fighting a battle alone, the couples were plunged into crisis. A lack of understanding and communication within the couple made it harder to express their feelings and give and receive support. *Sometimes he'd say: 'you're obsessed with it'. I'd say to him: 'No, if you had it your way, we might still be at the first clinic'* (Informant 3).

The couples' families and friends had an impact on their experiences of ART. Support from family and friends helped make the process less stressful. However, despite having a strong support network, not all the couples wanted to share the news that they were undergoing treatment and avoided discussing it with the people close to them to reduce stress. In some cases, they even pretended that they were fine despite their treatment failing to save family members and even their partners from worrying about them. Looking for support from women who had gone through the same experience and reading their stories helped them cope with their failed treatment: *It depends on each person's experience, the people around you, the support you have... financial support, emotional support, how you want to tell people about it. Because you spend the whole day talking about it, it's your whole life, and that's difficult. If you don't talk about it it's like you're withdrawing into yourself, if you talk about it it's like... people don't know how to talk about it, they don't know what to say* (Informant 18, 42 years, 2 years to conceive, divorced).

Reconsidering the dream: give up or gather strength to keep going?

Women who experienced multiple failures to conceive weighed up different options and employed a variety of strategies. Some considered abandoning treatment as they were overwhelmed and found themselves unable to repeat the same cycles and relive the same experiences. The physical and mental burden on women during ART is intense. Some participants reached the conclusion that it was not worth the suffering and questioned whether to continue with the treatment or give up as they felt unable to cope – both physically and psychologically – with another treatment and another possible failure. The study participants considered different options: giving up and abandoning treatment or having a break before continuing their struggle. The idea of giving up was stronger in older women and women who had undergone more treatments.

The women opted to have a break to recover before continuing to fight to conceive; they thought that this would allow them to control their emotions, gather strength, and prevent the quest for pregnancy from taking over their entire lives: *I'd set a deadline, a time limit. I was very clear on that: if that last time didn't work, I wouldn't be a mother and that would be fine, that would be it* (Informant 18). Breaks between one treatment and another is a strategy that the women believed would enhance the efficacy of the treatment. In their thoughts and reflections, they wondered whether their bodies were not responding adequately to the treatment due to their physical and mental exhaustion, making a break from treatment necessary: *My body was completely exhausted by that point. I'd had almost 90 injections; the third stimulation took a long time because the follicles were growing much slower. I was exhausted from travelling so much, from so many injections. I was a bit... I was carrying a lot of baggage, and my body wasn't responding as it should* (Informant 6).

Discussion

The results of this study reveal the difficult process experienced by women undergoing ART as they attempt to achieve a successful pregnancy, as they must live with the uncertainty and fear that they will be unable to fulfil their greatest wish: motherhood. In this situation, ART becomes a priority that takes precedence over other areas of their lives. Women who are eager to conceive after long periods of unsuccessful attempts opt for treatment at private clinics to start as soon as possible. This is likely to be associated with the limited resources for ART in the public health system.(15) This study shows that women seek information online to acquire the skills they need to handle ART, understand the steps involved, and learn how to boost their chances of a positive result, reinforcing the idea that women continue to feel responsible for reproduction and tackling infertility. This finding is corroborated by other studies. Weissman *et al*.(16) showed that women look for more information online than men, regardless of the cause of infertility. Mayette *et al*.(17) also point out that although women preferred to use the information provided by the health professionals who cared for them, this was felt to be insufficient and they would turn to other sources to better understand the whole process they were going through, especially with regard to mental health support during treatment. ART places a considerable physical and mental burden on women. This is apparent both in women who are accepting that they need treatment and those who are undergoing treatment. In some cases, they need to take breaks as a strategy to increase the efficacy of treatment or they consider abandoning treatment altogether if they do not become pregnant on the next attempt. The results of this study indicate that one of the key factors prompting women to abandon treatment may be a loss of hope of ever having a successful pregnancy. Stress experienced by women undergoing treatment and financial difficulties are reasons for treatment drop-out reported in the literature.(18,19) Research has also shown that some women, despite experiencing an intense desire to abandon or pause their treatment, feel forced to continue due to the pressure placed upon them by healthcare professionals at clinics.(20)

This study shows that women who do not consider abandoning treatment feel a duty to do everything possible to have a child, as they do not want to give up on this plan for their lives. The existence of more effective treatments, such as egg donation or gamete donation, encourage women to continue the process by keeping the hope that they will eventually have children alive as they have not yet exhausted all treatment options. Copp *et al*.(21) demonstrate that the decision on whether to continue treatment is related, among other factors, to perceived social pressure and fear of future regret at not having fought to have children. Doing everything possible to access motherhood reflects women's need to adhere to established social norms and fit into the social construct of "woman=mother".(22) In the work of Fusco et al, participants described their bodies as the repository of their hopes, but also as impaired, defective and non-functional, thus forming a 'paradoxical' representation. This links to the socially derived meanings of infertility since the expectations women expressed were that their bodies were born to procreate.(23) Couples undergoing ART should be given information about the process in accessible language and sufficient time at their medical consultations to answer all their questions, as this study has highlighted. They also appreciate being given "bad news" in an appropriate manner and receiving emotional support from healthcare professionals who are pleasant and show empathy. These results corroborate those obtained by other researchers.(24,25)

This study also found that a lack of personalised care led to greater emotional distress among couples and resulted in distrust of the healthcare professionals caring for them. Meanwhile, some men felt overlooked and even ignored at medical consultations when care was exclusively centred on women. As in other studies, these results show that sharing hopes, disappointments and pain with partners can help to strengthen couple bonds and influence women's experiences, making it easier for them to cope.(26) In addition, couples feel it is very important to work together to build the parent-child relationship and achieve the goal of having a child.(25)

Regarding the limitations of the study, given the importance of personal interaction and contact for data collection in qualitative research, the data may have been influenced by the virtual format of the interviews during the COVID-19 pandemic. Above all, however, the health and wellbeing of the participants and researchers was prioritised, and the personal situation of the participants was checked before each interview to confirm that they were still willing to participate.(27) Meanwhile, it is possible that the results may differ in other sociocultural contexts where ART is more accessible in the public health system or where there is less social pressure to have children.

Future research should explore the experiences of women with secondary infertility, as their experiences may be different having previously had children naturally. It is also relevant to explore couples' experiences of ART, including same-sex couples, as well as those of women who decide to undergo treatment without a partner.

Conclusion. Motherhood is a dream that the women in this study wished to fulfil. As a result, they decided to undergo ART to achieve this goal after accepting their infertility diagnosis. Women use various strategies to improve coping during ART: they seek information to help them understand and manage the problem and improve treatment outcomes, and they continue to seek emotional support from their peers and/or women who are experiencing the same situation. Similarly, feeling that it is a shared battle with their partner and having empathetic health professionals also facilitates coping during the process. They also use different tactics to adapt to motherhood, such as dedicating time to self-care or going to health professionals for support and emotional support. Co-responsibility for the care of the child also helps women to adapt, as they do not feel alone in caring for the new member of the family. In addition, the ordeal of treatment can help women to develop resilience, helping them to cope better with all the hard times of motherhood. Health professionals must attend to the emotional needs of women in a systematic and protocolised way, so that their quality of life is not affected. Midwives and obstetricians, because of their closeness to women during pregnancy, childbirth and postpartum, have a key role in attending to women's needs. They should value maternal wellbeing, promote the expression of feelings and facilitate strategies that allow them to face this process in the best possible way, as well as discourage actions that may encourage stress and anxiety in women.

Acknowledgement: We would like to thank all participants in the study for providing their valuable perspectives.

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Original Article

The effect of a gratitude program based on positive thinking on nurses' resilience in the post-Coronavirus 2019 pandemic era

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The effect of a gratitude program based on positive thinking on nurses' resilience in the post-Coronavirus 2019 pandemic era

Abstract

Objective. To evaluate the effect of a gratitude program based on positive thinking on nurses' resilience in the post-Coronavirus pandemic era. **Methods.** This is a quasi-experimental study. Eighty nurses in Peimanieh Hospital affiliated to Jahrom University of Medical Sciences were selected using convenience sampling method. They were randomly assigned to the intervention group (*n*=40) and control groups (*n*=40) from September to December 2023 in the southern of Iran. The intervention group were given a gratitude plan based on positive thinking in 28 days using WhatsApp in the form of daily. Training content were according to the positive psychotherapy and gratitude of Seligman and Rhonda Byrne. The subjects of control group were not taught. Data were gathered

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Conflicts of interest: None
Received: October 9, 2024.
Approved: January 22, 2025.

How to cite this article: Dehghani A. The effect of a gratitude program based on positive thinking on nurses' resilience in the post-Coronavirus 2019 pandemic era. Investigación y Educación em Enfermería. 2025; 43(1):e07.

DOI: https://doi.org/10.17533/udea.iee.v43n1e07

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

using Connor-Davidson Resilience Scale. Results. The findings determined that immediately and two months after the intervention the total mean resilience scores had significant differences between the two groups ($p<0.001$). Repeated measures testing revealed significant improvements in total mean resilience scores from baseline to two months post-intervention ($p=0.002$), while between time points in the control group was not significant difference ($p=0.32$). Conclusion. The findings provide evidence for the use of a gratitude programme, based on positive thinking, to increase resilience in nurses in the post-Coronavirus 2019 era.

Descriptors: positive thinking; gratitude; resilience; nurse; Post-COVID condition.

Efecto de un programa de gratitud basado en el pensamiento positivo sobre la resiliencia de las enfermeras en la era posterior a la pandemia del coronavirus 2019

Resumen

Objetivo. Evaluar el efecto de un programa de gratitud basado en el pensamiento positivo sobre la resiliencia de las enfermeras en la era posterior a la pandemia del coronavirus. **Métodos.** Se trata de un estudio cuasi-experimental en el que se seleccionaron por muestreo por conveniencia a 80 enfermeras del Hospital Peimanieh, afiliado a la Universidad de Ciencias Médicas Jahrom (Irán), las cuales fueron asignadas aleatoriamente a los grupos de intervención ($n=40$) y de control ($n=40$). La recolección de la información se realizó entre septiembre y diciembre de 2023. El grupo de intervención recibió un programa educativo de gratitud fundamentado en el pensamiento positivo durante 28 días utilizando WhatsApp. El contenido de la intervención se basó en la psicoterapia positiva de Seligman y en el poder de la gratitud y Rhonda Byrne. Los sujetos del grupo de control no recibieron formación. Los datos se recogieron utilizando la Escala de Resiliencia de Connor-Davidson. **Resultados.** Los hallazgos mostraron que, inmediatamente y dos meses después de terminada la intervención, las puntuaciones medias totales de resiliencia presentaban diferencias significativas entre los dos grupos ($p<0.001$). Las pruebas de medidas repetidas revelaron mejoras significativas en las puntuaciones medias totales de resiliencia desde el inicio hasta dos meses después de finalizada la intervención ($p=0.002$), mientras que entre los puntos temporales en el grupo de control no hubo diferencias significativas (p=0.32). **Conclusión.** Los resultados proporcionan evidencia para el uso de un programa de gratitud basado en el pensamiento positivo, para aumentar la resiliencia en las enfermeras en la era post-Coronavirus 2019.

Descriptores: optimismo; gratitud; resiliencia; enfermeras; condición post-COVID

Efeito de um programa de gratidão baseado no pensamento positivo na resiliência dos enfermeiros na era pós-pandemia do coronavírus de 2019

Resumo

Objetivo. Avaliar o efeito de um programa de gratidão baseado no pensamento positivo na resiliência dos enfermeiros na era pós-pandemia do coronavírus. **Métodos.** Este é um estudo quase experimental no qual 80 enfermeiros do Hospital Peimanieh, afiliado à Universidade de Ciências Médicas Jahrom (Irã), foram selecionados por amostragem de conveniência e designados aleatoriamente para grupos de intervenção (n=40) e controle (n=40). A coleta de dados foi realizada entre setembro e dezembro de 2023. O grupo de intervenção recebeu um programa de educação sobre gratidão baseado em pensamento positivo por 28 dias usando o WhatsApp. O conteúdo da intervenção foi baseado na psicoterapia positiva de Seligman e no poder da gratidão e em Rhonda Byrne. Os indivíduos do grupo de controle não receberam treinamento. Os dados foram coletados usando a Escala de Resiliência de Connor-Davidson. **Resultados.** Os resultados mostraram que imediatamente e dois meses após o término da intervenção, as pontuações médias de resiliência total apresentaram diferenças significativas entre os dois grupos (p<0.001). Testes de medidas repetidas revelaram melhorias significativas nas pontuações médias de resiliência total desde o início até dois meses após o término da intervenção (p=0.002), enquanto entre os pontos de tempo no grupo de controle não houve diferenças significativas (p=0.32). **Conclusão.** Os resultados fornecem evidências para o uso de um programa de gratidão baseado no pensamento positivo, para aumentar a resiliência em enfermeiros na era pós-Coronavírus 2019.

Descritores: otimismo; gratidão; resiliência; enfermeiros; condição pós-COVID

Introduction

In 2020, the World Health Organization classified the coronavirus infection as a pandemic. This virus has caused many pressure on healthcare systems everywhere the universe. Injuries to healthcare workers are on the rise due to rising infections, and lack of access to necessary personal protective equipment and medical beds. Nursing staff are in the early stages of the health crisis and are facing many challenges caused by COVID-19.(1) Lorente et al. found that in addition to COVID-19, the possibility of infection, heavy workload, and inadequate preparation were related with mental health impairments among caregivers, but these impairments could be reversed. The author said it was controlled by resilience.(2) Another study found that upper resilience and positivity were related with less burnout, negative emotions, and emotional exhaustion.(3)

One of the variables that plays an important role in the nurse's profession is resilience.The resilience as an approach that allows individual to compatibility to undesirable and keep hope.(4) Resilience criteria assess an individual's ability to seek out and utilize support networks, increase self-awareness and accept situations, and grow after stressful situations.(5) Positive thinking is a new event in the psychological society that relies on need to understand the positive aspects of human experience and what makes life worth living.(6) Previous research has shown the influence of positive thinking on mental health indexes in people with chronic illnesses.(7,8) One aspect of positive thinking is gratitude, which makes people happier, more hopeful, and more satisfied with life.(9) Gratitude interventions lead to significant improvements in psychological, spiritual, and physical health. Because grateful people are stronger than others at forming social engagements, using stress management skills, being inclusive, and working creatively to solve problems.(10)

The use of social media as a training approach has been introduced to make conveying concepts and materials easier, more comprehensive, and more engaging through text, audio, images, and video, and this method is now widely used for concept conveyance.(11) The unique features of PC- and phone-based multimedia training programs allow you to overcome the limitations of traditional training, including how to understand the current situation of the new coronavirus infection outbreak. Therefore, this study aims to examine the effects of a gratitude program based on positive thinking using multimedia on nurses' resilience, taking into consideration the mental health of the nursing profession and nurses in the post-coronavirus pandemic era.

Methods

This study is a quasi-experimental study conducted at the Peimanieh Hospital affiliated to Jahrom University of Medical Sciences from September to December 2023, Iran. Participation criteria, absence of psychological problems, and intention to participate in the study of nursing staff in the new coronavirus infection ward. Exclusion criteria were not completing the questionnaire or attending the training course. In this study, 80 nurses were selected using convenience sampling method from among nurses who had the study inclusion criteria and after randomly divided into control and intervention groups. Due to the limited number of nurses who had the study inclusion criteria and were willing to participate in the study, random sampling was not possible and randomization was done only in the distribution of samples into intervention and control groups. The intervention type was assigned to nurses randomly using permuted block randomization with a block size of 10 (using the table on random permutation). Blinding was not performed.

Data were collected through demographic information and the scale Connor-Davidson Resilience Scale (CD-RISC). The CD-RISC included 25 questions distributed in 5 dimensions, each item is rated using a five-point (1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree). The score for each dimension was determined by summing the scores for that question. The overall resilience score is the sum of the scores for all questions range from zero to 100, with higher values indicating more resilience.(12) The validity of scale was confirmed by Mohammadi, with Cronbach's alpha being 0.89(13) In the current research, this coefficient obtained was 0.77.

In the intervention group, training and practice on gratitude program based on positive thinking through multimedia application (WhatsApp) was conducted in 28 days in the form of daily. Training content were according to the positive psychotherapy and gratitude of Seligman and Rhonda Byrne.(14,15) Contents discussed in every session with more details in the appendix data. Instructional methods include video clips and audio files that correspond to the training topics.

Ethical considerations. This study was confirmed by the ethics committee of Jahrom University of Medical Sciences (Ethics Number IR.JUMS.REC.1400.051). All the participants signed an informed consent. The aims and approach of the research were explained to them and they were then given adequate trust regarding the confidentiality of the data. In addition to, after the completion of the study and for meet the study ethics, the educational contents for the control group were accomplished.

Data analysis. Information was analyzed using SPSS V.21. Shapiro-Wilk tests of data distribution, chi-square tests, independent t tests, repeated measures, and LSD post hoc tests were used. The significance level was assumed to be $p<0.05$.

Results

There were five persons withdrew in the control group. One person did not participate in the educational sessions in the intervention group; in the end, 39 nurses participate in the intervention group and 35 persons participate in the control group.

Hence, six of the participants were withdrawn from the study during the study due to lack of follow-up. Based on the findings, the demographic characteristics were the same in both groups ($p>0.05$) (Table 1).

Table 1. Frequency distribution of demographic variables in the study groups

Variable	Group		p-value
	Intervention (*n*=39)	Control (*n*=35)	
Gender; *n* (%)			
Male	5 (12.8)	5 (14.3)	0.52*
Female	34 (87.2)	30 (85.7)	
Marital status; *n* (%)			
Single	10 (25.6)	7 (20)	0.29*
Married	29 (74.4)	28 (80)	
Educational status; *n* (%)			
Bachelor of Nursing	35 (89.8)	31 (88.6)	0.70*
Master of Nursing	4 (10.3)	4 (11.4)	
Age; (Mean±SD)	37.05 ± 5.67	35.23 ± 8.38	0.27**
Work experience; (Mean±SD)	3.33 ± 1.10	3.34 ± 1.71	0.97**

* Chi-square, ** Independent samples test

The between the two groups regarding the resilience score and its dimensions no significant differences were observed in the before the intervention ($p>0.05$). Immediately after the intervention, a significant difference in resilience scores was observed between the two groups ($p<0.05$) for the total and for three of the five dimensions (positive acceptance of change and secure relationships, control and spiritual influences). Furthermore, between the two groups in the 2 months after the intervention was observed significant differences in the total and dimensions scores of the CD-RISC, although the mean value was upper in the intervention group ($p<0.001$). Repeated measurements showed that mean resilience improved significantly over time in the intervention group ($p<0.001$) (Table 2) (Diagram 1).

Table 2. Comparison of the mean total scores of resilience and its subscales before, immediately, and two months after the intervention in the two groups

Variable	Group	Time			*p*-value
		Before intervention	Immediately after intervention	Two months after intervention	
Total resilience	Intervention	66.48 ± 17.78	69.66 ± 4.74	74.71 ± 7.44	0.002
	Control	66.25 ± 9.03	67.94 ± 10.50	66.02 ± 8.41	0.32
	p-value	0.94	0.03	0.0001	
Personal competence	Intervention	18.94 ± 5.78	19.97 ± 2.37	21.74 ± 2.80	0.0001
	Control	19.42 ± 3.96	19.96 ± 2.40	19.82 ± 2.58	0.16
	p-value	0.12	0.18	0.001	

Table 2. Comparison of the mean total scores of resilience and its subscales before, immediately, and two months after the intervention in the two groups (Cont.)

Variable	Group	Time			*p*-value
		Before intervention	Immediately after intervention	Two months after intervention	
Trust in one's instincts and tolerance of negative Affect	Intervention	17.66 ± 0.70	18.02 ± 0.54	23.67 ± 0.21	0.001
	Control	17.91 ± 0.74	18.82 ± 0.57	18.88 ± 0.52	0.63
	p-value	0.32	0.13	0.0001	
Positive acceptance of change and secure relationships	Intervention	13.33 ± 3.99	15.48 ± 2.19	16.41 ± 2.14	0.016
	Control	13.17 ± 3.11	13.62 ± 3.91	12.71 ± 3.65	0.12
	p-value	0.84	0.013	0.0001	
Control	Intervention	8.58 ± 2.90	10.02 ± 1.87	13.65 ± 1.22	0.02
	Control	7.45 ± 2.89	7.00 ± 2.87	8.05 ± 2.33	0.18
	p-value	0.09	0.012	0.013	
Spiritual influences	Intervention	5.07 ± 2.45	6.98 ± 1.61	8.24 ± 1.14	0.01
	Control	5.57 ± 1.98	5.59 ± 2.01	5.32 ± 1.95	0.30
	p-value	0.34	0.04	0.0001	

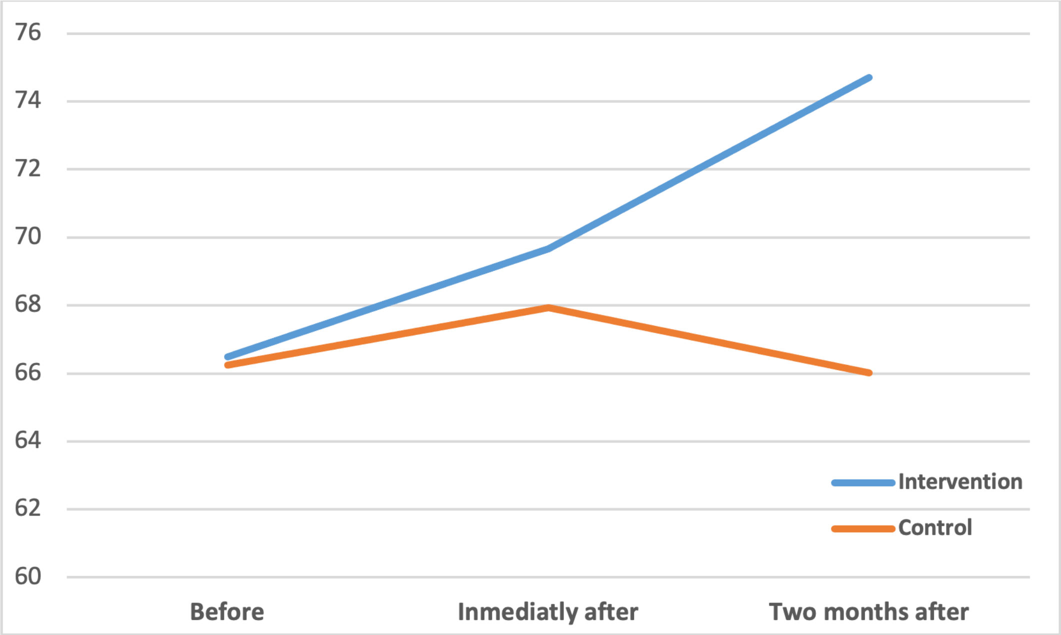

Diagram 1. Total mean scores of resilience before, immediately, and two months after the intervention in the two groups

Discussion

The findings of this research showed that in the intervention group, the mean resilience of the nurses immediately and two months after the intervention improved compared to before the intervention; however, a significant difference was not observed in the resilience of the control group. This findings revealed significant improvements in mean resilience from baseline to two months after the intervention, while between time points in the control group was not significant difference. Research has shown that positive thinking gratitude programs promote resilience in caregivers. The results suggest that such programs can help improve nurses' resilience and its dimensions over time, especially in the post-COVID-19 pandemic. Matel-Anderson *et al.*(16) performed a cross-sectional and correlational study on 131 college students those results suggested an impact of self-esteem on resilience using positive thinking. Results from Mehafarid *et al*.(17) This study found that positive thinking education influenced nurses' resilience, resiliency, and burnout. Also, the studies showed optimism training and positive thinking in the form of past life events and modifying them by setting positive goals for the future, has been effective in increasing self-efficacy, meaning and hope for life and well-being of individuals.(18) In the studies such as Seligman *et al.,*(19) and Luthans *et al.*(20) the impact of positive thinking education psychological intervention plan in improving work quality and resilience in hard working conditions as well as the positive effect it has on burnout has been considered. This finding that the effectiveness of positive thinking and optimism teaching techniques was consistent with present research including McCalister *et al.*(21) and Friborg *et al.*(22) The findings of the present study and related studies show that using gratitude programs based on positive thinking over a longer period of time can have better effects on improving the resilience and psychological state of the participants. Also, the use of gratitude interventions over time leads to a significant increase in individuals' mental, emotional, and physical well-being, because grateful people are more capable than others in terms of forming social commitments, using stress coping skills, and problem-solving.(10) Therefore, in the present study, the difference in resilience scores was greater two months after the end of the intervention.

Explaining this finding, it can be said that positive thinking and optimism training programs aimed at promoting resilience and acceptance or coping with the realities of the coronavirus and its consequences for nurses could increase the resilience rate of nurses. The conclusion of this finding is that people with high resilience, in stressful situations and unfortunate situations such as post-COVID – 19 pandemic, maintain their psychological health and have psychological adaptation, thereby increasing their performance and feeling of satisfaction.(23) Other studies have shown that nurses who have strong positive thoughts feel better. Research has confirmed the effectiveness of positive thinking in improving health tolerance, physical activity, social functioning, and quality of life.(24) Bagheri Charook *et al.*(25) confirm that teaching positive thinking strategies leads to improved functioning and productivity. Hence, in explaining the above results, it can be said that it is significant to pay attention to the characteristics and positive aspects of behaviors instead of focusing on the weaknesses and negative aspects of behavior.

The study findings highlighted that positive thinking programs lead to the promotion of resilience in nurses. Enhancing resilience in nursing, especially during times of crisis and after that, has an effective role in increasing the spirit of nursing as well as the quality of nursing care. This study emphasizes that the use of social media education in the post-crisis era allows nurses to engage with positive thinking content and improve their resilience in order to enhance their knowledge and practice. Positive thinking programs may help with motivation and retention among health professionals. Gratitude programme based on positive thinking is associated with a healthy work environment among nurses.

From the limitations of the current research is that the samples were chosen trough census, therefore the future researches would rather to be executed on a more nurses and trough random sampling. Another limitation of this study is that only one instrument was used to assess the resilience.

Conclusion. The findings provide evidence for the use of a gratitude programme based on positive thinking, to increase resilience in nurses in the post-Coronavirus 2019 era. This study also shows the importance and potential of social media programs in positive thinking and resilience educational curricula.

Acknowledgments. We thank all nurses who participated them to conduct this study.

Funding. This research has been supported by the Jahrom University of Medical Sciences.

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Appendix

The gratitude training program based on positive thinking in 28 days in the intervention group

Day 1: Count Your Blessings: “better to count blessings than to lose blessings to counting your troubles”

Day 2: Magic Rock: Find a rock/stone-small to fit in the palm, smooth. Put where you can see it –near bed.

Day 3: Magical relationships: People with gratitude have better relationships in family, with friends, in office, outside.

Day 4: magical Health. Thank you for everything in the body-list

Day 5: Magic Money If you have lack of money, worry, envy, jealousy, disappointment, discouragement, doubts, fear, keep it more away.

Day 6 : Works like magic “ If you take any activity, any skill-take it & push it as far it goes & push it beyond where it has never been before, push it beyond the edges of edges, then you force it in the realm of magic”. Tom Robbins.

Day 7: Magical Way out of Negativity a thankful person is thankful under any circumstances. It is impossible to be / critical/blame/sad, when you are grateful. First, as difficult as it may be, you have to look for things to be grateful for in a situation. No matter how bad things are, you can always find something to be grateful for.

Day 8: Magic Ingredient be grateful for food and drink, every time you eat or drink something.

Day 9: Money Magnet Complaint makes you poorer, gratitude-richer. True for money/happiness.

Day 10: Magic Dust Everyone Ancient spiritual teaching: What we give to others with full heart returns multiplied many fold.

Day 11: Magic Morning When you arise in the morning, think of what a privilege it is to be alive, to think, to enjoy, to love.

Day 12: Magical People Who Made a Difference “At times, our own light goes out and is rekindled by a spark from another person”. Each one of us has a cause to think with deep gratitude of those who have lighted the flame within us. Albert Schweitzer (Nobel Peace prize winner).

Day 13: make All Your Wishes Come True Gratitude is a must both before and after you receive something. Normally we do it only after receiving.

Day 14: Have a magical Day In the morning, before getting out of bed, or shaving, shower, list plans for the day & say 'Thank You' for each one going well. Wipes out unexpected problems and difficulties.

Day 15: Magically Heal Your Relationships when we have difficult relationship, these can improve ONLY when we are grateful to the other person at least for a few things. Blame, anger or hatred makes relationships worse. These burn your life. Gratitude heals.

Day 16: Magic and Miracles in Health Gratitude's magical power increases the natural flow of health to the mind and body & assists quick healing. Helps other body care: Exercise, medicines, good food.

Day 17: The magic Check When you direct gratitude's magical power toward any condition, a new condition is created, eliminating the old.

Day 18: The Magical To-Do List Every day we seem to have so many things to do that we feel overwhelmed. Applies to everyone, even a house wife. When we don't know what to do, where to start, we feel depressed, and tend to give up.

Day 19: Magical Footsteps-Very Good Mood Lifter A hundred times every day I remind myself that my inner and outer life depend on labors of other men, living/dead, & that I must exert myself in order to give back in some measure, as I have received, and am still receiving.

Day 20: Heart Magic Focus your mind on the area of heart. Close your eyes as you say, ' Thank You'. Gratitude leads to harmony resulting in improved immune system and health.

Day 21: Magnificent Outcomes Say grace before any important activity you want to be successful, interview, exam, lecture, meeting, purchase.

Day 22: Before Your Very Eyes Practice: 1. Count your blessings 2. Start of the day: Take your top 10 desire list. Read each desire & for one minute imagine & visualize that desire to be fulfilled. Feel gratitude. 3. Carry desire list. On two occasions; read and feel gratitude 4. Magic Rock.

Day 23: The Magical Air That You Breathe Practice: 1. Count Blessings 2. Five times today, stop and think about the glorious air that you breathe. Take five deliberate breaths, and feel the air going in/out and joy. 3. Magic Rock.

Day 24: The Magic Wand- IMPORTANT-But see if it can be made better People who wait for a magic wand fail to see that THEY ARE THE MAGIC WAND. Thomas Leonard (Life Coach).

Day 25: Cue the magic: Very Good Use people, circumstances, events that surround you daily to provide clues to be grateful for. E.g. Ambulance -Thank you for good health, Police- Thank You for safety.

Day 26: Magically Transform Mistakes into Blessings- Very Good Turn wounds into wisdom Oprah Winfrey.

Day 27: Magic Mirror- Very Good "The appearance of things changes according to the emotions, and thus we see magic and beauty in them, while the magic and beauty are really in ourselves" Kahlil Gibran.

Day 28: Remember The Magic "That's the thing with magic you have got to know/feel. It is still here, all around us, or it just stays invisible for you". Charles de Lint In the morning, remember yesterday's blessings. Make a list, say aloud. If you can't find many for the previous day, find from previous days.

Also, Positive thinking training programs including the following according to Seligman were used in the training sessions:

1. Explanation of procedures and reasons for our specific selections, introduction to the concept of positive thinking, group introductions and a review of rules
2. Factors affecting health, familiarity with changeable and unchangeable elements in life
3. Steps to accepting the unchangeable conditions of life, ways to deal with unchangeable conditions in life

4. Ways to overcome depression, specification of values and goals in life
5. Assessment of satisfaction with life and the ability to live happily, being positive by challenging negative thoughts, use of productive language and reconsideration in beliefs
6. Anger Management
7. Connecting with the present time through mindfulness meditation
8. Experiencing the present time through mindfulness and a recapitulation of contents presented during the course

Original Article

Understanding the Mental Health of Students and Professors within Universities: a Cross-sectional, Multicultural Analysis across Three European Countries

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Conflicts of interest: None.

Received date: September 15th, 2024.

Approval date: February 14th,2025.

How to cite this article: García-Salido C, Ramírez-Baraldes E, Miedaner F, Hasseler M, Hlubučková A, García-Gutiérrez D. Understanding the Mental Health of Students and Professors within Universities: a Cross-sectional, Multicultural Analysis across Three European Countries Invest. Educ. Enferm. 2025; 43(1):e08.

DOI: https://doi.org/10.17533/udea.iee.v43n1e08

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UNIVERSIDAD DE ANTIOQUIA
1803

Investigación y Educación en Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Understanding the Mental Health of Students and Professors within Universities: a Cross-sectional, Multicultural Analysis across Three European Countries

Abstract

Objective. To analyze the relationship among the professional role (student or professor), geographic location, and mental health in the university community after the COVID-19 pandemic. **Methods.** Quantitative cross-sectional study conducted at universities in Spain, Germany, and the Czech Republic. Non-probability convenience sampling was used, obtaining a sample of 449 participants (372 students and 77 professors). Mental health was assessed using the Scale for Mood Evaluation (EVEA), measuring sadness-depression, anxiety, anger-hostility, and happiness. **Results.** Significant differences were found between students and professors, with students reporting higher levels of sadness-depression (3.8 vs. 2.4; $p<0.001$), anxiety (4.6 vs. 2.9; $p<0.001$), and anger-hostility (3.4 vs. 2.5; $p<0.01$). Professors showed higher levels of happiness (6.7 vs. 5.4; $p<0.001$). In addition, differences among countries were observed: participants from Spain showed higher levels of sadness-depression and anxiety compared to Germany and the Czech Republic. **Conclusion.** University students have greater emotional vulnerability than professors, highlighting the need for differentiated psychosocial support strategies in the academic setting.

Descriptors: mood; student health; university professor; COVID-19; pandemics.

Comprensión de la salud mental de estudiantes y docentes en universidades: un análisis transversal y multicultural en tres países europeos.

Resumen

Objetivo. Analizar la relación entre el rol profesional (estudiante o profesor), la ubicación geográfica y la salud mental en la comunidad universitaria tras la pandemia de COVID-19. **Métodos.** Estudio transversal cuantitativo realizado en universidades de España, Alemania y República Checa. Se utilizó un muestreo no probabilístico de conveniencia, obteniendo una muestra de 449 participantes (372 estudiantes y 77 profesores). La salud mental se evaluó mediante la Escala de Evaluación del Estado de Ánimo (EVEA), midiendo tristeza-depresión, ansiedad, ira-hostilidad y felicidad. **Resultados.** Se encontraron diferencias significativas entre estudiantes y profesores, con los estudiantes reportando niveles más altos de tristeza-depresión

(3.8 vs. 2.4; $p<0.001$), ansiedad (4.6 vs. 2.9; $p<0.001$) e ira-hostilidad (3.4 vs. 2.5; $p<0.01$). Los profesores mostraron mayores niveles de felicidad (6.7 vs. 5,4; $p<0.001$). Además, se observaron diferencias entre países: los participantes de España presentaron mayores niveles de tristeza-depresión y ansiedad en comparación con Alemania y la República Checa. **Conclusión.** Los estudiantes universitarios presentan mayor vulnerabilidad emocional que los profesores, lo que resalta la necesidad de estrategias diferenciadas de apoyo psicosocial en el ámbito académico.

Descriptores: estado de ánimo; salud del estudiante; profesor universitario; COVID-19; pandemias

Compreendendo a saúde mental de estudantes e professores em universidades: uma análise transversal e multicultural em três países europeus

Resumo

Objetivo. Analisar a relação entre papel profissional (aluno ou professor), localização geográfica e saúde mental na comunidade universitária após a pandemia de COVID-19. **Métodos.** Estudo transversal quantitativo realizado em universidades na Espanha, Alemanha e República Tcheca. Foi utilizada uma amostragem não probabilística por conveniência, obtendo-se uma amostra de 449 participantes (372 alunos e 77 professores). A saúde mental foi avaliada usando a Escala de Avaliação de Humor (EVEA), medindo tristeza-depressão, ansiedade, raiva-hostilidade e felicidade. **Resultados.** Diferenças significativas foram encontradas entre alunos e professores, com os alunos relatando níveis mais altos de tristeza-depressão (3.8 vs. 2.4; $p< 0.001$), ansiedade (4.6 vs. 2.9; $p< 0.001$) e raiva-hostilidade (3.4 vs. 2.5; $p< 0.01$). Os professores apresentaram níveis mais elevados de felicidade (6.7 vs. 5.4; $p< 0.001$). Além disso, foram observadas diferenças entre os países: os participantes da Espanha apresentaram níveis mais altos de tristeza-depressão e ansiedade em comparação à Alemanha e à República Tcheca. Conclusão. Estudantes universitários são mais vulneráveis emocionalmente do que professores, o que evidencia a necessidade de estratégias diferenciadas de apoio psicossocial no âmbito acadêmico.

Descritores: afeto, saúde do estudante; professor universitário; COVID-19; pandémies

Introduction

Detection of a new coronavirus (SARS-CoV-2) in Hubei province, China, in late 2019, and its rapid global spread prompted the World Health Organization (WHO) to declare COVID-19 a pandemic in March 2020. Although confinement and social distancing measures reduced transmission, these had negative repercussions on the population's mental health, leading to increased symptoms of stress, anxiety, and depression.(1) The academic environment was not immune to this crisis: the sudden transition from face-to-face teaching to the virtual or hybrid modality generated overload and emotional affectation in students and professors, given technological limitations and lack of planning.(2) With the transition to the so-called "new normal" – a partial return to face-to-face teaching – fears arose about possible contagion, concern about learning backlogs and difficulties in adapting to restructured teaching methodologies. Numerous studies on student mental health have investigated risk factors, like the absence of support networks, living independently, and being the "first in the family" to attend university.(3,4) For example, Horita *et al*.,(4) reported that, although "high-risk" depression decreased in Japanese first-year students compared to previous cohorts, "academic distress" caused by virtual education increased. Similarly, in the United States, higher rates of anxiety, depression, and suicidal ideation were detected in those lacking social support or who assumed family responsibilities.(5) Other works, such as those by Varela *et al*.,(6) confirm that the pandemic impacted heterogeneously in different universities, evidencing the need to broaden the research perspective.

Despite increasing literature on mental health in the university population, the faculty staff remains a less explored group. Some indications point to the increased workload and emotional demand of professors, caused by the hasty adoption of technological tools and the need for greater accompaniment of students.(7) Nevertheless, few comparative studies simultaneously assess the emotional well-being of professors and students, making it difficult to create tailored support strategies. This void becomes relevant when recalling that the professor's mental well-being impacts upon the quality of teaching and, in turn, on students' performance.

On a more general level, university is described as a period of high susceptibility to mental disorders, particularly depression, anxiety, and substance use.(1-7) The pandemic outbreak acted as a triggering or amplifying factor of such problems, underlining the urgency of institutional approaches to prevention and containment. The WHO's Comprehensive Mental Health Action Plan 2013-2030 had warned about the importance of training undergraduate and graduate professionals to recognize and provide early care for mental health disorders.(8) Similarly, research, such as that by Gestsdottir *et al*.,(9) emphasizes the relevance of socioemotional support and the presence of protective factors, highlighting the need for contextualized interventions.

Within this context, focusing on nursing is especially important, given the strategic role of nurses in direct patient care, health education, and in promoting well-being within communities. Strong faculty and a mentally healthy student body are crucial for ensuring quality education, which – in turn – leads to enhanced clinical competencies and greater responsiveness to health emergencies. It is, therefore, necessary to understand how the pandemic affected both educators and learners to design effective psychoeducational interventions tailored to their needs. Are there differences in mental health among different European countries in the higher education setting two years after the onset of the COVID-19 pandemic, and does the emotional state of educators and students vary significantly within the same context?

To answer these questions, the aim of this study was to analyze the mental health of students and educators in three European countries, using the Scale for Mood Evaluation (EVEA), two years after the onset of the pandemic. This involves comparing sadness-depression, anxiety, anger-hostility, and happiness levels in both groups, examining the influence of sociodemographic factors, such as age, gender, or experience of isolation and assessing the implications of the results for nursing education and practice. Hopefully, this approach will contribute to outline strategies for the promotion and prevention of mental health in the university community, strengthening the quality of training of future health professionals and the resilience of health systems in the event of future crises.

Methods

Study design and participants. A cross-sectional quantitative study was conducted in the faculties of Health and Life Sciences at universities in three European countries (the Czech Republic, Germany, and Spain). Non-probability convenience sampling was used, selecting participants from among students and professors who met the inclusion criteria and agreed to participate in the study. Thus, students could participate if they were enrolled in one of the study programs offered at the participating faculty during the 2022/2023 academic year. Faculty were included in the survey if they had been actively teaching in one of the programs offered since at least the 2019-2020 academic year (including the 2022/23 academic year). In addition, all participants had to be 18 years of age or older. Participants who did not complete the entire questionnaire and those who did not provide informed consent were excluded from the study. The response rate was 64.4%, ensuring a representative sample within the study context. The study was approved by the institutional ethics committees and was conducted in compliance with international human research regulations. Participants were informed of the study objectives, procedures, and their right to withdraw their participation at any time. Informed consent was obtained by means of an electronic form before answering the survey, guaranteeing their voluntary participation, the confidentiality of the data, and their treatment in accordance with the General Data Protection Regulation (GDPR) of the European Union. Due to differences in the accessibility of the participants and in the response rate per country, the distribution of the sample was not homogeneous. This aspect should be considered when interpreting the results and comparing among the countries evaluated.

Data collection. Data was collected via a self-administered electronic survey, conducted between November and December 2022. The questionnaire included: (i) sociodemographic information, such as professional role (student or professor), age, sex, country of origin, size of locality of residence, and experience of confinement during the COVID- 19 pandemic (March-June 2020); (ii) participants' mental health assessed by the Scale for Mood Evaluation (EVEA), developed by Sanz,(10) designed to measure four clinically relevant emotional dimensions: sadness-depression, anxiety, anger-hostility, and happiness. The EVEA consists of 16 items, each composed of an 11-point Likert-type graphic scale (0 = not at all, 10 = very much), with statements beginning with the phrase “I feel” followed by an adjective reflecting the corresponding emotional state (*e.g.*, “I feel sad”, “I feel happy”). The adjectives used to assess sadness-depression and happiness come from the Spanish version of the Depression Adjective List,(11) while the items for anxiety were taken from the State-Trait Anxiety Inventory.(12) The anger-hostility subscale was elaborated from the translated version of the State-Trait Anger Scale.(13) The EVEA has been validated in Spanish population and has been used in studies on cognition, emotional disorders, and mood assessment in clinical and educational settings.(14-16) Its applicability in measuring the emotional impact of the pandemic has been confirmed in previous research.(17)

Regarding its psychometric properties, the EVEA has demonstrated adequate validity and reliability in prior studies. Herein, internal consistency, measured through Cronbach’s alpha coefficient (α), was excellent for sadness-depression (α = 0.89) and anxiety (α = 0.90), and good for anger-hostility (α = 0.86) and happiness (α = 0.86).(17) The specific values obtained in the Spanish sample, as well as in the subgroups of students and professors, are detailed in the results.

Statistical analysis. Analysis of variance (ANOVA) was used to test whether significant differences existed in each subscale between (i) the mental health of university students and professors and (ii) the mean mental health of participants in the different countries. A second step contrasted whether these differences remained significant after adjusting for selected sociodemographic variables (age, sex, size of residence and whether the participant was confined during the pandemic or not) using multiple linear regression models for each mental health subscale. Statistical analyses were performed with Stata V.17 (College Station, Texas, USA).

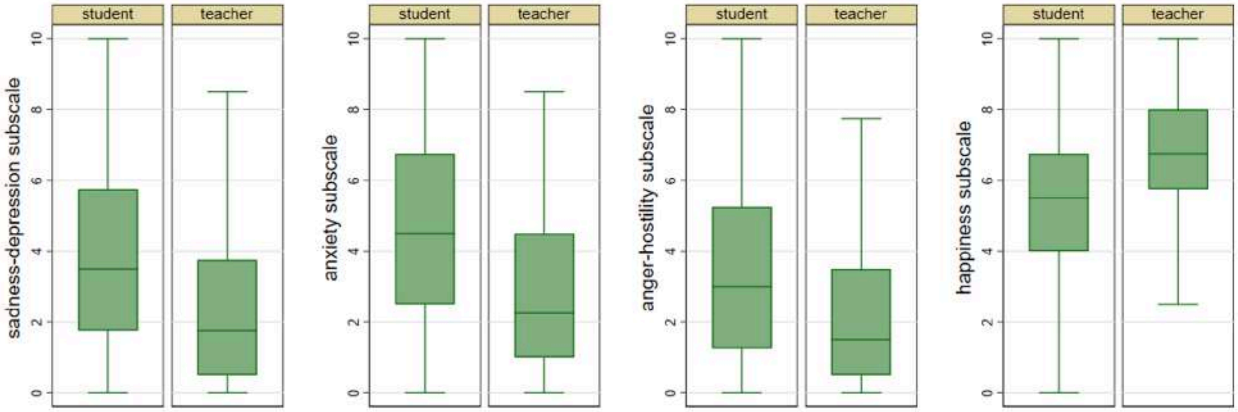
Results

The survey was completed by 449 participants, distributed among 372 students (82.85%) and 77 professors (17.15%). The geographical distribution revealed that the majority of participants came from Spain (63.25%), followed by Germany (22.49%) and the Czech Republic (14.25%). In terms of age, 49.73% of the students were between 18 and 22 years old, reflecting a predominantly young sample. In contrast, most of the faculty were in higher age ranges, with a gradual increase in representation starting from age 33 onwards. With respect to gender, 59.91% of the sample identified as male, 39.64% as female, and 0.45% as intersex. Although the distribution within each group was relatively balanced, there was greater male representation among the students. Regarding the residential environment, 47.88% of the participants resided in cities with more than 60,000 inhabitants, while 23.83% lived in towns with less than 10,000 inhabitants. A relevant finding was the high prevalence of confinement experiences during the pandemic with 367 participants (81.73%) reporting being in isolation between March and June 2020.Table 1 presents a detailed breakdown of these sociodemographic characteristics, providing a more accurate picture of the composition of the sample.

Table 1. Descriptive statistics of the sample according to professional function

Variable	Students n (%)	Professors n (%)
Age in years		
18-22	185 (100)	0
23 - 27	94 (96.91)	3 (0.31)
28 - 32	22 (73.33)	8 (26.67)
33 - 37	18 (56.25)	14 (43.75)
38 - 42	18 (58.06)	13 (41.94)
43 - 47	18 (64.29)	10 (35.71)
48 - 51	12 (60)	8 (40)
52 - 57	5 (31.25)	11 (68.75)
58 - 61		4 (100)
62 - 65		4 (100)
> 65		2 (100)
Gender		
Male	219 (81.41)	50 (18.59)
Female	151 (84.83)	27 (15.17)
Intersex	2 (100)	
Country of origin		
Spain	225 (79.23)	59 (20.77)
Germany	90 (89.11)	11 (10.89)
Czech Republic	57 (89.06)	7 (10.94)
Number of inhabitants of the place of residence		
< 10.000	89 (83.18)	18 (16.82)
10.001 - 20.000	55 (88.71)	7 (11.29)
20.001 - 40.000	29 (80.56)	7 (19.44)
40.001 - 60.000	26 (89.66)	3 (10.34)
> 60.001	173 (80.47)	42 (19.53)
Have you been isolated because of Covid?		
No	70 (85.37)	12 (14.63)
Yes	302 (82.29)	65 (17.71)
Total	372 (82.85)	77 (17.15)

Based on the sample's characterization, the differences in mental health between students and professors, as well as among the countries evaluated, were analyzed. Overall, it was noted that the mental health of the participants showed significant differences both between professors and students and among the countries analyzed. Analysis of variance (ANOVA) showed that mental health was significantly worse in students compared to professors in the four subscales assessed. In the sadness-depression dimension, students obtained a mean value of 3.8, while professors recorded 2.4 ($p<0.001$). Similarly, in the anxiety subscale, students presented a mean of 4.6, in contrast to 2.9 in professors ($p<0.001$). As for anger-hostility, students showed a mean value of 3.4 versus 2.5 in professors ($p<0.01$). Finally, in the happiness dimension, students obtained an average of 5.4, while professors reached 6.7. These results show that students experience significantly higher levels of sadness-depression, anxiety, and anger- hostility compared to professors. Moreover, professors reported higher levels of happiness, suggesting better emotional stability in this group. Figure 1 presents a visual summary of these differences, highlighting the gap in mental health between students and professors, as well as the variations among the countries evaluated.



This Figure shows a clear difference in mental health levels between students and professors, with students having higher levels of sadness-depression, anxiety, and anger-hostility, and lower levels of happiness. However, when analyzing the differences according to country of origin, distinctive patterns are observed in all subscales, except for anger-hostility, where the differences were not significant. In particular, statistically significant differences were found in sadness-depression ($p<0.01$), anxiety ($p<0.01$), and happiness ($p<0.001$) among the countries evaluated

Figure 1. Mental health differences between students and professors

Figure 2 illustrates the differences in mental health between students and professors in each country, highlighting that Spain has the highest levels of sadness-depression and anxiety, while Germany and the Czech Republic report lower values in these dimensions. Nevertheless, happiness in the German participants was significantly lower compared to that of the Spanish participants.

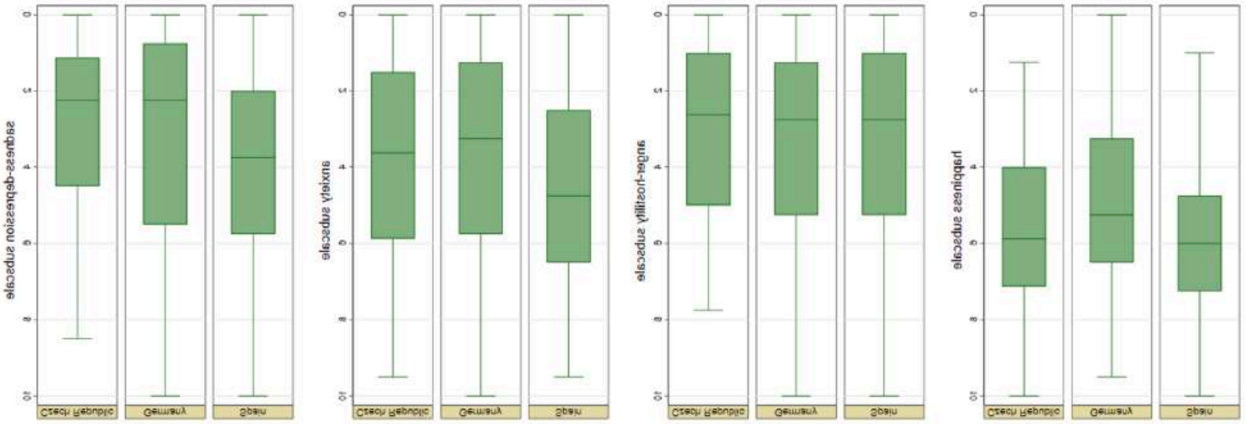


Figure 2. EVEA differences between students and professors by country

After adjusting for sociodemographic variables, like age, gender, size of locality of residence, and experience of isolation during the pandemic, differences in mental health between students and professors remained statistically significant. Compared to professors, students had higher levels of sadness-depression (ß = 1.157, $p<0.01$), anxiety (ß = 1.373, $p<0.01$), and anger-hostility (ß = 1.102, $p<0.01$), in addition to lower levels of happiness (ß = -1.509, $p<0.01$). These findings suggest that students experience greater emotional vulnerability, possibly influenced by academic uncertainty, performance pressure, and less consolidation of coping strategies in crisis situations. Regarding differences among countries, taking Spain as the reference category, the results of the regression model indicated that participants from Germany and the Czech Republic reported significantly lower levels of sadness-depression and anxiety compared to their peers in Spain. Nonetheless, German participants also reported lower levels of happiness than those observed in Spain, suggesting the influence of sociocultural factors on the perception of emotional well-being. (Table 2)

Table 2. Results of multiple linear regression for each of the EVEA subscales

Variables	Sadness-depression ß (EE)	Anxiety ß (EE)	Anger-hostility ß (EE)	Happiness ß (EE)
Professional Function (Reference: professors)	1.157 (0.41)***	1.373 (0.419)***	1.102 (0.42)***)	-1.509 (0.319)***
Country (Reference: Spain)				
Germany	-0.883 (0.351)**	-0.966 (0.358)***	-0.113(0.359)	-0.731 (0.273)***
Czech Republic	-0.985 (0.4)**	-0.981 (0.409)**	-0.281(0.409)	0.007 (0.311)
Gender (Reference: men)	0.12 (0.284)	0.091 (0.29)	0.015 (0.29)	0.1 (0.22)
Age	-0.111 (0.068)	-0.121 (0.07)*	0.046 (0.07)	-0.076 (0.053)
Size from city of residence. (Reference: <10 000 inhabitants)	0.08 (0.07)	0.134 (0.072)*	0.024 (0.072)	0.041 (0.055)
Isolation during the pandemic (Reference: Not isolated)	0.179 (0.311)	0.171 (0.318)	0.266 (0.319)	-0.005 (0.242)
Constant	2.69 (0.708)***	3.137 (0.723)***	1.932 (0.724)***	6.977 (0.55)***
Remarks	424	422	424	423
R-squared	0.092	0.111	0.022	0.095

* ß = regression coefficient; SE = standard error. $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Values without asterisks did not reach statistical significance. Percentages may not add up to exactly 100% due to incomplete responses.

Discussion

The results of this study shed light on significant differences in emotional dimensions between students and professors, which may bear important implications to understand and address mental health and well-being in the educational setting. The following will discuss the main results and their relevance within the context of existing literature.

First, with respect to the sadness-depression dimension, it was observed that students reported significantly higher levels compared to professors. This finding is consistent with previous research that has noted the prevalence of depression in college students due to academic demands, life transitions, and social pressures. Early detection and intervention of sadness and depression among students may be essential to promote their emotional well-being and academic performance.(18,19)

Second, in relation to anxiety, the results indicate that students also experience higher levels of anxiety compared to professors. This discrepancy can be explained by the academic pressure to which students are exposed, such as exams, deadlines, and uncertainty about their future. Anxiety in the educational environment can affect negatively the quality of life and academic performance.

Therefore, it is critical for educational institutions to implement anxiety management and support strategies for their students.(20,21)

Third, regarding the anger-hostility dimension, students reported higher levels than professors. This difference could be related to age and power dynamics in the classroom. The students may experience frustration and hostility due to lack of control over their educational environment and tensions among peers. Effective anger management and promotion of conflict resolution skills are important areas of emotional development within the student context.(22) Finally, in terms of happiness, professors reported higher levels than students. This could be related to job satisfaction and accumulated teaching experience. Professors, having more experience in the educational system, may have developed effective strategies to cope with stress and maintain a work-life balance.(23,24) The results herein have relevant implications for health sciences education and, particularly, for nursing education. The high prevalence of anxiety and depression symptoms in university students highlights the need to enhance psycho-emotional support programs within educational institutions. From a formative perspective, it is essential for nursing programs to incorporate strategies that foster emotional resilience and mental well-being in future health professionals. Likewise, given that professors reported higher levels of emotional well-being, their role as agents of support and containment in educational settings takes on special relevance. These findings suggest the importance of developing interventions focused on students and professors to optimize the quality of teaching and the training of health professionals with greater coping skills during crisis situations. In this sense, nursing, as a discipline, plays a fundamental role in the design and implementation of mental health promotion strategies within universities, which could contribute to improving the academic performance and emotional stability of future generations of health professionals.

Furthermore, our results reveal that both sadness-depression and anxiety were significantly related to the variables of professional role and geographic location in Spain. These results are consistent with previous research pointing to the influence of the role played by individuals on their emotional well-being. Specifically, participants who reported playing specific roles seem to experience higher levels of sadness-depression and anxiety. This could be related to the responsibilities and expectations associated with those roles. Additionally, the influence of geographic location, specifically Spain, on sadness-depression and anxiety is an intriguing finding. This could indicate the existence of cultural or contextual factors unique to Spain that affect the population's emotional health.(25,26)

In contrast, the anger-hostility subscale only revealed a significant relationship with professional status (professors vs. students) with no significant differences among countries. This finding could suggest that the experience of anger and hostility is more linked to the perception of the role played by individuals than to geographical factors. It is important to further study how role expectations and role demands can trigger negative emotions such as anger.(27)

In terms of happiness, significant associations were found with occupational role and with the geographical locations of Spain and Czechia. Individuals in specific roles appeared to experience diverse levels of happiness, while participants from different regions, particularly Spain and Czechia, showed significantly divergent levels of happiness. These results suggest that individual and contextual factors significantly influence happiness; therefore, it is crucial to take into account a number of variables when examining emotional experiences and coping mechanisms, as well as to recognize sociocultural definitions of happiness. Overall, these results underscore the impact of personal and cultural factors on individuals' emotional well-being.(28)

From the differences between professors and students, suggesting that the mental health of professors is significantly better than that of students in all subscales assessed in this study, several reasons can be inferred. One possible explanation may be the different stressors faced by professors and students. While professors tend to have more stable working conditions and control over their work environment, students may face higher levels of uncertainty and pressure associated with academic demands and future employment.(7) Another factor may be differences in experience and age group, which influence individual coping skills and emotions.

Significant differences underscore the need to address and support the mental well-being of professors and students in educational settings. Finally, initial results suggest that the role played in the educational environment can have a significant impact on the mental health of individuals. Furthermore, these findings reinforce the idea that the academic environment not only influences student performance and training, but also impacts upon the mental health of those in the educational community. Grasping the influence of these factors is crucial for crafting university policies that prioritize emotional health. This study offers an empirical foundation for future research aimed at delving deeper into the determinants of well-being in educational settings and identifying the most effective strategies for its promotion.

This study has several limitations that should be considered when interpreting the results. First, its cross-sectional design precludes establishing causal relationships among professional role, geographic location, and mental health. Future longitudinal studies would make it possible to evaluate the evolution of emotional well-being in university communities. Second, the non-probabilistic convenience sampling limits the representativeness of the findings, restricting their generalizability to other university contexts. Expanding the sample in future research, by incorporating institutions from different countries and sociocultural contexts, would improve external validity. Also, the use of self-reports may have introduced social desirability biases and recall errors. Future studies could complement these data with psychophysiological measures or clinical assessments for greater objectivity. Another limitation was the lack of control over external factors, such as differences in academic load, psycho-emotional support systems, and access to mental health services, which could have influenced the results. Lastly, this study did not thoroughly investigate additional variables, such as teaching workload or student coping strategies, which are key aspects for a better understanding of emotional well-being in higher education.

Despite these limitations, the findings highlight the need for differentiated strategies to improve mental health in university settings and serve as a basis for future research with more robust methodological approaches.

The conclusion of this study is that significant differences exist in mental health between students and faculty members, with faculty consistently presenting lower levels of sadness-depression, anxiety, and anger-hostility and higher scores in happiness. These differences underscore the necessity of addressing university mental health with tailored strategies, taking into account the unique characteristics of each group and their effect on the quality of the educational process.

The results highlight that students show greater emotional vulnerability, underlining the importance of interventions aimed at strengthening their well-being. The high prevalence of depressive and anxious symptomatology in this group could be linked to academic and professional uncertainty, performance-related stress, and lack of consolidated coping strategies. In contrast, professors, although more emotionally stable, also face psychological challenges that may affect their performance and, therefore, the educational experience of students.

From an applied perspective, these findings have direct implications for health sciences education and nursing education. Promotion of emotionally healthy learning environments is critical to ensure the well-being of the student body and the quality of teaching. Thus, as a discipline, nursing should actively participate in developing strategies for the early identification of risk factors and the implementation of psychosocial intervention programs in university settings. Future studies should delve deeper into the factors that influence the relationship between the educational environment and mental health. Additionally, these should focus on developing preventive initiatives and support programs tailored to the needs of professors and students. This will not only enhance emotional well-being within the educational community but also boost the university system's resilience in the face of future crises.

Future studies should explore the factors that influence the relationship between the educational environment and mental health. Furthermore, emphasis should be made on creating preventive initiatives and support programs specifically designed to meet the needs of professors and students. This will not only enhance emotional well-being within the educational community, but also bolster the university system's resilience against future crises.

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Review

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Health Sciences Students: Witnesses of Discrimination in the Care of Foreign Patients in Chile

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Health Sciences Students: Witnesses of Discrimination in the Care of Foreign Patients in Chile

Abstract

Objective. This work sought to inquire on the perception of Health Sciences students about the health care provided to patients of foreign origin in clinical environments. **Methods.** Phenomenological approach with multiple case study design. Health Sciences students from three Chilean universities participated with intensity sampling. Semi-structured interviews were conducted via Zoom after the consent was signed. Data analysis included open and axial coding axial with the aid of the ATLAS.ti 24 software. **Results.** The study had the participation of 106 students, who identified different types of discrimination, besides diverse exclusion manifestations that take place during the care process, such as: apathy, prejudice/stereotyping, derogatory comments, evading, underestimating, normalizing discrimination, infantilizing, and scoffing. Some of the participants normalized these behaviors

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Conflicts of interest: None

Received: October 17th, 2024.

Approved: January 28th, 2025.

How to cite this article: Álvarez-Cruces DJ, Aneas-Álvarez A, Nocetti-de-la-Barra A, Mansilla J. Health Sciences Students: Witnesses of Discrimination in the Care of Foreign Patients in Chile. Investigación y Educación en Enfermería. 2025; 43(1):e09.

DOI: https://doi.org/10.17533/udea.iee.v43n1e09

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

due to the overload health system. **Conclusion.** The Health Sciences students witnessed several types of discrimination and exclusion manifestations occurring during the care process, highlighting apathy and evading as characteristic of the clinical environment, which could favor negative vicarious learning that perpetuates discriminatory conducts against foreign patients.

Descriptors: professional training; Health Sciences; disparities in health care; perceived discrimination; migrants

Estudiantes de Ciencias de la Salud: Testigos de discriminación en la atención de pacientes extranjeros en Chile

Resumen

Objetivo. Indagar en la percepción del estudiantado de Ciencias de la Salud sobre la atención sanitaria proporcionada a los pacientes de origen extranjero en los ambientes clínicos. **Métodos.** Enfoque fenomenológico con diseño Estudio de Caso Múltiple. Participaron estudiantes de Ciencias de la Salud de tres universidades chilenas seleccionados con muestreo por intensidad. Se realizaron entrevistas semiestructuradas por Zoom luego de firmar el consentimiento. El análisis de los datos incluyó codificación abierta y axial con la asistencia del software ATLAS.ti 24. **Resultados.** Participaron 106 estudiantes, quienes identificaron diferentes tipos de discriminación, además de diversas manifestaciones de exclusión que ocurren durante el proceso de atención, como: desidia, prejuicio/estereotipo, comentarios despectivos, eludir, menospreciar, normalizar la discriminación, infantilizar y burlarse. Algunos de los participantes normalizaron estos comportamientos debido a la sobrecarga del sistema sanitario. **Conclusión.** El estudiantado de Ciencias de la Salud fue testigo de varios tipos de discriminación y manifestaciones de exclusión que ocurren durante el proceso de atención, destacaron la desidia y eludir como propias del ambiente clínico, lo cual podría favorecer un aprendizaje vicario negativo que perpetúe conductas discriminatorias a pacientes extranjeros.

Descriptores: formación profesional; ciencias de la salud; disparidades en atención de salud; discriminación percibida; migrantes.

Estudantes de Ciências da Saúde: Testemunhas de discriminação no atendimento a pacientes estrangeiros no Chile

Resumo

Objetivo. Investigar a percepção de estudantes de Ciências da Saúde sobre o atendimento à saúde de pacientes de origem estrangeira em ambientes clínicos. **Métodos.** Abordagem fenomenológica com delineamento de estudo de caso múltiplo. Participaram estudantes de Ciências da Saúde de três universidades chilenas, selecionados por amostragem de intensidade. Entrevistas semiestruturadas foram conduzidas via Zoom após assinatura do termo de consentimento. A análise de dados incluiu codificação aberta e axial com o auxílio do software ATLAS.ti 24. **Resultados.** Participaram 106 estudantes, que identificaram diferentes tipos de discriminação, bem como diversas manifestações de exclusão que ocorrem durante o processo de cuidado, tais como: apatia, preconceito/estereótipo, comentários depreciativos, evitação, menosprezo, discriminação normalizadora, infantilização e deboche. Alguns participantes normalizaram esses comportamentos devido à sobrecarga do sistema de saúde. **Conclusão.** Os estudantes de Ciências da Saúde testemunharam vários tipos de discriminação e manifestações de exclusão que ocorrem durante o processo de cuidado, destacando a apatia e a evitação como típicas do ambiente clínico, o que pode favorecer a aprendizagem vicária negativa que perpetua o comportamento discriminatório em relação aos pacientes estrangeiros.

Descritores: formação profissional; ciências da saúde; disparidades em assistência à saúde; discriminação percebida; migrantes.

Introduction

In health training, ethical and moral commitment is promoted to practice the profession without distinctions, focused on respect and the intrinsic value of each person.(1) In addition, the importance of respecting the duties and rights of patients throughout the care process is emphasized. However, scientific evidence indicates implicit discrimination or micro-discrimination that even the person is not able to perceive because they are unaware of such.(2,3) Besides, the health system is often overwhelmed by high demand, which generates burnout and exhaustion among health staff.(4) These work conditions can generate two situations: that the foreign population perceives the system's deficiencies as discrimination or that the staff justifies poor attention due to the fatigue and stress they endure. Objective 17 of the Global Compact for Migration states that "all forms of discrimination must be eliminated and evidence-based public discourse promoted to change perceptions of migration."(5) Consequently, evidence is needed to highlight and expose manifestations of exclusion that occur in health care against the foreign population, which could represent discriminatory acts.

Literature from different parts of the world reports that, in health care, discrimination situations take place, such as: xenophobia, classism, and racism against the foreign population, especially against those considered of lower category,(2,3) a situation that is not different in Chile.(6) Notwithstanding, the manifestations that denote a discriminatory component in health care are unknown. Discrimination implies any exclusion or different treatment to a person product of their origin, gender, religion, age, health condition, or any other situation. Although anyone can be object of discrimination, it is observed that those who endure any disadvantage are those who suffer from it for a longer period of time and more frequently.(3) In the clinical setting, research has centered on knowing the foreign population's perception on the health care received(7,8) and the challenges health professionals have had to face to provide health care to foreigners.(9,10)

The literature reports that medical students diminish their favorable attitudes, altruism, responsibility, and social commitment towards foreigners as they progress through their training, unlike those students who belong to minority groups or who were born in another country.(11) Nursing students report a high score in items of awareness, knowledge, and respect in different questionnaires applied; however, negative attitudes are maintained towards refugees due to factors associated with the patient's gender, age, financial conditions, educational level, and religion despite having intercultural content in their professional training.(12,13) Although qualitative research is recommended to analyze manifestations of discrimination towards foreign patients, research in this field is scarce. One such research analyzes the nature of relationships of empathy, comprehension, and commitment Health Sciences students have when providing care to said group of patients.(14) Another study identified self-management strategies for student competencies, which included respect and comprehension toward the foreign population object of care, despite having had negative modeling by clinical guides or other health professionals who may have carried out discriminatory acts during their professional and teaching practice.(15) Likewise, a recent research indicates that the students observed racism omnipresent in health care, in addition to poor coping strategies when they identified it.(16) This greater sensitivity, openness, and disposition towards disadvantaged groups would be related to the individual's self-reflective capacity.(15,17)

Based on the foregoing, this research was proposed from a qualitative approach to inquire on the perceptions of Health Sciences students about the health care provided to patients of foreign origin in clinical environments.

Methods

This was a phenomenological qualitative study with multiple case study design, which is characterized by analyzing two or more cases on a particular topic because they share common characteristics; however, they differ in some aspects.(18) Thus, three geographically distant universities from Chile were included. The selection of participants was conducted via intensity sampling, so students in the final stage of training or in professional internship in the careers of medicine, midwife, nursing, nutrition, dentistry, pharmacy and kinesiology were selected. The study was approved by two Scientific Ethics Committees accredited in Chile, besides the ethics committees in the university institutions that were part of the research.

A mass invitation, with the informed consent attached, was sent by email to all students. It detailed the objective of the research and the scope the results could have in benefit of improved training of future health professionals. This consent had to be signed prior to scheduling the interview.

The information collection strategy involved a semi-structured interview with eight open-ended questions. This allowed participants to freely express their experiences, appreciations, and evaluations regarding the health care provided to foreign patients and the presence or absence of discrimination. To avoid biasing the participants' responses, the interview began with the following questions: 1- What have been your experiences with foreign patients in health care? 2- How do you feel about the care provided to foreign patients by other members of the health team? 3- Have you observed differences between the care provided to Chilean and foreign patients? 4- During care, was cultural influence on the health/disease process considered? 5- How do you rate the care you provided to foreign patients? Why? If any of the prior questions indicated any discriminatory component against foreign patients in health care, the following questioning was continued: 6- What type of discrimination did you observe during the care process against foreign patients? 7- What attitudes or behaviors do you consider discriminatory against foreign patients in health care? 8- According to your perception, how could care be improved towards foreign patients?

The interviews lasted between 40 and 90 minutes and were conducted via the Zoom platform by the principal researchers, who holds a PhD with post-graduate training in health and education. The files were stored in audio format (MP3) to safeguard the participants' identities. The data analysis included open and axial coding. The first consisted of a deductive phase to identify the types of discrimination reported by the literature, which became categories. Subsequently, a second inductive analysis was conducted to examine the situations reported by the participants that could represent behaviors, attitudes, or circumstances of exclusion in the care of migrants. Through this reflexive and recursive analysis, subcategories were obtained that corresponded to manifestations of discrimination that take place during the care process towards foreign patients. Using the ATLAS.ti 24 software, during axial coding, the types of discrimination were related to the various manifestations perceived to delve deeper into the new forms in which discrimination occurs in health care.

To present the results, the Sankey diagram was preferable over the co-occurrence table, which only provides numerical values. Said diagram evidences in a clearer and more explanatory way the density of the codes and the relationship among them, permitting greater comprehension. During the research, the principles of scientific rigor were upheld. Thus, credibility and confirmability were achieved with an extensive period of data collection to capture the different perspectives on the phenomenon under study, which were subject to the judgment of the informants. In addition to the above, data saturation and triangulation by career and university were achieved. This allowed for an adequate analysis and interpretation of the data, supported by direct quotes from the participants.

Transferability was achieved by including participants from different careers and universities who shared the common experience of caring for migrant patients during their professional training. Dependency was established by first analyzing the types of discrimination reported in the literature, then investigating the behaviors and attitudes that represented exclusionary manifestations in the care of foreign patients. These findings were subsequently reviewed by the research team.

Results

The study included 106 students, comprising 35 men and 71 women from various health careers and universities (Table 1). The highest proportion of participants came from University 2, which offers all the health careers included in this study, followed by University 1 and University 3.

Table 1. Characterization of participants

	University 1		University 2		University 3		Total
Career	**Man**	**Woman**	**Man**	**Woman**	**Man**	**Woman**	
Medicine	4	5	7	1	NA	NA	17
Midwife	NA	NA	2	7	0	1	10
Nursing	2	5	2	6	0	1	16
Nutrition	1	7	0	8	0	6	22
Odontology	NA	NA	5	5	NA	NA	10
Pharmacy	NA	NA	5	5	NA	NA	10
Kinesiology	3	4	1	7	3	3	21
Total	**10**	**21**	**22**	**39**	**3**	**11**	**106**

NA: not applicable. The career is not taught in the university

From an overall approach, when asked directly whether they had observed discriminatory attitudes from health staff while caring for foreign patients, 64 of the 106 participants reported having witnessed discrimination, the remaining 42 indicated not having witnessed discrimination during health care; nevertheless, they declared that it occurred during the moment before or after the clinical care, that is, it was hidden. So, practically all the participants indicated having observed discriminatory conducts at some point during the health care process.

Another relevant result was that discrimination was observed as a transversal phenomenon, given that it took place in all care settings and professional profiles. Furthermore, Students noted that the older health staff (> 55 years of age) were those who displayed the most discriminatory behavior with their patients and users.

From the deductive analysis, six categories were established corresponding to types of discrimination existing in the scientific literature consulted: a) relationship of power, b) structural, c) racism, d) xenophobia, e) micro-discrimination, and f) aporophobia. Table 2 provides an operational description of each of these categories, the frequency of associated quotes, and the direct quote that supports it.

Table 2. Types of discrimination, operational definition, frequency, and direct quote

Type of discrimination	Operational definition	Quote freq.	Direct quote
Relationship of power	Situation in which the health staff feels superior to the foreign patient, whether due to nationality, knowledge, economic, political, educational situation, etc.	46	*"Simply because you are a foreigner: Venezuelan, Bolivian or any other nationality, whether from South America, regardless of your social class, you will be discriminated against in health care in Chile. You can have a thousand professional degrees, have an awesome job, but you will always be looked down upon. Whoever it is, it could be the doctor, nurse, etc., regardless of who it is, they will be looked down upon, so to speak. That is what I have noted lately, especially during this recent pandemic." MMi1(2)*
Structural	Situation in which the health system does not offer appropriate conditions to provide adequate care to foreign patients, for example: translator, forms, and signage in the patient's language, longer time in care, etc.	38	*"I mean, to start with, not having a translator, we're already starting off badly because, how are we going to care for them if they are Haitian and don't know Spanish? We will not know what they have, we won't know what they feel, the symptoms, the only thing we could know would be the vital signs, the physical exam. So, the biggest problem is the language and that we are not provided with the means to communicate with the patients." WNu2(1)*
Racism	Situation in which the health staff expresses attitudes or harmful behaviors product of the foreign patient's skin color	35	*"Even because of the skin color, for example, when they arrive with dermatological conditions. Because the patient has black skin, it is not possible to see, for example, erythema or any other lesion, so the patient is more complex. Then, generally, since they complain, they are made to wait or leave them for later. I don't know if they leave them at the end, but it's like the doctors are lazy or you are told to see them." MM1(1)*

Table 2. Types of discrimination, operational definition, frequency, and direct quote (Cont.)

Type of discrimination	Operational definition	Quote freq.	Direct quote
Xenophobia	Situation in which the health staff expresses attitudes or harmful behaviors product of the foreign patient's nationality	26	*"Especially in situations where there is a collective rejection of the arrival of immigrants in general, but especially South Americans. I don't know why they are so badly received in Chile. And, likewise, in the hospital, you notice the difference with the different types of comments made, which is not like explicit discrimination, but rather more subtle." WMi6(2)*
Micro-discrimination	Situation in which the health staff, unconsciously, express attitudes of disapproval, undervaluation, condescension, or prejudice towards the foreign patient	21	*"Let's see, I don't think there is a negative intention, no. But the problem, I believe, we have, as Chileans, is that we normalize the mockery, which – in the end – are no joke (…) But that is now a problem we have as society in general, in every sense." MN4(1)*
Aporophobia	Situation in which the health staff expresses attitudes or harmful behaviors due to the foreign patient's poverty situation	13	*"And also, sometimes, I saw a given type of prejudice. It was like they saw people with a certain appearance and they would leave them aside. It's like the typical prejudices we have: 'No, this person who looks better dressed, let's give preference to this one'." WP10(2)*

Coding of the direct quotes was conducted in the following manner: First letter: participant's sex (man: M and woman: W), second letter: participant's career (medicine: M, nursing: N, midwife: Mi, pharmacy: P, kinesiology: K, odontology: O, and nutrition: Nu), number without parenthesis: number designated to the participant according to the career, number with parenthesis: number designated to the university.

Using the ATLAS.ti 24 program, comparison was made among the three universities, included in this study, with the types of discrimination reported. Figure 1 shows that students from Universities 1 and 2 witnessed all the types of discrimination mentioned in Table 2; unlike University 3, which only reported xenophobia, racism, micro-discrimination, and relationship of power. Students from University 1 reported more structural discrimination and relationship of power; University 2, relationship of power, racism, and structural discrimination; and University 3, xenophobia.

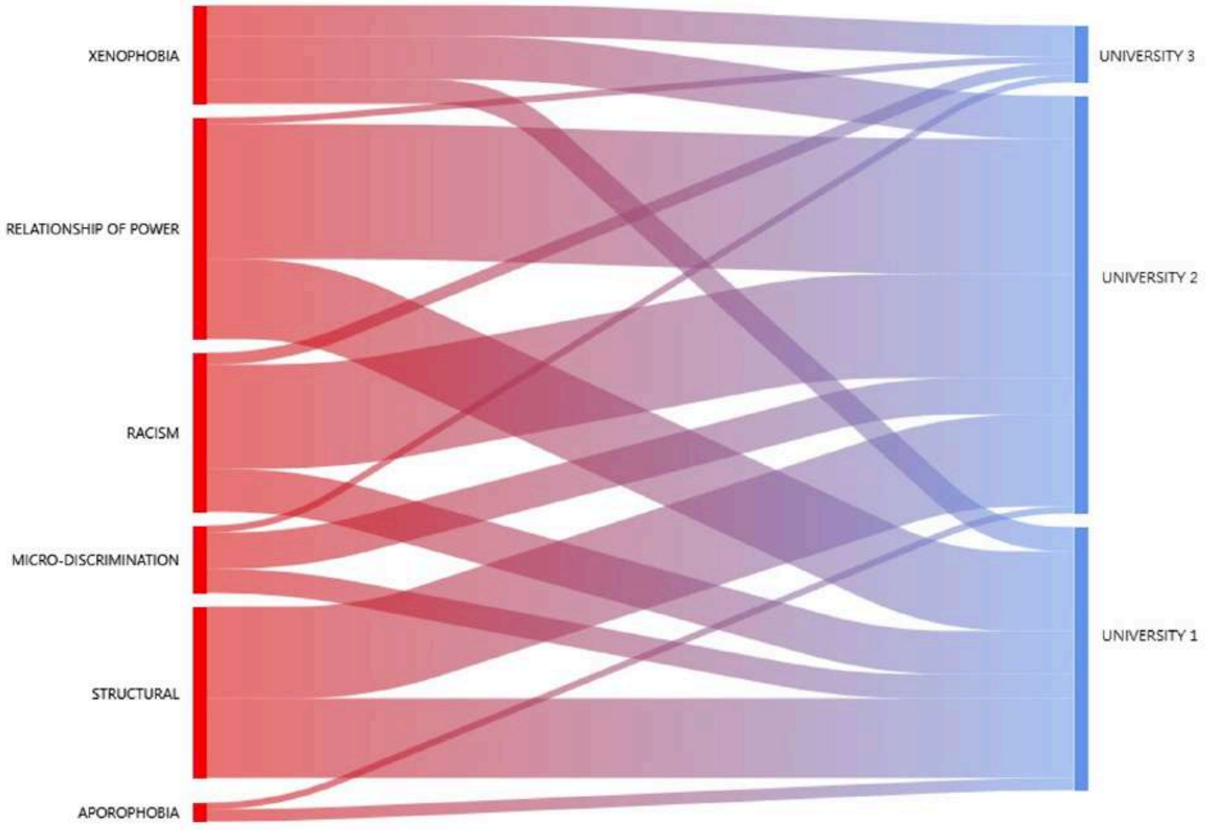


Figure 1. Types of discrimination according to university institution

From the inductive analysis of the text, a series of subcategories emerged that allowed identifying various behaviors, attitudes, or circumstances considered exclusion manifestations, which had other modes, nuances, and levels in the expression of discrimination, different from those reported by the literature. These were: a) apathy, b) prejudice/stereotyping, c) derogatory comments, d) evading, e) underestimating, f) normalizing discrimination, g) infantilizing, and h) scoffing. It can be noted how said displays occupy diverse ranges in the behavioral expression, the emotional charge, and the symbolic medium of aggression. The operational definition, frequency, and direct quote of the different manifestations of discrimination are detailed in Table 3.

Table 3. Manifestations of discrimination, operational definition, frequency, and direct quote

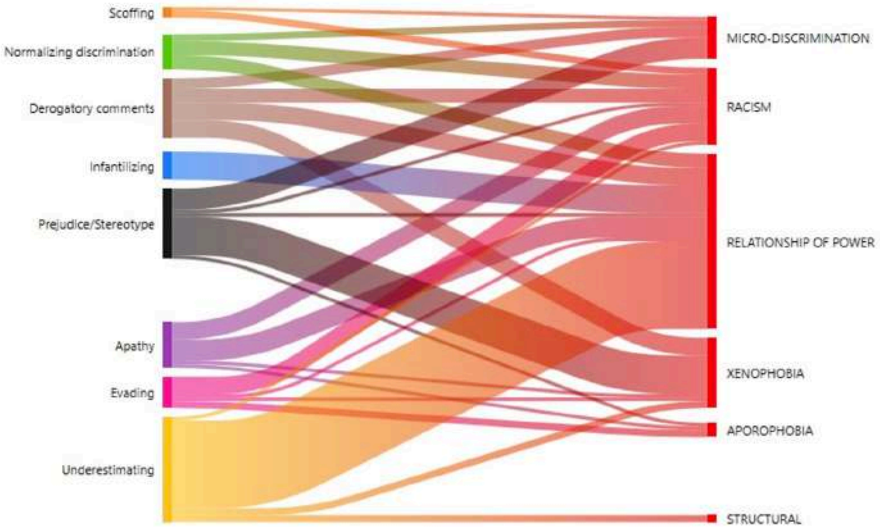
Manifestation of discrimination	Operational definition	Quote freq.	Direct quote
Apathy	Situation in which health care is conducted without considering the necessary adjustments to provide care that considers culture, language, customs, beliefs or other of foreign patients.	79	*[While caring for a Haitian patient] "She [the tutor] was teaching her about the nutrition for her child at 6 months. She had a pamphlet, but it was in Spanish. So, she was crossing out what the child should not eat. The mother did not understand much, but when she did not understand, she would look at her mom [grandmother] who spoke a bit more Spanish. Perhaps she should have provided more visual instructions, but she limited herself to reading the pamphlet in Spanish. Then there was a cultural difference, because the grandmother said: 'we don't eat that.' So, it was difficult. She was given the recommendations, but if they weren't used to Chilean food, most likely they wouldn't do it. But she focused on education with the pamphlet in Spanish and then gave it to them. I think it would have been better to have some more educational material or in their language, for better understanding." WNu6(1)*
Prejudice/ Stereotype	Situation in which the health staff has negative preconceptions about foreign patients	60	*"I remember the kinesiologist who was in charge of me, his comment was: 'I have nothing against immigrants, but it seems that in the end they are going to take our jobs from us, because they work for less money'. And I don't know, I think they can even be better professionals than us. I have also heard, several times, they say 'at the borders we have to be more careful because people come with diseases; they bring other microorganisms that don't exist here'. So, one has a very different vision, perhaps, than that of older people." WK6(1)*
Derogatory comments	Situation in which the health staff expresses derogatory opinions about foreign patients	53	*[Caring for Haitian patient] "When we finished the treatment, I remember one of the professors there saying: 'black mouth, big teeth, that's going to be a drama for the extraction later'. I was blank, it was strong, I couldn't get any words out, because everything coming out of this mouth could have consequences later, so I just kept quiet and looked down." WO8(2)*
Evading	Situation in which health care to foreign patients is postponed or delegated due to fatigue, listlessness, apathy, laziness, etc.	42	*"But no, it's not like they treat them badly, no. The truth is that I haven't seen any degree of discrimination or abuse, but yes, perhaps, there is a certain refusal to care for them, as if they are not as motivated. Perhaps because they encounter a greater communication barrier, it will be a bit more difficult for them to get care, that may be why (…) They say, for example: 'oh, a Haitian patient arrived, 'Oh, okay, but you take care of him.' It's like they pass the ball back and forth, to put it bluntly." WN7(2)*
Underestimating	Situation in which the health staff minimizes the symptoms or does not consider the foreign patient's belief in care	40	*"I heard, as a hallway comment, that Venezuelans were whinier, as were Haitians, but with an annoying tone. And during labor and post-partum, comments were made in more derogatory manner, especially with Haitian women, as if they should not be taken into account when complaining because they were exaggerating their pain. So, it seemed to bother them [the health staff] that they complained so much." WMi1(3)*

Table 3. Manifestations of discrimination, operational definition, frequency, and direct quote (Cont.)

Manifestation of discrimination	Operational definition	Quote freq.	Direct quote
Normalizing discrimination	Situation in which the health staff has normalized derogatory treatment towards foreign patients. Generally using diminutives to mitigate them	29	*"I think that the thing about the 'chinito' and the 'negrito' will never be ousted from Chilean idiosyncrasy. Personally, it irks me because it's as if we were going around saying about Chilean patients, the ugly patient, the lame one, the short one, etc. So, we have a name for a reason, right? Or, finally, don't say 'the little black one, say 'the patient in bed 15/2' and that's it, like any other patient." WNu3(3)*
Infantilizing	Situation in which the health staff disciplines foreign patients for behaviors they consider inappropriate (as a father/mother would do with a child)	22	*[Haitian patient after the ward] "So I asked [the patient] if she had wanted to urinate or maybe if she had wet the bed and she said: 'it seems so'. So, I notified the nursing aide to go help change the bedsheets. And she began to taunt her, she started to question she did that, that it wasn't right, that it was for dirty people and a whole bunch of things that weren't right. I found it very horrible, honestly." WMi4(2)*
Scoffing	Situation in which the health staff make derogatory jokes to foreign patients.	19	*"What I have seen are a lot of jokes (scoffing), especially among older doctors. For example, to Haitian patients, they say: 'Hey! Sell me a Super 8' or the typical phrase '2 for 300 or 5 for 500', as if alluding to the fact that Super 8 is sold(*). But, generally, it's the older doctors and who do have these behaviors at every level, that is, with Peruvians, Bolivians, even with Chileans, with impoverished people in general." MM1(1)* *(*)In Chile, working conditions for irregular migrants are complex, so they opt for selling sweets on street corners to have daily sustenance, one of them is the so-called Super 8 (wafer cookie covered in chocolate).*

Coding of the direct quotes was conducted in the following manner: First letter: participant's sex (man: M and woman: W), second letter: participant's career (medicine: M, nursing: N, midwife: M, pharmacy: P, kinesiology: K, odontology: O, and nutrition: Nu), number without parenthesis: number assigned to the participant according to the career, number with parenthesis: number assigned to the university.

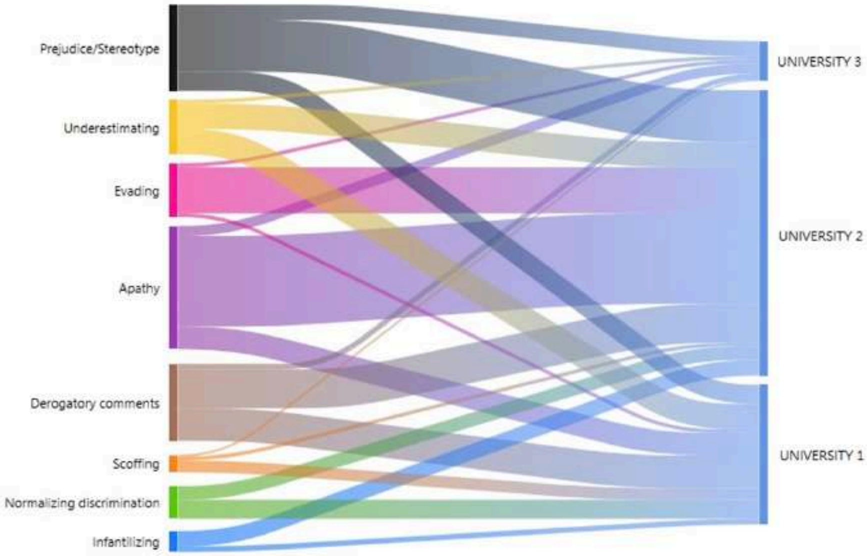
The study proceeded to relate the types of discrimination with the manifestations discovered in this research. The Sankey diagram permitted visualizing that the highest density of codes was for the discrimination relationship of power, which is connected with all the manifestations described in Table 3; except for scoffing. It is followed by racism that mainly has manifestations of evading, apathy, derogatory comments, normalizing discrimination, scoffing, prejudice/stereotyping, and underestimating; and xenophobia with prejudice/stereotyping, derogatory comments, underestimating, evading, and apathy. (Figure 2).



1.

Figure 2. Co-occurrence analysis between type of discrimination with manifestations observed by students

Similarly, a comparison was made of the students from the three universities regarding the different manifestations. It was highlighted that students from Universities 1 and 2 observed all the forms of manifestations described in Table 3, unlike University 3, which did not report witnessing attitudes of normalizing discrimination and infantilizing. In turn, students from University 1 witnessed more derogatory comments and apathy; University 2, apathy and evading; and University 3, prejudice/stereotyping and apathy (Figure 3).



2.

3. Figure 3. Manifestations of discrimination by University Institution

The analysis by career permits noting that students observed different manifestations of discrimination. Nursing saw more derogatory comments; medicine, apathy, derogatory comments, and underestimating; kinesiology, prejudice/stereotyping; midwife and nutrition, apathy and prejudice/stereotyping; pharmacy, apathy and evading; and odontology, derogatory comments, apathy, evading, and underestimating. Furthermore, it is important to clarify that in the medicine and kinesiology courses, eight manifestations were observed; in nursing, midwife and nutrition, seven were observed, and in pharmacy and odontology, six (Figure 4).

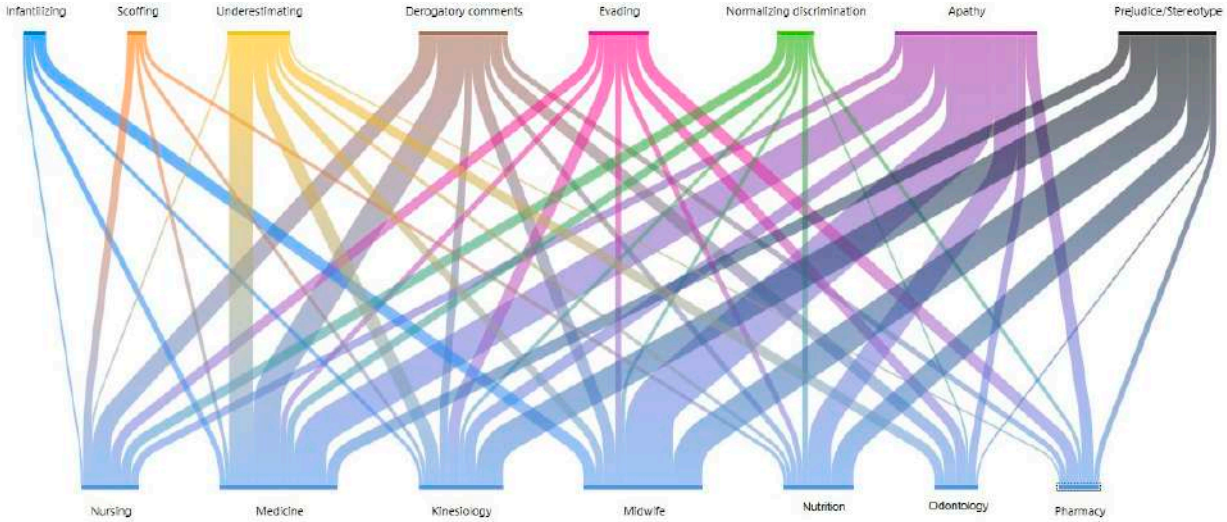


Figure 4. Manifestations of discrimination by career

Finally, different types of discrimination were related with diverse discrimination displays in health care (Figure 5). The Sankey diagram permits visualizing that the types of discrimination and their manifestations operated in hidden manner against the foreign population. Moreover, xenophobia, the relationship of power, and racism are linked with all the forms of manifestation that Health Sciences students indicate having witnessed when care was provided to foreign patients.

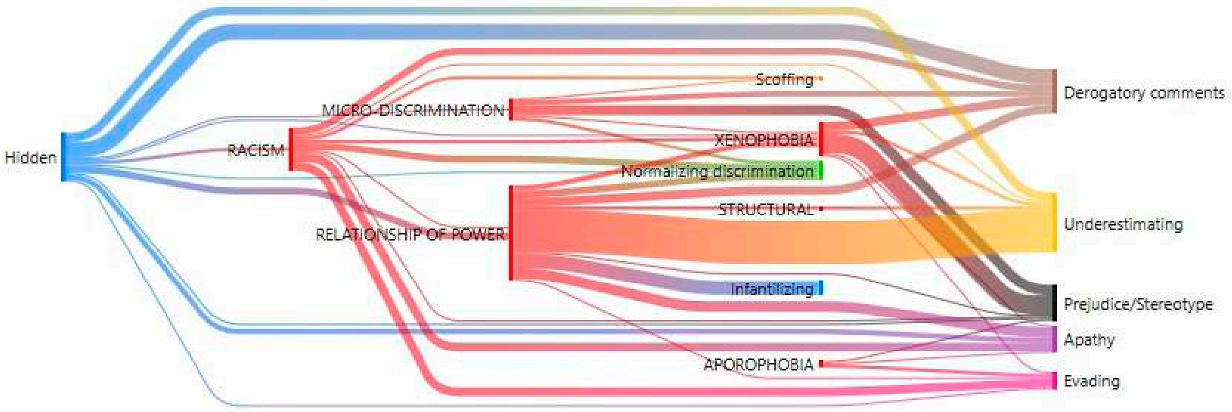


Figure 5. Relationship among types of discrimination with the different manifestations

Discussion

The diverse clinical experiences the participants had during their professional training allowed their being witnesses to different types of discrimination in health care to foreign population reported in the literature. Among the typology used, the most recognized in the three universities studied was the relationship of power. This agrees with international studies,(2,3,19) as well as with multiple investigations conducted in Chile, where a culture has been inherited that penalizes foreigners, especially South Americans, who are seen as inferior and unworthy of belonging to the country.(6) This research identified other conducts, attitudes, or circumstances valued as exclusion manifestations, which contributed certain nuances and degrees in discrimination. These were: a) apathy, b) prejudice/stereotyping, c) derogatory comments, d) evading, e) underestimating f) normalizing discrimination, g) infantilizing, and h) scoffing, which result in a relevant finding to understand how discrimination operates in the health environment and the subtleties it adopts.

In the co-occurrence analysis (Figure 2), it was interesting to note that the relationship of power was strongly linked to underestimating. This occurred, frequently, with foreigners with particular phenotypic characteristics, like darker skin color and unfavorable economic situation, which generate rejection by the Chilean population. This is also verified in international research, which report racial discrimination linked with the foreign patient's socioeconomic condition.(16,20,21) The manifestations most frequently reported by the different careers, notwithstanding the university, were apathy, prejudice/stereotyping, derogatory comments, underestimating, and evading. Among them, apathy and evading were highlighted as characteristic of health care. Both denote lack of interest and lack of willingness to carry out health care on the part of the responsible staff who delegate this task to others, like the students or other more sensitive staff who take on this care. Therefore, it could be said that discrimination against foreign patients has a secondary victim, which are those people in a more-vulnerable hierarchical position and, hence, they must assume tasks and responsibilities that do not correspond to them. Thus, one could speak of direct and indirect victims of the discriminatory practices applied by health professionals in caring for foreign patients.

The differences in the types of discrimination reported among the distinct universities could be due to the varying clinical fields and the territorial zones in which they are located. Nevertheless, it may have been because there were less participants from University 3, so there could be a lack of representativeness in the reports. Likewise, manifestations of normalization and infantilization were also not reported by this last group; in comparison to Universities 1 and 2 which witnessed all the forms of manifestation included in this study.

It is important to note how the relationship of power, followed by racism, xenophobia, and aporophobia are closely linked with apathy and evading. These exclusion manifestations were justified and normalized by a certain group of students due to the high workload faced by health staff; however, they are indirectly linked to structural discrimination through a display of contempt. This could indicate that, although structural barriers exist that the health system still does not manage, In certain health staff, there are underlying discriminatory components resulting from personal ideological conceptions that permeate the clinical environment, as indicated by other research.(22,23)

The types of discrimination and exclusion manifestations, seemingly, occurred unconsciously and thoughtlessly on the part of the professionals who engaged in such, given that they did not hide said behaviors from their students; however, these turn out evident for the participants from the different careers and universities included in this study. This constitutes a negative model in the teaching/learning process during health care to foreign patients, which could be a powerful reason why Intercultural Competence has not yet achieved the desired results in the professional practice of the health area. Diverse research reports discrimination against foreign population during clinical care, in which students in training are present, so it is admissible to postulate the idea that there could be a negative vicarious learning towards the care of foreign patients.(11,13,21,24) Thereby, these results guide the way to approach the professional training of future Health Sciences students, with emphasis on coexistence, comprehension, respect, and development of otherness; unlike that observed until now, where the contents in Intercultural Competence focus on bio-epidemiological aspects and public health in the curriculum.(15,25) Nonetheless, a training process is indispensable designed with adequate pertinence, efficacy, effectiveness, coherence, and acceptance of others,(26) in addition to promoting critical reflection.(17)

Consequently, the training process must compromise, explicitly, the development of self-awareness to inquire on our characteristic prejudices and stereotypes that could influence the professional/patient relationship, the cultural identity to be aware of our patterns, beliefs, and customs influencing upon our decisions and behaviors; self-reflection to analyze the different experiences lived with patients to better manage feelings, attitudes, and knowledge; the critical capacity to deconstruct prevailing ways of thinking in favor of new more-inclusive perspectives; and learning to manage uncertainty to learn to face the new challenges that global society imposes with integrity, flexibility, and relevance. Likewise, the system, as a whole, must provide entities or organizations where discriminatory events can be reported, confidentially, but also offer information, guidance, training, and conflict mediation services, as other research has suggested.(20,27) In this sense, Nursing professionals play a key role in ensuring discrimination-free care management, which permits complying with the standards of inclusion, equity, and cultural pertinence, which the WHO and the PAHO have indicated.

The greatest strength of this research is that it permits making visible the different exclusion manifestations that take place in the care process of foreign patients. Apathy and evading are even proposed as new forms of discrimination that occur in health care against the foreign population; unlike other types of manifestations that may be seen in any other setting of society. Therefore, the dissemination of these results is essential, both in the academic and clinical settings, because it may awareness for behavioral change and avoid their continued normalization and perpetuation, unconsciously, in the health staff.

One of the limitations of this research is the low number of applications received from University 3, from northern Chile. Despite multiple e-mails, phone calls, and diverse invitations made by the institution and its academics, during 10 months, nobody else was registered to conduct the interview. Nevertheless, The results obtained were quite similar because they had also witnessed discriminatory practices against the foreign population.

Future lines of research should be aimed at observational studies, which can account for more manifestations, which include interpretation of non-verbal language and proxemics, besides the characteristics of health professionals who have discriminatory practices, for greater comprehension of the phenomenon and intervene in a precise manner to benefit care with equity, inclusion and quality for the foreign population.

Conclusion. Health Sciences students who participated in this research witnessed different types of discrimination against the foreign population in health care. However, these discriminations did not always occur explicitly, but were hidden and/or adopted subtle displays, highlighting among them apathy and evading as characteristics of the health environment. It is cause for concern that certain participants normalize these attitudes due to the overload of the health system, which could indicate their perpetuating these practices in their future professional practice. Thereby, the training process of Health Sciences students must ensure the development of self-awareness as a foundation for getting rid of biases, prejudices, and stereotypes against the foreign population that are the basis of discrimination, in addition to self-reflection and critical capacity to understand how life experiences, beliefs, habits, patterns of coexistence and culture can influence the health decisions of foreign patients. Likewise, the health system must provide mediation units where students and foreign patients can go in case of needing help or guidance regarding any discrimination taking place during the care process.

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Depressive symptoms and frailty, effects of social distancing and isolation in older adults

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Original Article

Depressive symptoms and frailty, effects of social distancing and isolation in older adults

Abstract

Objective. To analyze the effects of social distancing and isolation during the Covid-19 pandemic on depressive symptoms and frailty in older adults in Primary Health Care. **Methods.** Prospective cohort study, using the following data collection instruments: Center for Epidemiological Studies depression scale, adherence to social distancing and isolation, and markers of the physical frailty phenotype. Descriptive statistical analysis, association and proportional hazards regression were performed. **Results.** 51.8% of the older adults progressed to pre-frailty, 14.1% had depressive symptoms, and a low degree of adherence to social distancing and isolation (69.4%). There was no association between distancing and isolation and depressive symptoms (*p*=0.748) and physical frailty (*p*=0.5). Single, separated, divorced or widowed people have 62% (HR=0.38; 95%CI 0.15-

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Conflicts of interest: None
Received: August 1st, 2024.
Approved: February 14th, 2025.

How to cite this article: Lenardt MH, Falcão AS, Cechinel C, Rodrigues JAM, Betiolli SE. Depressive symptoms and frailty, effects of social distancing and isolation in older adults. Investigación y Educación e Enfermería. 2025; 43(1):e10.

DOI: https://doi.org/10.17533/udea.iee.v43n1e10

0.96) less risk of being classified as frail and 57% (HR=0.43; 95%CI 0.21- 0.9) less chance of presenting depressive symptoms compared to married people. **Conclusion:** the low degree of adherence to social distancing and isolation showed no association with depressive symptoms and physical frailty. Sociodemographic factors highlighted risks of frailty and depressive symptoms that require attention and an individualized gerontological care plan.

Descriptors: coronavirus infections; social isolation; frail elderly; depression; primary health care.

Efectos del distanciamiento y del aislamiento social en los síntomas depresivos y fragilidad, en personas mayores

Resumen

Objetivo. Analizar los efectos del distanciamiento social y del aislamiento social durante la pandemia de Covid-19 sobre los síntomas depresivos y la fragilidad en personas mayores en Atención Primaria de Salud. **Métodos.** Estudio de cohorte prospectivo, en el que se utilizaron como instrumentos de recolección de datos: la escala de depresión del Center for Epidemiological Studies (CES-D), la escala de adherencia al distanciamiento y aislamiento social, y marcadores del fenotipo de fragilidad física. Se realizaron análisis estadísticos descriptivos, asociación y regresión de riesgos proporcionales. **Resultados.** 51.8% de las personas mayores evolucionaron a prefragilidad y 14.1% para síntomas depresivos, con bajo grado de adherencia al distanciamiento y aislamiento social (69.4%). No hubo asociación entre distanciamiento y aislamiento social y síntomas depresivos (p=0.748) y fragilidad física (p=0.5). Las personas solteras, separadas, divorciadas o viudas tienen un riesgo 62% (HR=0.38; IC95% 0.15-0.96) menor de ser clasificadas como frágiles y 57% (HR=0.43; IC95% 0.21-0.9) menor de presentar síntomas depresivos en comparación con las personas casadas. **Conclusión.** El bajo grado de adherencia al distanciamiento y aislamiento social no mostró asociación con síntomas depresivos y fragilidad física. Los factores sociodemográficos que se relacionaron con riesgos de fragilidad y síntomas depresivos requieren atención y un plan de cuidado gerontológico individualizado.

Descriptores: infecciones por coronavirus; aislamiento social; persona mayor frágil; depresión; atención primaria de salud.

Efeitos do distanciamento e isolamento social nos sintomas depressivos e fragilidade em pessoas idosas

Resumo

Objetivo. Analisar os efeitos do distanciamento e isolamento social na pandemia Covid-19 nos sintomas depressivos e na fragilidade em pessoas idosas da Atenção Primária à Saúde. **Métodos.** Estudo de coorte prospectivo, mediante os instrumentos de coleta de dados: escala de depressão Center for Epidemiological Studies (CES-D), adesão ao distanciamento e isolamento social e marcadores do fenótipo da fragilidade física. Foram realizadas análises estatísticas descritivas, associação e regressão de riscos proporcionais. **Resultados.** 51.8% das pessoas idosas evoluíram para pré-fragilidade e 14.1% para sintomas depressivos, e predominou baixo grau de adesão ao distanciamento e isolamento social (69.4%). Não houve associação entre distanciamento e isolamento social e os sintomas depressivos (p=0.748) e fragilidade física (p=0.5). Solteiros, separados, divorciados ou viúvos têm 62% (HR=0.38; IC95% 0.15-0.96) menos risco de serem classificados como frágeis e 57% (HR=0.43; IC95% 0.21-0.9) menos chance de apresentarem sintomas depressivos quando comparados aos casados. **Conclusão.** O baixo grau de adesão ao distanciamento e isolamento não mostrou associação com sintomas depressivos e fragilidade física. Fatores sociodemográficos apontaram riscos de fragilidade e sintomas depressivos que necessitam atenção e plano de cuidado gerontológicos individualizados.

Descritores: infecções por coronavírus; isolamento social; idoso fragilizado; depressão; atenção primária à saúde.

Introduction

Preventive measures such as social distancing and isolation, respiratory etiquette and hand hygiene were encouraged as a way to contain the spread of Covid-19.(1) Social distancing stands out among the measures adopted; it consists of "a conscious effort to reduce interactions between people in a larger community, in which individuals may be infected although not yet identified and therefore, not yet isolated". Social isolation, in turn, is the "measure that refers to the separation of people infected with contagious diseases from uninfected people".(2) Both social isolation and social distancing were analyzed as preventive actions during the Covid-19 pandemic, a phenomenon that went beyond issues related to health measures, with biopsychosocial manifestations. Social isolation is a measure in which people are advised not to leave their homes in order to prevent the spread of the virus,(3) while social distancing is a preventive measure in which people maintain a minimum distance between one another and avoid crowds.(4)

Although necessary, these restrictive measures have significant consequences on the lives of older adults. Restricting social and family interactions contributes to the risk of loneliness and predicts cognitive decline and decreased overall functionality.(5) A longitudinal study conducted with data from the English Longitudinal Study of Aging (ELSA) assessed trends in frailty status associated with loneliness and social isolation over 14 years in a sample of 9,171 English people (mean age of 66.3 years), and presenting a high level of social isolation was associated with a higher frailty index score ($p<0{,}0001$).(6)

The relationship between social distancing and social isolation and the development of physical frailty is not fully understood. A study that evaluated the effects of social distancing and isolation on the frailty condition and physical activities of 168 community-dwelling older adults found no association between the variables.(7) Physical frailty can be defined as "a clinical condition in which there is an increased vulnerability of an individual to the development of dependency and/or increased mortality when exposed to a stressor".(8) This condition is often assessed according to the phenotype proposed from the Cardiovascular Health Study (CHS), which consists of five biological markers: unintentional weight loss, self-reported fatigue/exhaustion, decreased handgrip strength, decreased physical activity, and reduced gait speed. The presence of three or more markers is classified as frail, one or two as pre-frail, and no marker as non-frail.(9) Although widely recognized, there is no current established definition for depressive symptoms. They are often distinguished by depressive symptoms manifesting subtly with dysphoria and somatic symptoms, and are often associated with features of depression.(10)

A cross-sectional study conducted in Singapore with a sample of 721 older adults (≥60 years) investigated the association between the level of frailty and depressive symptoms. An increase in depressive symptom scores ($p<0.001$) was identified with the worsening of frailty.(11) Social disconnection and decreased family interaction affect older adults, since most are not accustomed to digital technologies, which interferes with their social engagement. These circumstances together with social isolation may trigger the emergence/worsening of depressive symptoms.(12)

Studies on the possible consequences generated by social restrictions can contribute to society and especially to the population of older adults and encourage the adoption of alternative measures that help prevent and/or mitigate these consequences. Given the above, the aim of the present study was to analyze the effects of social distancing and social isolation during the Covid-19 pandemic on the frailty and depressive symptoms of older adults in Primary Health Care.

Methods

This is a prospective cohort study developed from the formation of a cohort of participants who were identified without the variables of interest (depressive symptoms and physical frailty) in the pre-pandemic period. Subsequently, they were allocated into two cohorts according to the degree of exposure to social distancing and social isolation during the Covid-19 pandemic. The cohorts were monitored during the pandemic period and observed for the occurrence or not of the variables of interest. The study location was defined as a Basic Health Unit (UBS) in the southern region of Brazil (first wave of collection) and the households in the area covered by the same UBS (second wave of collection).

Population, selection criteria and collection period and sample

Non-frail participants without depressive symptoms (n=147) were selected from the sample of 389 older adults to compose the first wave of the study, collected in 2019. The study cohorts were organized during the second wave of data collection, according to the degree of social distancing and social isolation (exposure) and observed for the occurrence of the variables of interest, depressive symptoms and/or physical frailty (outcome).

The target population consisted of older adults aged 60 years or older who were permanently registered at the UBS, had cognitive capacity to answer the questions or were accompanied by a caregiver, were not frail and free of the "depressive symptoms" marker in the first wave and had participated in both waves of data collection. The Mini-Mental State Examination (MMSE)(13) was used for cognitive screening, and the level of education was considered for cutoff points.(14)

The exclusion criteria were: having a medical diagnosis of dementia, schizophrenia, Parkinson's, being a wheelchair user or having had an amputation of the lower or upper limbs. The criteria for discontinuation were: death; moving address outside the coverage area of the UBS; being hospitalized during the data collection period; not being able to locate the registered address; and refusing to participate in the second wave. Of the 147 participants in the first wave of assessment, six died, 10 changed their address (outside the area covered by the UBS), one was hospitalized, 15 were deregistered from the UBS, 29 refused to participate, and one was not located at home. Thus, the sample for the second wave of evaluation consisted of 85 older adults.

The second wave of evaluation was during the pandemic period, between July and August 2021. The diagnosis of Covid-19, time of isolation in case of suspected Covid-19, and the Scale of Degree of Adherence to Social Distancing and Social Isolation were the variables collected. The total time between the first and second waves of data of collection was two years and seven months.

Study variables and data collection

The dependent variables were the presence of depressive symptoms and the condition of physical frailty. The independent variables were sociodemographic, clinical, and degree of social isolation and social distancing. The structured questionnaire included sociodemographic identification questions (sex, age, race, marital status, education, and financial situation) and clinical questions (health status, use of medications, polypharmacy, hospitalizations, and report of falls in the previous year).

To identify the condition of physical frailty, the markers of the frailty phenotype by Fried et al.(2001) were assessed: slow walking speed, poor handgrip strength, unintentional weight loss, decreased level of physical activity, and self-reported fatigue/exhaustion.(9) Depressive symptoms were evaluated by applying the Center for Epidemiological Studies Depression Scale (CES-D). This screening instrument has 20 items that address mood, somatic symptoms, interactions with others, and motor functioning. Responses are determined by the Likert scale: never or rarely (0), a few times (1), almost always (2), always (3). The score ranges from 0 to 60 points. A score >11 indicates the presence of depressive symptoms.(15) To assess the degree of adherence to social distancing and social isolation, a Likert-type scale was developed by the authors of this study. After explaining the concepts of social distancing and social isolation, study participants were asked to recall the period from March to December 2020, the period before the application of vaccines for immunization against Covid-19. The following questions were used: Did you practice social distancing? Did you practice social isolation? Did you practice this distancing and/or social isolation without leaving home? For each question, the answer is categorized as: (1) never (<10 days), (2) rarely (10-14 days), (3) sometimes (15-30 days), (4) almost always (31-90 days), (5) always (>90 days). Scores four (4) and five (5) are considered to be a high degree of adherence, and the others represent a low degree of adherence. Older adults were categorized into two cohorts based on the degree of adherence to social distancing and social isolation. Figure 1 shows the flowchart of the study data collection steps.

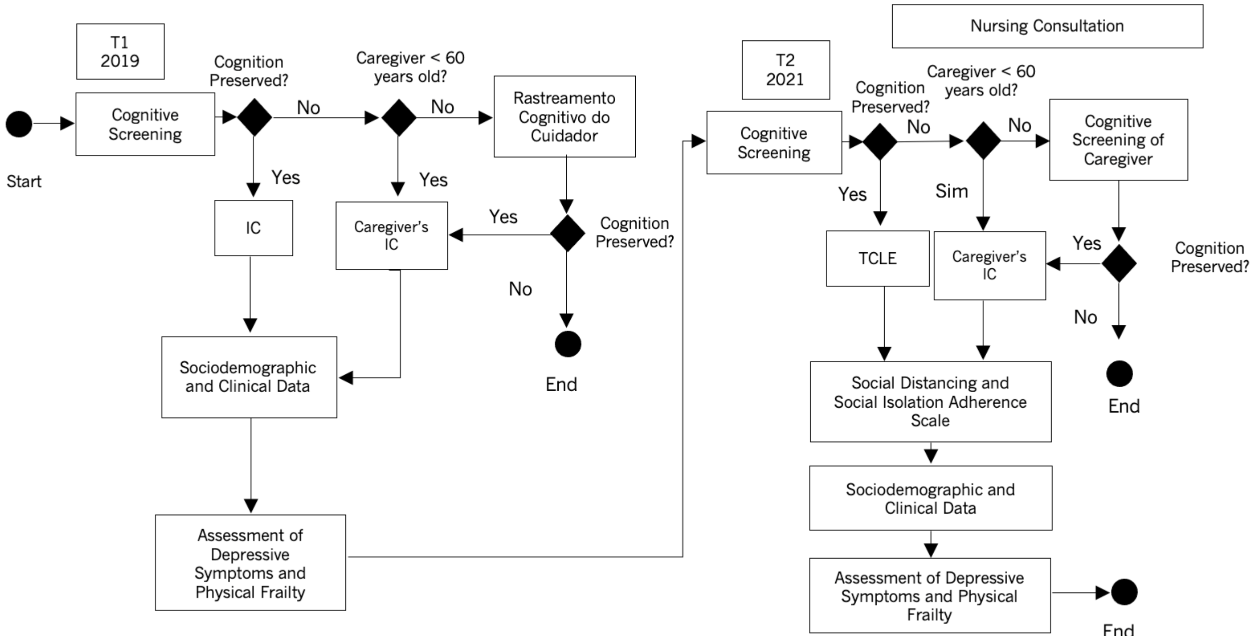

Figure 1. Flowchart of the study data collection steps.

Data analysis and processing

Descriptive statistical analysis techniques were used to assess changes in terms of sociodemographic and clinical characteristics, condition and markers of frailty, depressive symptoms, and degree of adherence to social distancing and social isolation. Individuals who did not provide complete information, present in the first and second waves, were excluded. The cohorts of the first and second waves were compared with the group of losses for the treatment of losses to follow-up and assessment of any statistical difference between proportions. Then, the chi-square test for $n \geq 5$ and the Fisher's exact test for $n < 5$ were applied to test the associations between depressive symptoms and frailty with the degree of adherence to social distancing and social isolation.

The time variable was constructed by subtracting the date of collection of the information of the second wave from the date of the first wave. Semi-parametric Cox proportional hazards models were conducted to obtain adjusted estimates of hazard ratios. Sociodemographic variables not indicated by the adjustment model due to sample heterogeneity were also included in the multivariate analyzes. Crude estimates of hazard ratios (HR) were presented with their respective 95% confidence interval (95% CI), regarding the association between the covariates of interest and the individual presenting some level of frailty and presence of depressive symptoms. The Wald test was performed to calculate the p-value for each coefficient of the covariates of the survival models. The Schoenfeld residual analysis statistical test was used to assess the assumption of proportional failure rates in the final Cox model. All hypothesis tests were performed with 5% significance.

Ethical aspects

The ethical principles of voluntary and consented participation were observed through the signing of the Informed Consent form (IC) in accordance with recommendations contained in Resolution No. 466 of the National Health Council of 12 December, 2012, prior to the start of data collection. Participants were given information about the possibility of refusing to answer any questions, or even ending their participation by requesting a copy of the signed IC without this interfering in any way with their care at the Basic Health Unit. The study project was approved by the Research Ethics Committee of the Health Sciences Sector of the Universidade Federal do Paraná under opinion 4.766.196 of June 2021, and by the Ethics Committee of the Municipal Health Department under opinion 4.856.197 of July 2021.

Results

Table 1 shows that 85 older adults completed the average follow-up time of 763 ± 88 days (620-942). There was a predominance of females (60%), age range 70-79 years (55.3%), average education level (4-8 incomplete years of study) (41.2%), self-declared white skin color (71.8%), married (52.9%) and an income of up to two minimum wages (56.5%). The participants who did not remain in the follow-up were those in the youngest age range (60-69 years; 64.5%) and female (59.7%).

At the end of the follow-up, 97.6% of older adults reported health problems with a predominance of cardiovascular diseases (70.6%). Multimorbidities reached 80% of the sample with even higher percentages of medication use (92.9%). The variable polypharmacy was observed in 43.5% of the people in the second wave.

Table 1. Distribution of sociodemographic characteristics (*n*=147)

Variable	First wave of data collection		Second wave of data collection		Loss to follow-up	
	(*n*=85)	% (95%CI*)	(*n*=85)	% (95%CI*)	(*n*=62)	% (95%CI*)
Sex						
Female	51	60 (49.4; 69.8)	51	60 (49.4; 69.8)	37	59.7 (47.3; 71.0)
Male	34	40 (30.2; 50.6)	34	40 (30.2; 50.6)	25	40.3 (29.0; 52.7)
Age group						
60 to 69 years	39	45.9 (35.7; 56.4)	31	36,.5 (27.0; 47.1)	40	64.5 (52.1; 75.3)
70 to 79 years	42	49.4 (39.0; 59.8)	47	55.3 (44.7; 65.4)	18	29 (19.2; 41.3)
80 years or older	4	4.7 (1.8; 11.5)	7	8.2 (4.0; 16.0)	4	6.5 (2.5; 15.4)
Level of schooling						
Illiterate (<1 year)	4	4.7 (1.8; 11.5)	3	3.5 (1.2; 9.9)	3	4.8 (1.7; 13.3)
Low level (1-4 incomplete years)	24	28.2 (19.8; 38.6)	14	16.5 (10.1; 25.8)	16	25.8 (16.6; 37.9)
Medium level (4-8 incomplete years)	21	24.7 (16.8; 34.8)	35	41.2 (31.3; 51.8)	15	24.2 (15.2; 36.2)
High level (8 years or more)	36	42.4 (32.4; 53.0)	33	38.8 (29.2; 49.5)	28	45.2 (33.4; 57.5)
Skin color (self-declared)						
White	62	72.9 (62.7; 81.2)	61	71.8 (61.4; 80.2)	48	77.4 (65.6; 86.0)
Brown, black, yellow or indigenous	23	27.1 (18.8; 37.3)	24	28.2 (19.8; 38.6)	14	22.6 (14.0; 34.4)
Marital status						
Single	6	7.1 (3.3; 14.6)	5	5.9 (2.5; 13.0)	4	6.5 (2.5; 15.4)
Married	48	56.5 (45.9; 66.5)	45	52.9 (42.4; 63.2)	30	48.4 (36.4; 60.6)
Stable union	2	2.4 (0.6; 8.2)	4	4.7 (1.8; 11.5)	2	3.2 (0.9; 11.0)
Separated	8	9.4 (4.8; 17.5)	8	9.4 (4.8; 17.5)	5	8.1 (3.5; 17.5)
Divorced	6	7.1 (3.3; 14.6)	6	7.1(3.3; 14.6)	8	12.9 (6.7; 23.4)
Widowed	15	17.6 (11.0; 27.1)	17	20 (12.9; 29.7)	13	21 (12.7; 32.6)
Employment status						
Working	10	11.8 (6.5; 20.3)	6	7.1 (3.3; 14.6)	7	11.3 (5.6; 21.5)
Retired	55	64.7 (54.1; 74.0)	52	61.2 (50.5; 70.8)	34	54.8 (42.5; 66.6)
Retired + working	10	11.8 (6.5; 20.3)	18	21.2 (13.8; 31.0)	5	8.1 (3.5; 17.5)
Pensioner	4	4.7 (1.8; 11.5)	5	5.9 (2.5; 13.0)	8	12.9 (6.7; 23.4)
Retired + pensioner	1	1.2 (0.2; 6.4)	3	3.5 (1.2; 9.9)	1	1.6 (0.3; 8.6)
Unemployed	5	5.9 (2.5; 13.0)	1	1.2 (0.2; 6.4)	7	11.3 (5.6; 21.5)
Older adult income						
Up to 2 MW**	45	52.9 (42.4; 63.2)	48	56.5 (45.9; 66.5)	39	62.9 (50.5; 73.8)
From 2 to 4 MW**	25	29.4 (20.8; 39.8)	25	29.4 (20.8; 39.8)	14	22.6 (14.0; 34.4)
From 4 to 10 MW**	13	15.3 (9.2; 24.4)	9	10.6 (5.7; 18.9)	4	6.5 (2.5; 15.4)
> 10 MW**	0	0 (0.0; 4.3)	1	1.2 (0.2; 6.4)	1	1.6 (0.3; 8.6)
No income	2	2.4 (0.6; 8.2)	2	2.4 (0.6; 8.2)	4	6.5 (2.5; 15.4)

NOTE: *95%CI - 95% confidence interval; **MW - Brazilian minimum wage (R$1,518.00; Decree No. 12.342/2024)

Most older adults showed a low degree of adherence to social distancing and social isolation (69.4%). In the second wave, 14.1% developed depressive symptoms. Of the 85 non-frail individuals in the first wave, 51.8% evolved to pre-frailty, 2.3% to frailty, and 45.9% remained non-frail throughout the follow-up. Pre-frail and frail individuals showed a lower degree of adherence to social distancing and social isolation (n=30; 65.2%) than non-frail individuals (n=29; 74.4%). There was no association between the degree of adherence to social distancing and physical frailty (*p*=0.5).

Table 2. Association between the degree of adherence to social distancing and social isolation of the cohorts and the presence of depressive symptoms and physical frailty

Adherence to social distancing and social isolation	Physical frailty				*p*-value†
	Non-frail		Pre-frail or frail		
	(*n*=39)	% (95%CI*)	(*n*=46)	% (95%CI*)	
High	10	25.6 (14.6; 41.1)	16	34.8 (22.7; 49.2)	0.5
Low	29	74.4 (58.9; 85.4)	30	65.2 (50.8; 77.3)	
Adherence to social distancing and social isolation	**Depressive symptoms**				***p*-value†**
	Yes		**No**		
	(*n*=12)	**% (95%CI*)**	**(*n*=73)**	**% (95%CI*)**	
High	3	25 (8.9-53.2)	23	31.5 (22.0-42.9)	0.748
Low	9	75 (46.8-91.1)	50	68.5 (57.1-78.0)	

Note: *95%CI – 95% Confidence Interval; †Chi-square test, p-value <0.05

Regarding the diagnosis of Covid-19, the same occurred in 2.6% (95%CI 0.5-13.2) of the non-frail and in 8.7% (95%CI 3.4-20.3) of pre-frail and frail, *p*=0.369. Table 3 shows that single, separated, divorced or widowed individuals have a 62% (HR=0.38; 95%CI 0.15-0.96) lower risk of being classified as frail and 57% (HR=0.43; 95%CI 0.21-0.9) lower risk of presenting depressive symptoms compared to married individuals. Older adults who are working or pensioners have a 72% (HR=0.28; 95%CI 0. 12-0.69) lower risk of being classified as frail and 60% (HR=0.40; 95%CI 0.21-0.77) lower risk of presenting depressive symptoms compared to those who are not working.

Table 3. Proportional hazards models for the association of the presence of frailty and depressive symptoms with sociodemographic characteristics

	Physical frailty		Depressive symptoms	
Variables	Crude HR* (95%CI†)	Model Adjusted HR* (95%CI†)	Crude HR* (95%CI†)	Model Adjusted HR* (95%CI†)
Sex				
Male	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
Female	1.33 (0.64; 2.78)	2.55 (0.89; 7.36)	0.64 (0.4; 1.03)	1 (0.48; 2.11)
Level of Schooling				
Low	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
Medium	1.41 (0.55; 3.59)	1.78 (0.6; 5.29)	1.68 (0.86; 3.27)	1.32 (0.63; 2.76)
High	1.89 (0.78; 4.56)	2.25 (0.74; 6.85)	1.68 (0.87; 3.25)	1.44 (0.65; 3.17)
Age range				
60 to 69 years	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
70 years or older	0.72 (0.38; 1.36)	0.78 (0.33; 1.81)	0.87 (0.54; 1.4)	0.85 (0.44; 1.65)
Race/color				
White	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
Non-white	0.87 (0.39; 1.91)	0.93 (0.38; 2.29)	1.24 (0.72; 2.12)	1.67 (0.89; 3.16)
Marital status				
Married/Stable union	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
Single/Divorced/Widowed	0.75 (0.39; 1.43)	0.38 (0.15; 0.96)§	0.54 (0.33; 0.88)	0.43 (0.21; 0.9) §
Multimorbidity				
Yes	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
No	0.66 (0.29; 1.51)	1.27 (0.43; 3.78)	0.69 (0.37; 1.26)	1.14 (0.54; 2.41)
Employment status				
Not working	1. (Ref.)	1. (Ref.)	1. (Ref.)	1. (Ref.)
Working/Pensioner	0.52 (0.26; 1.03)	0.28 (0.12; 0.69)§	0.64 (0.39; 1.05)	0.40 (0.21; 0.77)§

Note: *HR - hazard ratio; †95%CI = 95% Confidence Interval; Wald test§ 0.01 ≤*p*-value < 0.05.

Discussion

When assessing the effects of social distancing and social isolation in the cohorts from the first to the second wave of data collection, more than half of the older adults (51.8%) evolved to pre-frailty, 2.3% to frailty, and 45.9% remained non-frail. The transition from frailty can occur in a short or long period of time; the magnitude of this period has not yet been established, since the pathophysiology of physical frailty is quite complex. The high percentage of pre-frailty in the population of older adults is observed in studies developed in different contexts, both internationally and nationally.(16-18) A retrospective cohort study analyzed data from the longitudinal Survey of Health, Ageing and Retirement in Europe (SHARE) carried out in 28 countries (age 65 years and older). At baseline, 8,133 were non-frail. Of this sample, 34.4% (*n*=2,798) developed pre-frailty and 3.0% ($n=247$) developed frailty within two years of baseline.(19)

When comparing the percentages of physical frailty with those observed in the studies, although the contexts in which the studies were conducted varied greatly, the pre-frailty condition predominated in most studies. In view of this, there is growing interest in interventions in pre-frailty, since this stage is sensitive to changes and can be clinically reversible,(20) which highlights the importance of its early identification and interventions to reverse it or prevent its progression. Low adherence to social distancing and social isolation was observed in approximately 75% of non-frail older adults, which is a higher percentage than that of non-frail with high adherence (25.6%, 14.6-41.1). Low adherence was also observed in pre-frail and frail subjects (65.2%). The restrictive measures adopted during the Covid-19 pandemic also contributed to the transition to levels of physical frailty, as more than 50% transitioned to pre-frailty and 2.3% to frailty. A prospective longitudinal study of 119 older adults from the Montreal community (Canada) (≥ 70 years) showed that home confinement was associated with increased physical frailty ($p \leq 0.038$).(20)

In the present study, 14.1% of the sample developed depressive symptoms. A similar result was observed in the analysis of the second wave of a cohort study with 7,609 Medicare beneficiaries in the United States of America, which showed that 15% of older adults presented depressive symptoms.(21) An even more expressive percentage was found in a systematic review with meta-analysis that aimed to assess the prevalence of depressive symptoms in mainland China. Eighty-one eligible studies were analyzed and a combined global prevalence of depressive symptoms of 20.0% (95% CI; 17.5-22.8) was identified.(22) Depression in older adults is worrying, as this is a disorder with declining energy and the potential to affect all aspects of life, in addition to aggravating and/or triggering other conditions, such as physical frailty.(23) Furthermore, in old age, as a rule, the person faces unwanted changes, losses and feelings of grief, which makes treatment more difficult and time-consuming.

The adoption of restrictive measures may have contributed to an increase in the percentages of depressive symptoms in older adults, even though a low incidence was observed in the present study in relation to incidence in the country. In a meta-analysis conducted in Minas Gerais (Brazil), a prevalence of 21.0% (95% CI; 18.0-25.0; I2=98.3%) of depressive symptoms was found in community-dwelling older adults with a variation of 7.10% to 39.6%, respectively, for a study conducted in the South and Northeast regions of the country. Thus, the South region, where the present study was conducted, had the lowest percentage.(10) Note that the sample of the present study is composed of older adults with a high level of education, retirees from the South region of Brazil, which is one with the best socioeconomic indicators. Therefore, the fact that this sample has more favorable sociodemographic conditions may influence higher rates of coping, resilience, and social support, resulting in lower rates of depression.

Age may also be a protective factor for mental health in the context of the pandemic, since retired older adults with a high level of education would not have to deal with changes in their work routine, fear of unemployment, financial insecurity and poverty, which are serious economic consequences that seriously affect the mental health of people working in the job market.(24) Regarding the degree of adherence to social distancing and social isolation in the present study, it was significantly low (69.4%), only 30.6% achieved a high degree of adherence to restrictive measures. The low degree of adherence to social distancing and social isolation by older adults has been observed in several studies, with great variability in percentages. This is justified because the definition of social isolation or social distancing varies between studies and different epidemic periods, making comparisons difficult, both between countries and between groups or individuals within the same country.(25)

National studies have identified a low degree of adherence to social distancing and social isolation among older adults, particularly among participants in the second wave of the ELSI-Brazil from 70 municipalities located in the five major regions of the country, which examined the prevalence of social distancing in a sample of 6,149 subjects (mean age 63.4 years). Social distancing was defined as not having left home in the previous seven days. Only 32.8% of the study participants did not leave home during the period considered, 36.3% left home between one and two times, 15.2% between three and five times and 15.7% went out every day.(25) A cross-sectional study of 4,035 participants from the second wave of the ELSI-Brazil identified that 37.2% of them went out for essential activities, and living in the South Region increased the chance of older adults going out for essential activities (OR 1.77; 95% CI: 1.01-3.1), as the distancing measures were more flexible, since the incidence of Covid-19 was lower at the time of the interviews compared to other regions in the country.(26)

The need to work in order to contribute to the family income may be linked to the low adherence of older adults to restrictive measures. A study of 9,173 Brazilians investigated the adherence to social distancing. Retired older adults or those who were no longer working before the pandemic showed greater adherence to social distancing measures (OR 40.4%; 95%CI 34.8-46.3 and OR 41.7%; 95%CI 33.8-50.0), while approximately 10% of older adults who continued working from home still did not adhere to social distancing (95%CI 5.4-17.4). Of those who performed some essential activity during the pandemic, 44.2% (95%CI: 33.9-55.1) did not adhere to social distancing.(27) Of the 14.1% of older adults who developed depressive symptoms, 75% showed low adherence to social distancing and social isolation. This datum is corroborated by a study of 1,005 older adults (≥65 years) conducted in Germany with the aim to identify mental well-being during the restrictive measures of Covid-19. The findings did not indicate a worsening in mental well-being and showed similar or even lower numbers compared to studies prior to the pandemic.(28)

Although an association between depressive symptoms and social distancing and social isolation has not been found in the present investigation, the magnitude of the emotional consequences of social distancing during Covid-19 should be considered. A recent study showed that reduced social connectivity during the Covid-19 pandemic increased the risk of presenting symptoms of depression by 17.24 times (95% CI; 13.20-22.50).(29)

In a study of 477 older adults (mean age of 71.6 years), it was found that greater social isolation predicted greater depression ($p<0.001$).(30) For older adults confined to their homes, doing things alone is often unattainable due to limited physical and mental capacity, which can cause common symptoms of depression, such as decreased feelings of self-control and competence.(31) The initial characteristics of the sample, with non-frail older adults, may have led to the lack of association between social distancing and social isolation and depression.

In addition to exercising their care skills during the pandemic, nursing professionals must create bonds with the population of older adults in the community to establish a relationship of trust and thus maximize their service strategies. In this regard, nurses need to pay attention to effective, clear communication that is adapted to the reality experienced by the population.(32)

Single, separated, divorced or widowed older adults have a 62% (HR=0.38; 95%CI 0.15-0.96) lower risk of being classified as frail and a 57% (HR=0.43; 95%CI 0.21-0.9) lower risk of presenting depressive symptoms compared to married individuals. Converging data were observed in the China Health and Retirement Longitudinal Study (CHARLS) conducted with 14,351 older adults (≥ 60 years). The aim of the study was to investigate the incidence of frailty in the population of Chinese older adults living in the community and explore the risk factors and protective factors for frailty. It was observed that the marital status (single, divorced and widowed) (OR 0.43; 95% CI; 0.27-0.67) was a protective factor against physical frailty.(17)

Regarding the significant association between depressive symptoms and the marital status variable, married subjects or those in a stable union develop depressive symptoms more quickly and in a shorter observation time. These findings are related to different factors, among which the greater exposure to the risk of suffering depletion processes resulting from marital relationships. In view of this, the marital status may be related to the development of depressive symptoms in older adults. Health professionals should pay attention to older adults at risk of developing depressive symptoms, especially those who are married or in a stable union, and seek to offer social support to prevent this problem.

Older adults who work or are pensioners are at a 72% lower risk of being classified as frail and a 60% lower risk of presenting depressive symptoms compared to those who are not working. Older adults out of the job market, with reduced income and problems related to financial autonomy, experience a change in their role, from provider to financially dependent, which can favor the emergence of depressive symptoms.(33) These data are an alert to the need for a closer look at characteristics of the sociodemographic profile that are often neglected when it comes to health care of older adults.

The diagnosis of Covid-19, during the follow-up of the cohorts did not differ according to the frailty condition. These findings are corroborated by data from a prospective cohort with 4,510 participants. The condition of pre-frailty (OR 0.9; 95% CI; 0.8-1.1) and frailty (OR 0.9; 95% CI; 0.7-1.2) was not associated with Covid-19 diagnosis.(34) A divergent finding was found in a study conducted in England with 383,845 participants (aged between 37 and 73 years) from the UK Biobank. A higher risk of Covid-19 was observed in pre-frail individuals (RR 1.47; 95% CI; 1.26-1.71) and frail individuals (RR 2.66; 95% CI; 2.04-3.47).(35)

The limitations of the study are: sample losses, lack of standardization of the different instruments and cutoff points used in the studies to evaluate the main variables, making comparisons difficult; the use of a scale without testing and validation to assess the degree of adherence to social distancing and social isolation, in addition to memory bias in relation to the time evaluated; the self-report questions of some instruments may have been impaired by memory failures, thereby contributing to less accurate information.

The importance of health professionals, especially nurses, in continuously monitoring the physical frailty of older adults and establishing an action plan aimed at reversing the status of frail or pre-frail individuals to a non-frail condition is highlighted. To this end, it is essential to encourage the adoption of practices that are already established in the literature, which are pillars for preventing the progression of physical frailty, including: appropriate caloric and protein support, vitamin D supplementation, reduction of polypharmacy, and the practice of resistance and aerobic physical exercises. Actions that involve encouraging the continuous practice of physical activities and exercises are essential.

Nursing professionals play a major role in health services, especially in primary health care. As such, they are the main characters, creators of guiding strategies for the implementation and dissemination of measures aimed at preventing depressive symptoms and physical frailty in older adults.

The conclusion of this study is that more than half of the sample evolved to a pre-frail condition. The low incidence of depressive symptoms was attributed to the resilience commonly acquired by older adults over the course of their lives. Most older adults showed a low degree of adherence to social distancing and social isolation measures during the Covid-19 pandemic. Social distancing and social isolation did not generate depressive symptoms and did not change the condition of physical frailty in older adults in primary health care. Single, separated, divorced or widowed subjects had a lower risk of developing depressive symptoms and being classified as pre-frail and frail compared to married subjects. Older adults who are working or are pensioners are at a lower risk of developing depressive symptoms and being classified as pre-frail and frail.

This study supports strategies for gerontological practice by directing the monitoring of older adults at risk in order to prevent the transition to a condition of frailty and depressive symptoms in primary health care. Among the strategies, it is essential to encourage the return to the practice of activities that were interrupted during the pandemic, and monitor older adults with a high family income, who do not work and are married or in a stable union for the risk of depressive symptoms and physical frailty.

Financial support: There was no financial support for this project.

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Care provided by humanoid robots: a scoping review

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Care provided by humanoid robots: a scoping review

Abstract

Objective. To identify the evidence in the literature regarding the care provided to the population by humanoid robots. **Methods.** A scoping review based on the guidelines established by the Joanna Briggs Institute. The Preferred Reporting Items for Scoping Review (PRISMA-ScR) checklist was followed. The review protocol was registered on the Open Science Framework under the number osf.io/6ur93. The search was conducted in November 2023 in the following databases: PubMed®, EMBASE®, LILACS, Web of Science, Scopus®, and CINAHL, as well as in the gray literature, including Google Scholar and the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (CAPES), using the search strategy: “humanoid robot*” AND “patient*”. **Results.** A total of 27 articles were analyzed. Most of the identified studies were conducted in hospital

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Conflicts of interest: None
Received: September 18th, 2024.
Approved: February 16th, 2025

How to cite this article: Ruiz, LKFT, Malaquias, TSM, Silva Junior, GB, Cunha, ICKO, Pimenta, RA, Dadalt, PA, Haddad, MCFL. Care provided by humanoid robots: a scoping review. 2025; 43(1):e11

DOI: https://doi.org/10.17533/udea.iee.v43n1e11

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

settings (*n*=13), with a primary focus on adults (*n*=10) and children (*n*=8). The countries with the highest number of publications were Japan (*n*=6), Canada (*n*=5), and France (*n*=4). Three areas of care were identified: social interaction (*n*=17), physical rehabilitation (*n*=7), and dissemination of health information (*n*=3). Additionally, only four studies involved collaboration between humanoid robots and healthcare providers. **Conclusion.** Despite the increasing use of humanoid robots in healthcare, it remains essential to enhance their integration with professionals in the field. Social interaction highlighted the need to improve patient care, underscoring the importance of aligning the capabilities of these robots with the expertise of healthcare providers. Accordingly, future research should focus on developing strategies that ensure this technology not only assists but also optimizes the quality of care and strengthens interdisciplinary collaboration.

Descritores: robôs humanoides; inteligência artificial; assistência ao paciente; assistência hospitalar; assistência ambulatorial; revisão de escopo.

Cuidados asistenciales prestados por robots humanoides: revisión de alcance

Resumen

Objetivo. Identificar la evidencia existente en la literatura científica sobre los cuiadados asistenciales prestados a la población por robots humanoides. **Métododos.** Revisión de alcance basada en las directrices establecidas por el Instituto Joanna Briggs. Se siguió la lista de verificación Preferred Reporting Items for Scoping Review (PRISMA-ScR). El protocolo de revisión se registró en el Open Science Framework con el número: osf.io/6ur93. La búsqueda se realizó en las siguientes bases de datos: Pubmed®, EMBASE®, LILACS, Web of Science, Scopus® y CINAHL, y en literatura gris, Google Scholar y el Catálogo de Tesis y Disertaciones de la Coordinación para la Mejora del Personal de Educación Superior (CAPES), utilizando como estrategia de búsqueda: «humanoid robot*» AND «patient*». **Resultados.** Se analizaron 27 artículos. La mayoría de los estudios identificados se realizaron en entornos hospitalarios (*n*=13), y se centraron principalmente en adultos (*n*=10) y niños (*n*=8). Los países que ocuparon un lugar destacado en las publicaciones fueron Japón (*n*=6), Canadá (n=5) y Francia (*n*=4). Se identificaron tres áreas de atención: interacción social (*n*=17), rehabilitación física (*n*=7) y difusión de información sanitaria (*n*=3); solamente se identificaron cuatro estudios que implicaban la colaboración entre robots humanoides y profesionales sanitarios. **Conclusión.** A pesar del creciente uso de robots humanoides en la asistencia sanitaria, sigue siendo esencial mejorar su integración con los profesionales sanitarios. La interacción social reveló la necesidad de mejorar la atención al paciente, lo que pone de manifiesto la importancia de alinear las capacidades de estos robots con los conocimientos de los profesionales sanitarios. Por tanto, la investigación futura debe centrarse en desarrollar estrategias para garantizar que esta tecnología no solamente ayude, sino que también optimice la calidad de la asistencia y refuerce la colaboración interdisciplinar.

Descriptores: Robótica; inteligencia artificial; atención al paciente; atención hospitalaria; atención ambulatoria; revisión.

Cuidados assistenciais desempenhados por robôs humanoides: scoping review

Resumo

Objetivo. Identificar as evidências na literatura quanto aos cuidados assistenciais prestados à população por robôs humanoides. **Métodos.** Revisão de escopo embasada nas diretrizes estabelecidas pelo Joanna Briggs Institute. Seguiu-se o *checklist* do *Preferred Reporting Items for Scoping Review (PRISMA-ScR).* O protocolo da revisão foi registrado na *Open Science Framework* com o número osf.io/6ur93. A busca ocorreu em novembro de 2023 nas bases de dados: *Pubmed®, EMBASE®, LILACS, Web of Science, Scopus®* e *CINAHL*, e na literatura cinzenta*, Google Scholar* e Catálogo de teses e dissertação da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), sendo utilizada como estratégia de busca: *"humanoid robot*" AND "patient*".* **Resultados.** Foram analisados 27 artigos. A maioria dos estudos identificados foi em ambientes hospitalares (*n*=13), com foco principal em adultos (*n*=10), e crianças (*n*=8). Os países que tiveram destaque nas publicações foram Japão (*n*=6), Canadá (*n*=5) e França (*n*=4). Foram identificadas três áreas de cuidados: interação social (*n*=17), reabilitação física (*n*=7), e disseminação de informações em saúde (*n*=3); além disso, foram identificados apenas quatro estudos que envolveram a colaboração entre robôs humanoides e profissionais de saúde. **Conclusão.** A pesar do crescente uso de robôs humanoides na área da saúde, ainda é essencial aprimorar sua integração com os profissionais da área. A interação social revelou a necessidade de melhorar a atenção ao paciente, evidenciando a importância de um alinhamento entre as capacidades desses robôs e o conhecimento dos profissionais de saúde. Dessa forma, pesquisas futuras, devem focar no desenvolvimento de estratégias que garantam que essa tecnologia não apenas auxilie, mas também otimize a qualidade do atendimento e fortaleça a colaboração interdisciplinar.

Descriptors: Robotics; artificial intelligence; patient care; hospital care; ambulatory care; scoping review.

Introduction

Technology in the healthcare sector has been gaining significant and gradual prominence since the Industrial Revolution, marked by sophisticated equipment, particularly for diagnostic purposes.(1) The global landscape presents major challenges concerning population health, requiring innovative and effective actions from technology industries focused on this field, considering that the global population is aging. It is estimated that by 2050, the world population over 60 years of age will reach approximately two billion, an increase of 900 million compared to 2015. People are living longer, however, they will be susceptible to chronic conditions that often lead to a dependence on care. In parallel with this context, there is a shortage of healthcare providers, which places enormous pressure on healthcare systems.(2)

Various technological tools play a crucial role in enhancing communication, productivity, and information management. The adoption of digital tools, such as videoconferencing platforms, has transformed work processes, leading to greater efficiency and cost savings. Consequently, the corporate world is under pressure to adopt technology to remain competitive in an evolving business environment.(3) Given this, it becomes necessary to reconsider population health, where innovative measures reshape the care process. In light of this concern, initiatives focused on technological innovations and artificial intelligence (AI) emerge as important tools to support care provision.(4) However, the integration of technological advancements into healthcare is not entirely new. A significant milestone occurred in the 1990s with the advent of robotic surgery, which enabled surgical procedures to be performed with greater detail and precision.(5)

More recently, the COVID-19 pandemic further reinforced the drive for technological adoption in healthcare, as there was a need to change the traditional care model.(6) As a result, global healthcare systems seek effective tools to combat diseases while also aiming for faster, more modern, and preferably cost-effective processes.(7) In this context, AI has the capability to approximate technology to human cognition, offering reasoning, strategies, speech, and even support for daily tasks.(4) Advancements in this area have led to the emergence of a bipedal robot with a humanoid appearance, known as a humanoid robot (HR), playing a significant role in improving the quality of life of individuals with physical or mental impairments.(8) This type of technology has been studied to facilitate healthcare-related activities. Additionally, there is growing concern in nursing regarding the alleviation of physical strain during bedside patient care, which is a leading cause of occupational illnesses and absences in this professional group.(9,10)

In Brazil, HRs have been utilized in various sectors, demonstrating their potential in multiple applications. Pilot studies have also explored the use of robots as receptionists in public offices, assisting visitors with navigation and inquiries.(11) Furthermore, HRs have been deployed in shopping centers, where they guide and provide information to the public. In an innovative initiative, a municipality in southern Brazil introduced a robot into the daily activities of a clinic for autistic patients. This Brazilian-made robot was initially designed for reception, training, and event-related functions.(12) Another example of innovation is a Brazilian technology hub that has developed HRs for various roles, including customer service in stores and supermarkets, advertising, events, and transporting supplies in laboratories.(13)

It is important to address the concept of robotic technology specifically applied to healthcare, which includes robots for telemedicine, remote hospital visits, and home care support for geriatric or post-hospitalization patients with other clinical conditions.(14) Although some of these robots do not strictly follow the humanoid model seen in international studies, Brazil has been investing in and recognizing the potential of this technology. These initiatives collectively highlight the diverse roles HRs play in Brazil, spanning healthcare, industrial environments, and attending the public. Accordingly, conducting a scoping review is justified to gather scientific evidence on this highly relevant topic. Therefore, this study aimed to identify the evidence in the literature regarding the care provided to the population by humanoid robots and how robotics is being applied in clinical practice, potentially having a direct impact on reducing healthcare system costs.

Methods

This study was a scoping review (SR), guided by the principles outlined in the Joanna Briggs Institute (JBI) manuals(15,16) and written following the Preferred Reporting Items for Scoping Reviews (PRISMA ScR).(17,18) The SR protocol was registered on the Open Science Framework (OSF) online platform under the number osf.io/6ur93 in December 2021. The database search was conducted in two phases: the first in August 2022, aimed at identifying studies on nursing practice that addressed care actions directed at assisting patients with diseases. This search revealed discrepancies in the types of care described, extending beyond the initially defined concept (search 1).

After conceptual adjustments among the reviewers, in which the results were explored and the scope and diversity of the care identified in the first search were analyzed, a new search was conducted in November 2023 using the same databases and search strategy, designated as search 2. In this phase, the concept of care was broadened to include any human-robot interaction intended to replace actions previously performed by healthcare providers, focusing on promoting well-being and patient care. The emphasis shifted to the role of humanoid robots (HRs) in healthcare delivery. The results of this search (search 2) provide the findings and are discussed throughout this article.

Eligibility criteria. The PCC (Population, Concept, and Context) acronym was used, based on the research question. The population comprised human beings, regardless of age, who received care provided by humanoid robots. The concept considered studies depicting care practices performed by bipedal robots with human-like characteristics. The context included studies conducted in any care settings, such as public and private hospitals, clinics, nursing homes, older adult care facilities, home environments, and others. The guiding question for this review was: "What care services are provided to the population by humanoid robots?" Studies that answered the research question were considered eligible, regardless of the publication period or language. Studies where the target population was not human and those focused on technical and operational aspects of robots were excluded.

Search strategy. The search was developed using key terms found in the Health Sciences Descriptors (DeCS) and the MeSH Database, combined with the Boolean operators "AND" and "OR" in the following electronic databases: PubMed®, Excerpta Medical Database (EMBASE®), Latin American and Caribbean Health Sciences Literature (LILACS), Web of Science, Scopus®, and CINAHL. Gray literature searches were also conducted using Google Scholar and the Coordination for the Improvement of Higher Education Personnel (CAPES) catalog of theses and dissertations. An initial search was performed in the PubMed® and Scopus® databases, defining the search strategy as: "humanoid robot" AND "patient*", adapted for each database. This stage was conducted with the support of a librarian from a public university in the state of São Paulo.

Study selection. All types of studies, case reports, protocols, clinical practice guidelines, theses, dissertations, and final academic projects were considered. Letters, editorials, articles with incomplete data (conference proceedings, pilot projects), review articles, and studies not available in full were excluded. Articles addressing humanoid robots in clinical practice, with complete text, detailed scientific methodology, and appropriate quality were included. Selected studies were exported to the Rayyan QCRI reference manager software, where duplicate studies were removed. The study selection proceeded in two stages: 1) title and abstract screening by two reviewers, selecting all eligible studies within the Rayyan manager; 2) full-text reading of the studies selected in the previous phase by the same reviewers. In cases of disagreement, a third reviewer conducted an evaluation.

Data extraction. Data were extracted by two reviewers using a spreadsheet created by the authors in Excel®. Extracted information included bibliographic details - title, author, publication year, Digital Object Identifier (DOI); language; institution, city, and country of study origin; sample size; study population characteristics; study objectives; methods, and main results; the role of the robots and type of care provided. The selected studies were categorized according to the nature of the care provided by HRs into the following categories: social interaction, physical rehabilitation, and health information dissemination. Social interaction included care in the form of therapeutic interventions aimed at promoting well-being, facilitating treatment, and improving health outcomes through effective communication, empathy, emotional support, and education. Studies addressing this type of intervention were classified under social interaction care.(19) Those focused on coordinated interventions designed to reduce disability and improve the quality of life of individuals with physical, mental, or emotional limitations were classified under physical rehabilitation care.(20) Studies centered on disseminating health-related information to improve service quality and patient knowledge were categorized as health information dissemination care.(21)

Data synthesis. Descriptive methods were used to present the data, which were expressed through a narrative approach and explanatory tables, detailed in the results section.

Results

In the second search, conducted in November 2023, a total of 521 studies relevant to the research were initially identified. After a rigorous exclusion process, 494 studies that did not meet the predefined criteria were removed, resulting in 27 selected publications that provided direct answers to the research question. These results are detailed in Figure 1.

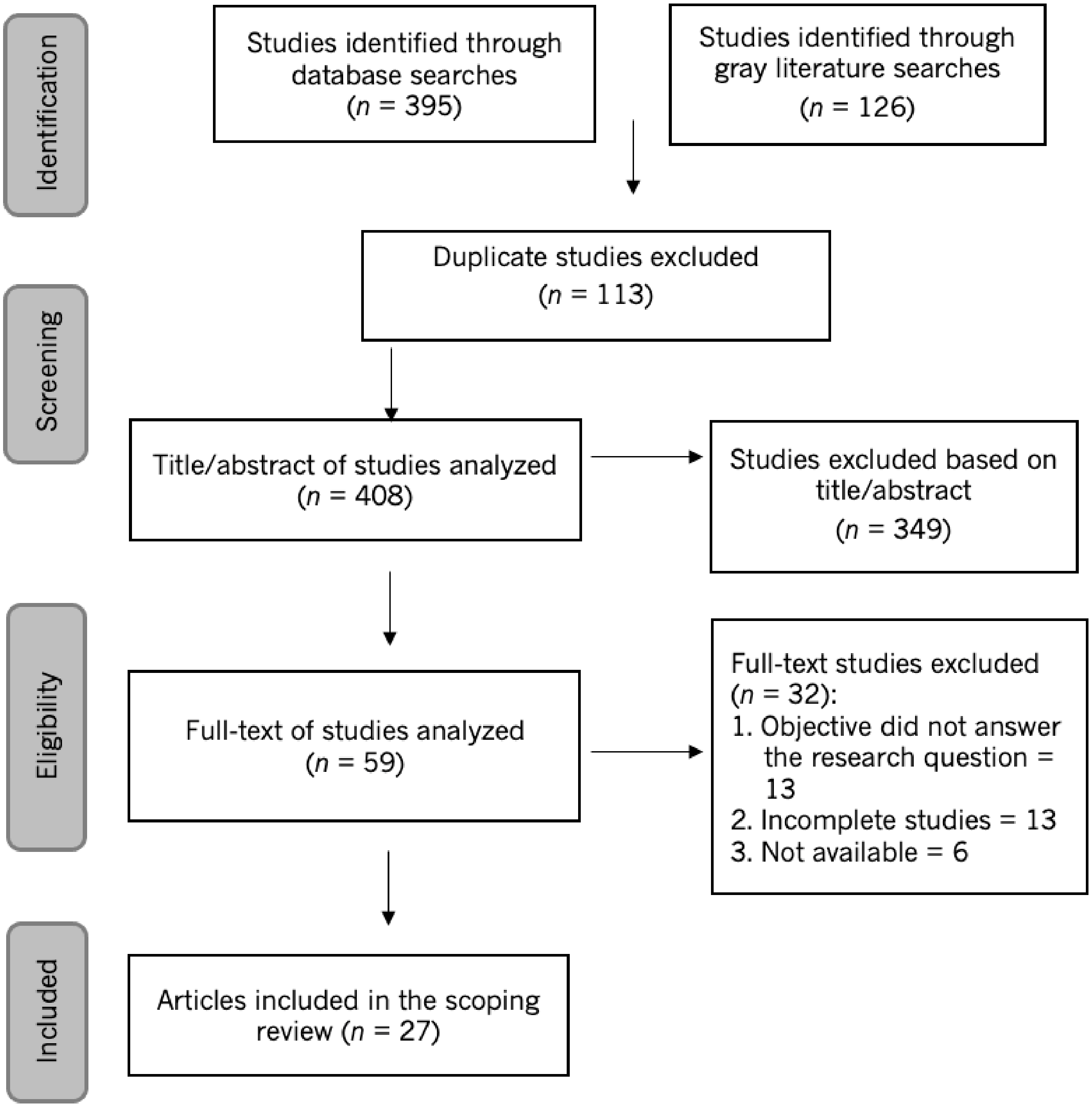

Figure 1. PRISMA flowchart of the results from search number 2, conducted in November 2023. Londrina, PR, Brazil, 2024

Of the studies included in the analysis, it was observed that 31.0% were conducted in Europe, with a notable concentration in France ($n = 4$), and another 31.0% in Asia. Within the Asian region, Japan stands out with a representation of 55.6% ($n = 6$), while 20.7% of the research was conducted in Canada ($n = 5$), and only one study was identified from Brazil.

The publication period of the studies spans from 2016 to 2023, with the majority (69.0%) being published between 2019 and 2021.(2, 22-35) The predominant language in the studies was English, present in 96.5% of the publications. In terms of the locations where the studies were conducted, 13 occurred in hospital environments(2, 22-24, 27, 28, 30, 31, 35-37, 39, 40) and nine in outpatient clinics.(26,29,33, 40-45) Furthermore, three studies(25,26,30) were carried out in long-term care facilities, three in university research centers,(32,34,48) and one in a private residence.(49) Two studies had two types of settings, outpatient and hospital.(30,40)

Regarding the type of population studied, ten of the studies were conducted with adults,(32,34,35,39,40,42,43,45,46,48) eight involved children,(2,22,27,28,36,37,41,44) seven focused on older adults,(25,26,30,31,33,43,49) and four targeted healthcare providers.(24,27,31,43) One study included a population of older adults, adults, and healthcare providers.(43) In the selected studies, it was observed that the humanoid robots (HR) were developed in both adult and child forms,(25,47) and even covered in fur to effectively interact with each type of patient.(48)

Regarding the areas of care addressed, social interaction was the most prevalent, representing 62.1% of the studies, followed by physical rehabilitation (24.1%) and health information (10.3%). These data are presented in Tables 1, 2, and 3 according to the chronological order of the life cycle.

Regarding the studies addressing social interaction, the majority were conducted with pediatric populations, with older adults, and to assist healthcare providers as an adjunct tool, optimizing treatment (Table 1).

Table 1. Characterization of the studies included in the scoping review related to care categorized as social interaction performed by humanoid robots

Author and year of publication	Study development location	Characteristics of the population	Robot's Role
Alemi *et al.*, 2016(36)	Mahak and Markaz-e-Tebi-Koodakan Hospitals (Tehran, Iran)	Children diagnosed with cancer aged 7 to 12 years.	The robot assumed the role of a therapist's assistant, with the goal of instructing children about their disease and symptoms, empathizing with them, and providing a space for them to express their fears and concerns.
Ali *et al.*, 2021(22)	Stollery Children's Hospital ED (Edmonton, Alberta, Canada)	Children undergoing intra-venous (IV) puncture.	The robot performed distraction therapy during IV, aiming to reduce suffering and pain in children.

Table 1. Characterization of the studies included in the scoping review related to care categorized as social interaction performed by humanoid robots (Cont.)

Author and year of publication	Study development location	Characteristics of the population	Robot's Role
Farrier, Pearson & Beran, 2020(27)	Alberta Children's Hospital (Alberta, Canada)	Children aged 2 to 15 years.	The robot interacted with children using strategies to distract them, such as telling jokes, playing music, and performing dances. Additionally, the robot used techniques such as encouragement, guided imagination, and breathing exercises.
Lee-Krueger *et al.*, 2021(2)	Tertiary pediatric hospital (Alberta, Canada)	Children undergoing intravenous puncture.	The robot taught deep breathing as a coping strategy for pain and fear in children.
Meghdari *et al.*, 2018(37)	Ali Asghar and Mahak Hospitals (Tehran, Iran)	Children aged 5 to 12 years diagnosed with cancer.	The robot interacted with children with cancer through storytelling, aiming to reduce their suffering.
Meyns *et al.*, 2019(28)	Primary school and University Hospital of Ghent (Ghent, Belgium)	Children with normal development and with oncological changes.	The robot engaged children in physical activity exercises. It also performed pre-programmed dances with music.
Uluer *et al.*, 2023(41)	Clinic (Istanbul, Turkey)	Children with hearing impairment.	The robot interacted in a personalized way during audiometry tests and rehabilitation, based on the children's needs, with the goal of improving their social connection, communication, and overall well-being.
Sarabia *et al.*, 2018(39)	Chelsea and Westminster Hospital (London, England)	Adults hospitalized for surgery, infections, or dementia.	The robot conversed, told jokes, played music, danced, and exercised with the patients.
Yoshida *et al.*, 2022(42)	Keio University School of Medicine (Tokyo, Japan)	Adults with social anxiety disorder (SAD) and autism spectrum disorder (ASD).	The CommU robot (Communication + U – You) allowed patients to communicate through it, avoiding eye contact with others, reducing anxiety, and increasing confidence in speaking.
Cohen *et al.*, 2017(47)	Department of Adult Psychiatry at the University Hospital of Montpellier (Paris, France)	Adults with schizophrenia.	The robot interacted using non-verbal signals, demonstrating facial expressions, hand gestures, body postures, and eye direction.
Chen *et al.*, 2020(25	Long-term care institutions (Hong Kong, China).	Older adults with dementia.	The robot, with a childlike appearance, performed interactions by speaking, singing, and shaking its head in response to various stimuli (e.g., knocks, tremors, and spoken words).

Table 1. Characterization of the studies included in the scoping review related to care categorized as social interaction performed by humanoid robots (Cont.)

Author and year of publication	Study development location	Characteristics of the population	Robot's Role
Chen *et al.*, 2020(26)	UAge Day Care Center (Taipei, Taiwan).	Older adults with neurocognitive diseases.	During group sessions, the robot stimulated the exchange of previous life experiences and the learning patterns of participants to improve interaction and communication skills.
Lee *et al.*, 2023(48)	Nursing homes (Seoul, South Korea)	Older adults from low-income backgrounds.	The Hyodol SAHR's reminded users to eat meals, take medications, attend medical appointments, and participate in social interactions. It encouraged guided exercises, including body movements and simple stretches, as well as recreational activities through popular songs and quiz games.
Tanioka *et al.*, 2021(30)	Psychiatric hospital and nursing home. (Tokushima, Japan)	Older adults with schizophrenia and dementia.	The robot conversed with older adults, creating a sense of connection and joy, indicating its potential to facilitate positive emotions in individuals with schizophrenia and dementia.
Beran et al., 2020(23)	Alberta Children´s Hospital (Alberta, Canada).	Healthcare providers.	The MedI® (Medicine and Engineering Designing Intelligence) robot interacted with children at the bedside, aligning with the functions and responsibilities of healthcare providers.
Beran et al., 2021(24)	Alberta Children´s Hospital (Alberta, Canada).	Healthcare providers.	The MedI® robot provided emotional support and engaged children in therapeutic activities. The robot was incorporated into the daily practices of healthcare providers.
Tanioka, 2019(29)	Rehabilitation facilities for older adults. (Okayama, Japan)	Occupational therapists and nurses.	The robot acted as a mediator in the relationship between the older adult and the occupational therapist, facilitating communication and interaction.

In the context of physical rehabilitation, it can be seen that most studies investigated the use of robots as an auxiliary tool in the practice of physical exercise, with good interaction with patients (Table 2).

Table 2. Characterization of the studies included in the scoping review related to care categorized as physical rehabilitation actions performed by humanoid robots

Author and year of publication	Study development location	Characteristics of the population	Robot's Role
Blanchard *et al.*, 2022(45)	Rehabilitation centers in Brittany (Brittany, France)	Adults with low back pain, incomplete spinal cord injury, and nonspecific chronic low back pain.	The robot supervised and guided participants in performing stretching exercises for chronic lower back pain.
Platz *et al.*, 2023(40)	University Medical Center of Greifswald and Greifswald Clinic (Greifswald, Germany)	Adults post-stroke with severe hemiparesis.	The robot welcomed the patient individually and explained the therapeutic goal, the prescribed therapy, and how the individual training tasks worked. It provided audiovisual instructions through photos and videos, offered feedback according to the type of therapy, and provided breaks as needed.
Feingold-Polak *et al.,* 2021(46)	"Adi Negev" Rehabilitation Center (Jerusalem, Israel)	Adults post-stroke.	The robot interacted with participants, providing feedback, displaying images for correction, and motivating them to continue their rehabilitation exercises.
Garcia, 2019(32)	Technology Center of the Federal University of Santa Maria – RS (Santa Maria, Brazil)	Individuals over 18 years of age.	The robot served as a motivational tool for physical exercises and their psychological aspects through interactions with participants. It aimed to encourage and engage individuals during exercise practice.
Aubin *et al.*, 2021(34)	Montpellier University (Montpellier, France)	Adults with schizophrenia.	The NAO robot (Japanese word = simple) acted in two ways. It synchronized movements with the patients, and at other times, it performed the movement, and the patient observed to replicate it later.
Ujike *et al.*, 2019(31)	Mifune hospital (Kagawa, Japan)	Older adults with schizophrenia and decreased physical function who needed to move in a wheelchair.	The robot intentionally communicated with the patient, asking questions about their knowledge and experiences, and the patients answered the questions. Patients actively participated in the Care Prevention Exercises using Pepper-CPGE and followed its instructions while demonstrating calisthenics exercises.
Tanioka *et al.*, 2020(33)	Facilities for the elderly (Japan)	Older adult, 69 years of age, with schizophrenia.	The robot assisted in performing Care Prevention Gymnastics Exercises (Pepper-CPGE) through an audio device, lasting 3 minutes.

Regarding health information, few studies were identified, and all applied robots as a tool for transmitting important health information, with a primary focus on patients (Table 3).

Table 3. Characterization of the studies included in the scoping review related to care categorized as health information dissemination performed by humanoid robots

Author and year of publication	Study development location	Characteristics of the population	Robot's Role
Al-Taee *et al.*, 2016(44)	King's College Hospital waiting room (London, England)	Children with type I diabetes mellitus (DM).	The robot provided guidance on managing DM, including information on blood sugar monitoring, insulin administration, and maintaining a healthy lifestyle. It supported the education of children on DM self-care and promoted healthy habits.
Stoevesandt *et al.*, 2021(35)	Halle University Hospital (Saale, Germany)	Adults undergoing elective magnetic resonance imaging examination.	The robot interacted with patients and conveyed information about the magnetic resonance imaging examination through voice commands and body language.
Blavette *et al.*, 2022(43)	Memory Clinic of the Broca Hospital and Rehabilitation Clinic of the Vaugirard Hospital (Paris, France)	Older adults, caregivers, and healthcare providers.	The robot communicated information through both verbal and non-verbal behaviors, presenting COVID-19 precautions based on official information.

Discussion

The global health of the population is influenced by various factors, including technological advancements and the impact of the Fourth Industrial Revolution,(49) which began in the current century. Robotics is part of this context, and the present study provides a comprehensive review, highlighting its predominant application in healthcare in European and Asian countries.(50) The Fourth Industrial Revolution, as described by Klaus Schwab in 2016, is transforming the healthcare sector through technologies like artificial intelligence, biotechnology, and the Internet of Things. These innovations are changing the way healthcare services are provided and managed, increasing efficiency and personalized access to care. The integration of these technologies could create a more ethical, inclusive, and sustainable future. Experts in machine learning and data ethics are essential to ensure that these advancements improve global quality of life and safety.(51)

Isaac Asimov, one of the pioneers of science fiction, envisioned as early as the 1940s a future in which robots and humans coexisted for the progress of humanity. His stories reflected on the ethical and social implications of robotics, emphasizing the safe integration of robots into society, from household tasks to complex functions. Asimov addressed moral dilemmas, exploring the responsibility of intelligent robots. He predicted that, with technological advancements, robots could develop a deep understanding of human emotions and become valuable allies.(52)

The new healthcare model created by the Fourth Industrial Revolution was presented at the Hannover Fair in 2011 in Germany, involving the automation of industrial processes, merging digital technology, artificial intelligence, and connectivity.(53) From this, humanoid robots emerged, an advanced form of automation capable of performing complex tasks that were previously carried out exclusively by human workers.(54) In the present study, it was identified that in the healthcare sector, robots use gestures, speak, perform facial recognition, move, and, in general, promote social interaction to assist patients, aiming to provide care and achieve measurable progress in recovery, rehabilitation, learning, and well-being. Currently, healthcare companies are innovating in the production and development of robots to meet the universal technological demands of this field.(35) As identified in this study, research in robotics in Europe is extensive and distributed across the region. Different European countries have made significant contributions to the advancement of robotics in various areas, such as industrial robotics, medical robotics, service robotics, and autonomous robotics.(55) Germany is known for its strong engineering and automation industry, with German companies playing a crucial role in the development of industrial robots and automation systems.(56,57) Collaboration between research institutions, universities, and industries across Europe is common, supporting the ongoing development and advancement of robotics in the region.(58) Other studies occurred in the Asian continent, certainly reinforced by Japan, which has a long history of creating industrial robots and is a leader in service robotics. Japanese companies have developed advanced humanoid robots for various applications, including care and entertainment for older adults.(59) The Japanese government strongly supports the development of care robots to address the challenges of an aging population and the shortage of healthcare providers.(60)

The COVID-19 pandemic increased visibility and interest in the use of AI technologies and robots on the frontlines of healthcare, justifying the rise in publications on the topic since 2016, with a surge after 2019. During this period, robots were introduced into the medical sector to perform support tasks, while more complex activities remained the responsibility of professionals. In addition to minimizing contact between infected patients and healthcare providers, research advanced in the teleoperation of robots, allowing remote control for monitoring vital signs and other medical procedures.(61,64) Regarding the type of care found in the results of this review, robot-patient interactions were highlighted across various age groups; these interactions impact engagement and adherence to the proposed treatment,(37) as humanoid robots have the ability to act as agents of therapeutic distraction during medical procedures, alleviating anxiety and discomfort associated with clinical interventions.(65)

Health information care was also identified, where the robot continued interacting with the human, but the primary goal was to transfer health information consistently and accurately, following established protocols and guidelines, ensuring that all patients received the same quality information, regardless of when they interacted with the robot.(43) Through the studies analyzed, it was found that one of the populations studied was children. Research in the pediatric area can be justified by the creativity and imagination of this audience: some findings demonstrated the use of humanoid robots in educating children with specific health problems or special needs, developing childhood skills, promoting healthy behaviors, and providing comfort during medical procedures.(66,67)

By providing entertainment and playful interaction, these robots can modulate pain perception and facilitate the completion of medical procedures, making the experience more tolerable, especially for children.(68) In this age group, the human-robot interaction can also stimulate their emotional and social development, offering companionship and emotional support, therefore reducing the feeling of fear.(68) The ability of these robots to express emotions and respond sensitively to children's emotions can contribute to the effectiveness of treatment, prognosis, and, above all, quality of life.(28)

The interest in the adult population can be demonstrated by the ability to personalize treatment, which involves adapting instructions to meet the specific needs of patients, providing the best outcomes in rehabilitation and medical care. As mentioned earlier, this began in 1990 with advancements in the field of robotic surgery.(69) Some studies investigated rehabilitation care using humanoid robots to assess their effectiveness in improving physical function in adults after injuries, strokes, or surgeries.(40) In the literature, studies(71,74) investigated parameters such as muscle strength, range of motion, and motor coordination. The use of robots in upper limb rehabilitation has shown promising results in improving musculoskeletal functions, including strength, sensation, perception, vibration, muscle development, spasticity reduction, flexibility, and range of motion.(70,73) These findings present a relatively small sample, which may limit the representativeness of the results in relation to the broader population of studied diagnoses. Moreover, the detailed characterization of participant diversity, including variables like age, gender, and disease severity, is not always explored, thus influencing the generalization of results, as different clinical profiles may respond differently to the intervention.

The scientific interest in rehabilitation with HRs is multifaceted and spans various research areas; in general, researchers are interested in determining the effectiveness of humanoid robots as rehabilitation tools compared to traditional methods.(31) There is an interest in developing robotic systems that can be adapted to the specific needs of each patient, personalizing treatment to the individual capabilities and goals of each one.(74) Overall, HRs offer an innovative and promising approach to patient rehabilitation, complementing the work of human therapists and offering unique benefits that may help patients achieve their rehabilitation goals more effectively.(40)

On the other hand, the connection of AI with robotics provides means to meet some of the care needs of other population groups, such as older adults. Concerning older adults, international literature confirms that the population aged over 60 is growing at an accelerated rate compared to other age groups in developed countries and even those in development, such as Brazil.(75) In Japan, the aging population is inversely proportional to birth rates: the older adult population is growing significantly. As a result, research focusing on analyzing ways to meet the demands and vulnerabilities of older patients stands out,(29) providing assistance in daily tasks such as mobility, personal hygiene, and health monitoring. Robots can be equipped with sensors to monitor signals of interest in older adults, such as blood pressure, heart rate, and blood glucose levels. This allows for early detection of health problems and a rapid response in case of emergencies.(76,77) One point of attention is ensuring that systems operate safely and reliably, especially in health-related care. Failures in the system can lead to unexpected or inappropriate movements, putting the patient's safety at risk.

The literature presents the application of robotics in assisting older adults with Alzheimer's disease, which, in its early stages, can provide significant benefits, particularly by promoting autonomy, stimulating cognitive functions, and offering emotional support, contributing to the improvement of these individuals' quality of life. However, the implementation of these technologies is not without obstacles, including ethical issues, privacy concerns, and the need for high-quality training data to ensure effective human-robot interaction.(83)

HR are also known as bipedal robots and are used in less complex care to minimize the overload on the healthcare system, prioritizing the care provided by nursing professionals for more complex situations.(43) The literature shows HRs in long-term care facilities, providing company to older adults and those requiring palliative care;(78) thus, in addition to promoting a better quality of care, robots allow the healthcare team to focus on other tasks for patients.(68) The natural social isolation of older adults, caused by health conditions, reduced mobility, or lack of family support, aggravates clinical complications and functional decline, increasing vulnerability to new diseases. In this context, HRs have shown potential to act in rehabilitation, as well as provide company and social interaction, helping to reduce isolation, promote emotional well-being, and offer entertainment, especially in cases of mental health issues such as depression and anxiety.(26,48) Another population studied includes healthcare providers.(29,27,24,43) Various factors such as stress, occupational risks, dual work shifts, and low wages can lead to burnout, impairing their health, quality of life, and even their performance in delivering care.(45) Therefore, findings support that robots do not aim to replace these healthcare providers; their role will always be to provide true human care, and with the help of robots, they can focus on actions requiring human relationships and more complex treatments.(79)

It is worth noting that, despite the availability of numerous training programs for those wishing to work in this field, the demand for qualified professionals continues to rise. This is due to both the accelerated aging of the population and the increasing demand for general care; thus, there is a trend toward a shortage of labor in healthcare.(80) However, the insertion of humanoid robots in the care process may allow healthcare providers to focus on care that must exclusively be provided by them.

HR can be placed in strategic locations such as hospitals, clinics, or healthcare centers, where they can provide health information in an accessible manner to a wide range of people, regardless of their geographical location or technological skills. Unlike healthcare providers, who have work hour limitations, bipedal robots can be available to provide health information at any time of the day, thus increasing accessibility to healthcare.(81) Additionally, humanoid robots can help reduce the workload of healthcare providers, allowing them to concentrate on more complex and demanding cases.(82)

The conclusion of this study is that, although the use of humanoid robots in healthcare is increasing, particularly in hospitals, there is still a strong need for better integration between these machines and healthcare providers. The focus on social interaction in many studies suggests an opportunity to improve the patient experience, but also highlights the need to further investigate physical rehabilitation and information sharing. Thus, future research should aim to create protocols that successfully combine the abilities of humanoid robots with the knowledge of healthcare providers, ensuring that technology not only supports but also improves the quality of patient care and fosters a more effective team-based work environment, always within the ethical principles of healthcare practice.

In terms of study limitations, it can be considered that the clarity of the topic influenced the selection of studies, affecting the robustness of the data and the consistency of the established parameters. The limited sample of studies impedes the generalization of the results. Moreover, the inclusion of research in early stages, combined with restricted access to databases and scientific publications, compromised the breadth and depth of the analysis. Despite these limitations, the results provide an important foundation for future investigations, with potential to guide healthcare practices and policies. The study seeks to deeply integrate technology into healthcare, offering insights to improve service quality, as several countries are becoming potential hubs for robotics innovation in healthcare.

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Original Article

Affective states and stress in health-professional caregivers of people with functional diversity: the important role of empathy and social support as mediators of this relationship

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Conflicts of interest: None.
Received: October 14th, 2024.
Approved: March 4th, 2025.

How to cite this article: Garcia-Marin E, Perez-Marin M, Martínez-Cuevas A, Valero-Moreno S. Affective states and stress in health-professional caregivers of people with functional diversity: the important role of empathy and social support as mediators of this relationship. Investigación y Educación em Enfermería. 2025; 43(1):e12.

DOI: https://doi.org/10.17533/udea.iee.v43n1e12

UNIVERSIDAD
DE ANTIOQUIA
1803

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Affective states and stress in health-professional caregivers of people with functional diversity: the important role of empathy and social support as mediators of this relationship

Abstract

Objective. The aim of this study was to analyse how empathy and social support mediate levels of perceived and relational stress, depending on the person's type of affect. **Methods.** This was a multicentre, cross-sectional, descriptive study. The sample consisted of 756 working health professionals for people with functional diversity in the province of Valencia. The following scales were analysed: (i) Perceived Stress Scale; (ii) The Nurse Stress Scale; (iii): Empathy Quotient (EQ); (iv) Social Support Questionnaire, and (v) Scale of Positive and Negative Affects. Descriptive statistics, reliability tests, comparison of means, correlation coefficients and PROCESS were performed. **Results.** The findings showed that stress was positively correlated with negative affects, and negatively correlated with empathy, social support and positive affects, and that these variables influence perceived stress, significantly reducing its levels, while the effect of these variables on relational stress was not significant. **Conclusion.** The data obtained highlights the importance of empathy and a good social support network in these professionals and how this will influence the care and relationship with the users.

Descriptors: caregiver burden; intellectual disability; stress; empathy; social support; emotional regulation.

Estados afectivos y estrés en cuidadores profesionales de personas con diversidad funcional: el importante papel de la empatía y el apoyo social como mediadores de esta relación

Resumen

Objetivo. El objetivo de este estudio fue analizar cómo la empatía y el apoyo social median en los niveles de estrés percibido y relacional, dependiendo del tipo de afecto de la persona. Método. Se trata de un estudio multicéntrico, transversal y descriptivo. **Métodos.** La muestra fue de 756 profesionales sanitarios que atienden a personas con diversidad funcional de la provincia de Valencia. Se analizaron las siguientes escalas: (i) Escala de estrés percibido; (ii) Escala de estrés relacional en enfermería (iii): Cociente de Empatía (EQ); (iv) Cuestionario de apoyo social, y (v) Escala de afectos positivos y negativos. Se realizaron estadísticos descriptivos, pruebas de fiabilidad, comparación de medias, coeficientes de correlación y PROCESS. **Resultados**. Los resultados mostraron que el estrés se correlacionó positivamente con los afectos negativos, y negativamente con la empatía, el apoyo social y los afectos positivos, y que estas variables influyen en el estrés percibido, reduciendo significativamente sus niveles, mientras que el efecto de estas variables sobre el estrés relacional no fue significativo. **Conclusiones.** Los datos obtenidos ponen de manifiesto la importancia de mostrar empatía y una buena red de apoyo social en estos profesionales y cómo esto influirá en la atención y relación con los usuarios.

Descriptores: carga del cuidador; discapacidad intelectual; stress; empatia; suporte social; regulación emocional.

Estados afetivos e estresse em cuidadores profissionais de pessoas com diversidade funcional: o importante papel da empatia e do apoio social como mediadores dessa relação

Resumo

Objetivo. O objetivo deste estudo foi analisar como a empatia e o apoio social mediam os níveis de estresse percebido e relacional, dependendo do tipo de afeto da pessoa. **Método.** Trata-se de um estudo multicêntrico, transversal e descritivo. Métodos. A amostra foi composta por 756 profissionais de saúde que atendem pessoas com diversidade funcional na província de Valência. Foram analisadas as seguintes escalas: (i) Escala de estresse percebido; (ii) Escala de estresse de enfermagem; (iii): Quociente de Empatia (QE); (iv) Questionário de apoio social e (v) Escala de experiências positivas e negativas. Foram realizadas estatísticas descritivas, testes de confiabilidade, comparação de médias, coeficientes de correlação e PROCESS. **Resultados.** Os resultados mostraram que o estresse foi positivamente correlacionado com o afeto negativo e negativamente correlacionado com a empatia, o apoio social e o afeto positivo, e que essas variáveis influenciaram o estresse percebido, reduzindo significativamente seus níveis, enquanto o efeito dessas variáveis no estresse relacional não foi significativo**. Conclusões.** Os dados obtidos mostram a importância de demonstrar empatia e uma boa rede de apoio social nesses profissionais e como isso influenciará no cuidado e no relacionamento com os usuários

Descritores: carga do prestador de cuidados; deficiência intelectual; stress; empatia; apoio social; regulação emocional.

Introduction

Long-term care tasks in healthcare services are primarily performed by professional caregivers. Professional caregivers are individuals external to the family nucleus who possess training in caregiving skills and receive financial remuneration for their work health professionals, including nurses, psychologists, assistants, orderlies, occupational therapists, social workers.(1) This professional tasks entails performing tasks that address the demands of users and services, typically resulting in high levels of stress that negatively impact both the caregiver and the person receiving care, hindering the development of healthy caregiving relationships.(2) The various tasks involved in the professional care of people with functional diversity often lead to significant psychological distress, such as loss of interest, low self-esteem, feelings of guilt, fatigue, or lack of concentration, among other symptoms.(3) Consequently, these professionals often exhibit significant psychological sequelae that affect their ability to cope healthily with their daily work, with stress being a central clinical element inherent in their experience of work life.

In the care of people with functional diversity, these stress levels vary mainly depending on the type of limitation and the degree of dependency of the person receiving assistance, finding three levels established by the dependency law in Spain: Grade I (moderate dependency), Grade II (severe dependency) or Grade III (great dependency).(4,5) Studies highlight the importance of distinguishing, within the clinical domain of stress, two elements: perceived stress, which refers to the extent to which various life situations are interpreted as stressful;(6,7) and high levels of relational stress, defined by Jones *et al.*(8) as the set of stressful life events that threaten personal relationships and generate experiences of isolation. In short, it refers to the discomfort generated by relationships with other people in the exercise of work functions.(9) Furthermore, authors such as Ajzen(10) and Christian, Beaujean & Wright(11) use terms like affect or affective states to refer to a concept that encompasses both emotions (defined as a state or quality of feeling at a given moment) and moods (defined as a predominant emotional tone or general attitude). Positive affect refers to positive emotional states, including motivation, creativity, and confidence. In contrast, negative affect refers to negative emotional states associated with discomfort, fear, or insecurity.(12) Embracing this idea and conceptualizing affective states as a global concept, it is important to analyze the influence of affect on the degree of stress experienced by professional caregivers.

Psychological difficulties linked to stress, such as psychosomatic, depressive, and anxious symptoms, exhibit high comorbidity.(13,14) Following Clark and Watson's(13) tripartite model as an important framework, studies primarily suggest comorbidity in adults related to anxiety and depression,(12,14) highlighting the central role of affect in psychological disturbance under circumstances of high stress (considering the existence of a common substrate for anxiety and depression, which is negative affective state, explaining the extensive overlap and high comorbidity between depression and anxiety; a positive affective state (such as happiness), which in low levels characterizes depression; and a physiological state of hyperactivation (a fundamental component of fear), which characterizes anxiety).(15) Clinical research primarily focuses on identifying variables that, when enhanced in the caregiving context, may mediate psychological difficulties, such as high levels of stress. Among these mediating variables, empathy is defined as the ability to understand, interpret, and respond to others' emotions.(16,17) Social support refers to the set of expressive or instrumental services (which can be perceived or received) provided by trusted people, by the social networks that the person has or by the community, and which can occur both in everyday situations and in crisis situations.(18)

The literature highlights the protective role of empathy against work-related disorders such as burnout.(19) Studies also suggest that the use of adaptive coping styles by professional caregivers, such as problem-solving, high motivation, or emotional management, are associated with lower levels of perceived stress and greater well-being.(20) Conversely, conditions such as lack of social support, high demands, and low control have been linked to elevated levels of stress and burnout among caregivers.(21) Research has demonstrated that having good social support reduces the negative consequences and stress levels associated with caregiving,(22) and positive affectivity promotes personal development in various life domains, including work and social aspects.(23) Therefore, evidence highlights the mediating role of variables such as support and empathy in caregiving for others, particularly in the field of functional diversity. In this regard, the Person-Centered Care Model proposes a more humanistic and individualized approach to care, where a relationship of equals is built between caregiver and user, with shared decision-making and a focus on autonomy and personal development.(24,25) Literature on this model demonstrates that promoting autonomy and positive affectivity regarding care is associated with lower levels of stress and tension in caregivers, with social support received from colleagues and during multidisciplinary work playing an important role.(26-28)

Methods

Objectives and hypotheses. Building upon these existing concepts in the scientific literature, the objective of this study was to analyze how stress levels in professionals working in the care of people with functional diversity are influenced by the experience of positive and negative affect in these caregivers, and how this relationship is mediated by the level of empathy and social support they exhibit. The hypothesis of this study were three: (1) Positive affect will positively correlate with positive variables such as empathy and social support. Conversely, negative affect will positively correlate with higher levels of perceived stress and relational stress; (2) Positive affect will reduce the occurrence of high levels of perceived stress and relational stress, while negative affect will increase the levels of both types of stress; and (3) Social support and empathy will mediate the relationship between affect and stress, reducing levels of perceived stress and relational stress.

Study design and procedure. This was a multicentre, cross-sectional, descriptive study. The study focused on social and health care centres for people with functional diversity. The information collection process was collected between 7 June 2021 and 15 July 2021. The sample consisted of professionals in the social and health care field belonging to care centres for people with intellectual disabilities in the province of Valencia, Spain. With regard to the inclusion criteria, we looked for people who were working (between 18 and 65 years of age), and who had been working for at least one year in the social and health care field in care centres for functional diversity in the Valencian Community. With regard to the exclusion criteria, people who showed any type of mental disorder previously diagnosed at the time of data collection were excluded.

Participants. In total, there were 756 people, of whom 78.6% (*n*=576) were women, and 21.4% were men (SD= 0.41), aged between 18 and 68 years (M=43.40, SD=11.09). Of the group of participants, 33.5% were carers (*n*=221), 27.7% were monitors (*n*=186), 1.5% were social workers (*n*=10), 10.2% were psychologists (*n*=67), 3. 6% were speech therapists (*n*=24), 9.4% were physiotherapists (*n*=62), 2% were social integrators (*n*=13), 2.7% were occupational therapists (*n*=18), and 9.4% were auxiliary services (*n*=62). The participants belonged to different centres (SD= 1.53): 8.86% belonged to early intervention centres (*n*=67); 15.08% belonged to day care centres (*n*= 114); 34.4% belonged to occupational centres (*n*= 260); 27.78% belonged to residential care centres (*n*= 210); and 5.95% belonged to sheltered housing (*n*= 45).

Study variables. Information was collected on the demographic variables of the participating professionals, including: gender, age, professional role, job position, type of work centre, training in communication skills with people with functional diversity, and training in counselling. On the other hand, the study variables analysed were perceived stress and relational stress, psychological well-being, empathy and social support.

Instruments. (i) To assess perceived stress, the Perceived Stress Scale (PSS)(5) was used. This instrument evaluates situations perceived as stressful in daily life. It consists of 14 items with a Likert-type response format ranging from "never" (0) to "always" (4), asking participants to rate the frequency of stressful events in the past month. Scores range from 0 to 56, with higher scores indicating higher levels of stress. In this study, the questionnaire showed a reliability of α=0.73, along with adequate validity and sensitivity; (ii) To assess relational stress, the *Nurse Stress Scale*(29) was employed. This scale aims to identify the extent to which certain aspects are perceived as stressful for care or nursing staff.(30) The questionnaire consists of 34 items with a Likert-type response format ranging from "never or almost never" (0) to "always or almost always" (4), describing various potential physical and psychological stressors. This scale demonstrated a reliability of α=0.75 in this study; (iii) Empathy was assessed using the *Empathy Quotient* (EQ)(31) in its short form validated by Redondo & Herrero-Fernández.(32) This instrument consists of 23 items evaluating the affective and cognitive components of empathy, with a Likert-type response format ranging from "strongly disagree" (0) to "strongly agree" (3). For this research, the Cognitive Empathy dimension was studied, showing a reliability of α=0.55; (iv)To assess social support, the Social Support Questionnaire,(33) adapted for the Spanish population(34) was used. This scale evaluates the affective (expressions of love or group belonging) and confidential (possibility of having people to share concerns and problems with) dimensions of social support. It consists of 11 items with a Likert-type response format ranging from "Much less than I want" (1) to "As much as I want" (5). This questionnaire showed a reliability of α=0.85 in this study, with α=0.79 for confidential support and α=0.70 for affective support; (v) Psychological well-being, based on the affective states experienced, was assessed using the Scale of Positive and Negative Experience (SPANE).(35) This instrument consists of two subscales, each with 6 items, and a Likert-type response format ranging from "rarely/never" (1) to "very often/always" (5), referring to positive affects (SPANE-P) and negative affects (SPANE-N). The reliability for SPANE-P was α=0.89 and for SPANE-N was α=0.81.

Data collection. Data collection was carried out by members of the research team. The team psychologist communicated the characteristics of the study to the participants, ensuring the commitment to confidentiality and informed consent. The application of tests and questionnaires was applied by members of the research team to those professionals who, voluntarily, wanted to participate in the study.

Data analysis. Statistical analyses in this research utilized the SPSS 28.0 statistical package for Windows along with the PROCESS macro extension for SPSS. The following tests were conducted: Descriptive statistics (frequencies (Fr), percentages (%), means *(M)*, and standard deviations (SD); Reliability tests (Cronbach's α) to assess the reliability of the questionnaires used; Comparison of means (Student's t-test for independent samples and One-Way ANOVA) to test hypotheses of equal means; Pearson correlation coefficient to assess the degree of relationship between variables; and PROCESS to analyze the moderating and mediating effects of two variables on the relationship between other two variables.

Ethical considerations. Regarding the ethical implications of the research, the research group undertook to sign the confidentiality commitment and inform the participants in detail, following the regulations of the 1964 Declaration of Helsinki, of the objectives of the project and what their participation will be, as well as the benefits that the results will entail. Likewise, the research group undertook to establish the requirements and conditions indicated in the Organic Law 3/2018, of 5 December, on Personal Data Protection and guarantee of digital rights, and Regulation (EU) 2016/679, of the Parliament and of the Council, of 27 April, on the protection of natural persons with regard to the processing of personal data and on the free movement of such data for the fully confidential processing of their personal data, as well as the European regulations in force. To this end, individuals will be informed, informed consent and a commitment to confidentiality will be requested.
The UV Ethics Committee has given its approval with the code UV-INV_ETICA-24773412.5.

Results

Descriptive statistics

The results obtained at the statistical level, based on mean differences, indicate significant variations primarily in empathy, perceived social support, and both perceived and relational stress. However, no significant differences were found in positive and negative affect. Differences emerged between certain groups of professionals (Table 1). For instance, in terms of empathy, caregivers and assistants exhibited the lowest levels compared to monitors, social workers, and psychologists.

Regarding social support, mean scores were highest among psychologists, with speech therapists showing particularly high levels compared to caregivers, service assistants, and monitors. In terms of stress, caregivers and monitors reported higher levels of perceived stress compared to psychologists. For relational stress, psychologists and monitors exhibited higher levels than caregivers and assistants, though lower than occupational therapists.

Considering overall scores, we examined ranges rather than absolute cut-off points. Perceived relational stress was generally moderate across all professional groups, while perceived social support was consistently high. In the case of empathy, greater variability was observed, with both high and low levels present across different professions. Finally, in terms of emotional balance, a relative equilibrium between positive and negative affect was found, with positive affect generally prevailing.

Correlations and descriptive statistics of study variables

The correlation between cognitive empathy, social support, and the psychological variables of the study was examined. It was found that empathy significantly positively correlated with positive affect and social support, and negatively correlated with negative affect, perceived stress, and relational stress. Additionally, social support significantly positively correlated with positive affect and empathy, and negatively correlated with perceived stress and negative affect. Regarding the psychological variables, perceived stress significantly positively correlated with negative affect and relational stress, and negatively correlated with positive affect. Relational stress significantly positively correlated with negative affect and negatively correlated with empathy. The results are presented in Table 2.

Table 1. Descriptive statistics of the study variables according to professional role and comparative means

		C	I	SW	Psyc	ST	Phys	SI	OT	AS	F (p)	η²
Empathy	Mean	25.55	26.86	27.70	27.41	26.91	15.02	14.61	15.33	14.10	5.18 (0.001)	0.06
	SD	3.27	2.80	1.42	1.85	3.16	3.24	3.18	2.42	3.27		
	Range	14.00	16.00	4.00	8.00	10.00	12.00	8.00	7.00	11.00		
Social support	Mean	43.82	45.73	48.00	56.98	49.38	45.76	45.92	40.41	41.93	4.39 (0.001)	0.06
	SD	7.73	6.23	8.46	6.61	4.30	7.46	9.50	12.02	10.42		
	Range	42.00	30.00	22.00	21.00	15.00	34.00	24.00	30.00	32.00		
Perceived stress	Mean	23.10	22.98	21.50	19.61	22.05	23.13	23.63	24.60	22.04	2.43 (0.014)	0.03
	SD	6.64	6.10	5.25	5.51	5.80	6.51	4.48	3.87	6.04		
	Range	32.00	26.00	14.00	19.00	20.00	27.00	16.00	16.00	26.00		
Relational stress	Mean	35.84	32.95	33.75	33.73	33.71	33.51	32.60	39.14	29.50	7.02 (0.001)	0.10
	SD	7.34	5.40	6.25	5.07	5.67	5.61	6.24	4.77	4.90		
	Range	33.00	23.00	18.00	22.00	9.00	25.00	21.00	16.00	23.00		
Positive affects	Mean	18.51	18.67	19.60	19.20	19.52	18.79	20.00	18.59	18.17	1.22 (0.28)	0.02
	SD	3.30	2.47	1.96	2.24	2.09	3.05	2.86	3.02	3.43		
	Range	15.00	14.00	5.00	8.00	10.00	12.00	10.00	12.00	14.00		
Negative affects	Mean	14.90	14.66	14.00	14.00	13.63	15.02	14.62	15.33	14.11	1.07 (0.38)	0.01
	SD	3.73	3.43	2.83	2.60	4.39	2.72	2.55	3.53	3.46		
	Range	23.00	21.00	8.00	11.00	15.00	13.00	7.00	12.00	15.00		

C= Caregiver; I= Instructor; SW= Social Worker; Psyc= Psychologist; ST= Speech Therapist; Phys= Physiotherapist; SI= Social Integrator; OT= Occupational Therapist; AS= Auxiliary Services.

Post-hoc* test. Emphaty:** Caregiver < Instructor, Social Worker and Psychologist; Instructor, Social Worker and Psychologist > Auxiliar Services. ***Social support: Caregiver < Psychologist and Speech Therapy; Instructor < Speech Therapy; Speech Therapy > Auxiliar Services. ***Perceived stress:*** Caregiver, Instructor > Psychologist. Relational stress: Caregiver < Instructor and Auxiliar Services; Instructor and Psychologist > Auxiliar Services; Instructor and Psychologist < Occupational Therapist. ***Positive affects:*** no effects. ***Negative affects:*** no effects.

Table 2. Correlations and descriptive statistics of study variables

	Empathy	Social support	Perceived stress	Relational stress	Positive affects	Negative affects
Empathy	1					
Social support	0.207**	1				
Perceived stress	-0.285**	-0.378**	1			
Relational stress	-.0119**	-0.079	0.267**	1		
Positive affects	0.184**	0.417**	-0.471**	0.001	1	
Negative affects	-0.177**	-0.267**	0.581**	0.291**	-0.410**	1
Mean	26.41	45.24	22.71	33.88	18.81	14.69
Standard Deviation	2.82	7.33	6.38	6.19	2.83	3.40
Range	16.00	42.00	32.00	34.00	15.00	24.00
Skewness (A)	-0.580	-1.21	0.249	0.540	-0.367	0.692
Kurtosis (K)	0.127	1.733	-0.248	0.361	0.393	1.78

$^{*}p \leq 0.05$; $^{**}p \leq 0.01$; $^{***}p \leq 0.001$

Mediation models between affective states and stress, with empathy and social support as mediating variables

Four mediation models were conducted to determine if cognitive empathy and social support mediated the relationship between positive and negative affects, and perceived and relational stress. Variables with the highest correlation were selected for these models.

Affects and perceived stress. In the mediation study between negative affects and perceived stress, negative affect negatively influenced empathy (ß = -0.16) and social support (ß = -0.49). In turn, empathy negatively affected social support (ß= -0.41) and perceived stress (ß = -0.29), and social support negatively affected perceived stress (ß = -0.18). Additionally, the direct effect of negative affects on perceived stress was positive (ß = 0.92), while the indirect effect through empathy and social support was positive but significantly lower (ß = 0.15). This mediation explained 33% of the variance in perceived stress. For positive affects and perceived stress, positive affect positively influenced empathy (ß = 0.16) and social support (ß = 1.05). Empathy positively affected social support (ß = 0.31) and negatively affected perceived stress (ß = -0.37), while social support negatively influenced perceived stress (ß= -0.16). The direct effect of positive affects on perceived stress was negative (ß = -0.77), with the indirect effect through empathy and social support also negative but significantly lower (ß= -0.24). This mediation explained 22% of the variance in perceived stress. The results are presented in Figure 1.

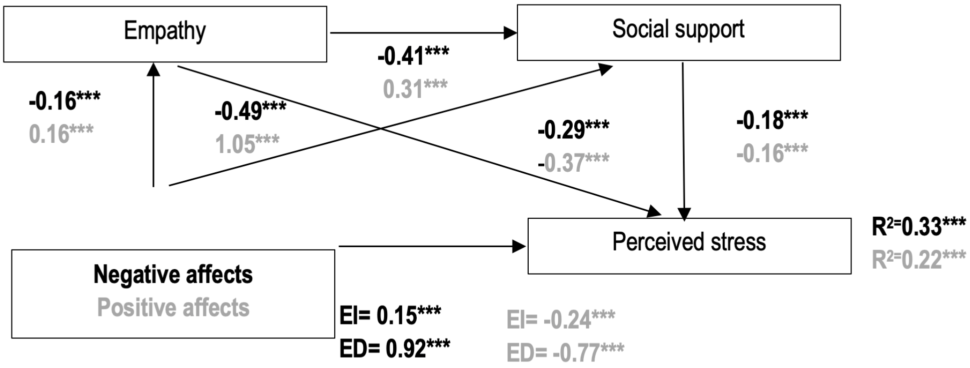

Figure 1. Mediation model for perceived stress

**p≤0.05; **p≤0.01; ***p≤0.00; Black color: values related to negative affect; Gray color: values related to positive affect*

Affects and relational stress. In the mediation study between negative affects and relational stress, negative affect negatively influenced empathy (ß = -0.15) and social support (ß = -0.54). Empathy positively affected social support (ß=0.48) and negatively affected relational stress (ß = -0.07), while social support had a non-significant positive effect on relational stress (ß = 0.02). The direct effect of negative affects on relational stress was positive (ß = 0.52), while the indirect effect through empathy and social support was negative and non-significant (ß = -0.008). This mediation explained 9% of the variance in perceived stress. For positive affects and relational stress, positive affect positively influenced empathy (ß=0.17) and social support (ß = 1.09). Empathy positively affected social support (ß = 0.34) and negatively influenced relational stress (ß= -0.18), while social support negatively influenced relational stress (ß = -0.06). The direct effect of positive affects on relational stress was positive (ß = 0.046), with the indirect effect through empathy and social support negative but non-significant (ß = -0.09). This mediation explained 0.06% of the variance in perceived stress. The results of these medications are shown in Figure 2.

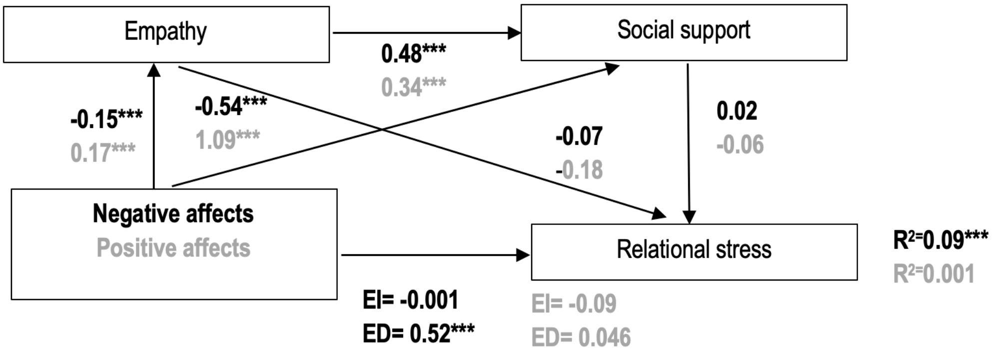

Figure 2. Mediation model for relational stress

**p≤0.05; **p≤0.01; ***p≤0.001; Black color: values related to negative affect; Gray color: values related to positive affect*

Discussion

The performance of professional tasks in caring for individuals with functional diversity entails a series of implications that can exacerbate psychological clinical issues related to high levels of stress. This experience of stress will be influenced by mediating variables,(18) making it crucial to detect and address them adaptively in caregiving contexts. For this reason, the aim of this research was to analyze how the affective states of professionals working as caregivers for individuals with functional diversity are related to the perceived stress and relational stress they experience, and how empathy and social support may mediate this relationship. Firstly, *hypothesis 1* suggested that positive affect would positively correlate with empathy and social support, while negative affect would positively correlate with perceived stress and relational stress. The results of this research are consistent with this hypothesis since positive affect significantly and positively correlated with social support and empathy in its cognitive dimension, and negatively with perceived stress, relational stress, and negative affect. Conversely, negative affect significantly and positively correlated with perceived stress and relational stress, and significantly negatively with positive affect, empathy, and social support.

These findings are in line with the scientific literature, which emphasizes the role of positive affect as a protective factor against high levels of perceived stress,(18) and the importance of a life linked to reliable sources of social support, an empathetic attitude, and low negative affect in reducing stress and the negative consequences of caregiving, as well as in promoting healthy personal development.(3,4,17,20) Secondly, *hypothesis 2* suggested that positive affect would be negatively related to elevated levels of perceived and relational stress, while negative affect would be positively associated with higher levels of perceived and relational stress. The results of the present research partially support this hypothesis, as positive affect had a significantly negative effect on perceived stress but had little effect on relational stress, which was not significant; meanwhile, negative affect had a significantly positive effect on perceived stress and relational stress. These data are consistent with those in the literature, explaining that negative affect and its characteristics are related to high levels of stress and burnout in professional caregivers,(27) while positive affect promotes better professional and social development and lower levels of stress,(21) as well as a greater interest and quality of care provided by professionals assisting individuals with functional diversity.(3)

Finally, *hypothesis 3* proposed that social support and empathy would mediate the relationship between affect and stress, reducing levels of perceived and relational stress. The results of our research partially supported this hypothesis. Firstly, it was observed that in the case of negative affects, cognitive empathy, and social support mediated the relationship with perceived stress, significantly reducing its levels. Regarding positive affects, empathy, and social support also significantly reduced the levels of perceived stress, although to a lesser extent than in the case of negative affects. In contrast, it was observed that, although for both negative and positive affects, empathy and social support reduced levels of relational stress, this reduction was not significant, so they did not influence the reduction of relational stress levels and did not act as mediating variables between this and affective states. In this regard, the results were consistent with the existing evidence in the literature, which explains that lack of social support is related to high levels of stress,(19) while having good social support and being an empathetic person act as protective factors against high levels of stress.(17,24-26) Additionally, these variables acted as protective factors in professionals who assist as caregivers for individuals with functional diversity, promoting positive self-esteem and greater satisfaction with their work.(3)

Although this study highlights the importance of mediating variables in regulating stress levels among professionals caring for individuals with functional diversity, it has some limitations. Firstly, it's a cross-sectional study, conducted at a single point in time, suggesting the need for future longitudinal research to explore these findings over a longer period. Additionally, participants were solely from centers in the Valencian Community in Spain, limiting generalizability. Therefore, expanding the sample to include different roles and replicating the study across various regions and countries would strengthen the conclusions. It should also be noted that the sample is not highly representative, so it would be important to increase the size and heterogeneity of the sample in order to obtain better results. In addition, the reliability of the instruments used is medium-low, so it would be advisable to use tests with higher reliability. Furthermore, the study only assessed empathy from its cognitive aspect, suggesting further exploration of its emotional dimension. Finally, there's a lack of distinction in the literature between perceived stress and relational stress, highlighting the need to clarify these variables.

While acknowledging the outlined limitations, this study underscores the significance of fostering empathy and cultivating robust social support networks among professional caregivers. These variables, in their mediating capacity, mitigate the diverse stressful situations and associated emotional distress encountered by these professionals. For this reason, it is important to promote strategies and actions in social care settings aimed at reducing the stress levels associated with caregiving, in addition to promoting personal adjustment in professionals and encouraging the presence of these protective mediating variables. In this sense, efforts should be made to establish a quality relationship between these professionals and users, promoting shared decision-making and a more humanized care approach, and nurturing personal growth and autonomy both in users and in the professional caregivers who assist them.

Conclusion. The aim of the present research was to analyse how the stress levels of professionals working in care for people with functional diversity are influenced by positive and negative affect, and how this relationship is mediated by the level of empathy and social support they present. Thus, the results of this research showed that positive affect correlated significantly positively with social support and empathy, and correlated negatively with high levels of perceived and relational stress. Conversely, negative affect correlated significantly positively with elevated levels of perceived stress and relational stress, while it correlated negatively with empathy and social support.

Furthermore, positive affect significantly influences the reduction of high levels of perceived stress, while its effect on relational stress is practically null. On the other hand, negative affect significantly influences the increase of perceived stress levels, and significantly influences the increase of relational stress levels, although in this case, the influence is smaller. Finally, it was observed that empathy and social support significantly mediated the relationship between affect and perceived stress, decreasing the levels of perceived stress, while the mediating effect of these variables between affect and relational stress was not significant, and therefore had little influence on the relationship between the two variables.

From a practical perspective, these findings highlight the need to implement continuous training programs for healthcare professionals that strengthen empathy and foster the development of social support networks. Enhancing these aspects can be crucial in reducing both perceived and relational stress, ultimately improving well-being and the quality of patient care. It is essential to consider the specific roles of different healthcare professionals, as their functions and responsibilities may shape their experiences of stress and social support. Although this study did not focus exclusively on nursing, the findings are highly relevant to this group, given the similarities in roles between nurses, nursing assistants, and other direct care professionals. Like their colleagues, nurses are exposed to emotionally demanding situations and interpersonal stressors, making them equally susceptible to the effects observed in this study. Therefore, promoting empathy, strengthening peer support networks, and addressing profession-specific challenges should be key priorities in healthcare training and organizational policies.

Funding: Contract for the development of a study between Caixa popular and the Universitat de Valencia. Estudi general. OTR2023-23797INVES

Data Availability Statement. The data that support the findings of this study are available from the corresponding author, [SVM], upon reasonable request.

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Pain manifestations in nursing professionals: a scoping review

Review

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Pain manifestations in nursing professionals: a scoping review

Abstract

Objective. To map the literature on the prevalence of pain in nursing professionals. **Methods.** This is a scoping review that was conducted according to the Joanna Briggs Institute (JBI) methodology for scoping reviews, and according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). The protocol was developed and registered in the Open Science Framework (OSF) [https://osf.io/2zu73/]. The search was carried out in the following databases: PubMed/MEDLINE, Virtual Health Library (VHL), Web of Science, Scientific Electronic Library Online (SciELO), SciVerse Scopus, Embase, and the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (CAPES). **Results.** A total of 49 studies were included, all of which were cross-sectional studies, and the total sample of the included studies was 35,069 participants. Most of the included studies were

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Conflicts of interest: None
Received: October 3rd, 2024.
Approved: February 27th, 2025.

How to cite this article: Oliveira SM, Ferreira LL, Silva TA, Frazão IS. Pain manifestations in nursing professionals: a scoping review. Investigación y Educación em Enfermería. 2025; 43(1):e13.

DOI: https://doi.org/10.17533/udea.iee.v43n1e13

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

concentrated in the Asian continent (71.4%). Among the selected studies, it was shown that the most affected area was the lumbar region (81.57%), followed by the neck (71.5%) and shoulder (31.57%) regions. **Conclusion.** According to the studies evaluated, the prevalence of occupational pain in nursing professionals was of musculoskeletal origin. The high prevalence of pain found reinforces the importance of monitoring the health of nursing workers.

Descriptors: pain; nursing professionals; occupational diseases.

Manifestaciones de dolor en los profesionales de enfermería: una revisión de alcance

Resumen

Objetivo. Mapear la literatura científica sobre la prevalencia del dolor en los profesionales de enfermería. **Métodos.** Se trata de una revisión de alcance que se llevó a cabo de acuerdo con las metodologías del Instituto Joanna Briggs y con la extensión de la guía PRISMA. El protocolo se elaboró y registró en el Open Science Framework (OSF) [https://osf.io/2zu73/]. La búsqueda se realizó en las siguientes bases de datos: PubMed/MEDLINE, Biblioteca Virtual de Salud (BVS), Web of Science, Scientific Electronic Library Online (SciELO), SciVerse Scopus, Embase y el Catálogo de Tesis y Disertaciones de la Coordinación para el Perfeccionamiento del Personal de Educación Superior (CAPES). **Resultados.** Se incluyeron 49 estudios, todos eran estudios transversales, incluyendo la muestra un total de 35069 participantes. La mayoría de los estudios incluidos se concentraban en el continente asiático (71.4%). Entre los estudios seleccionados, se encontró que la zona más afectada por el dolor era la región lumbar (81.57%), seguida de las regiones de cuello (71.5%) y hombros (31.57%). **Conclusión.** Según los estudios evaluados, la prevalencia de dolor ocupacional en los profesionales de enfermería fue de origen musculoesquelético. La elevada prevalencia de dolor encontrada refuerza la importancia de acompañar la salud de los trabajadores de enfermería.

Descriptores: dolor; enfermeras practicantes; enfermedades profesionales.

Manifestações de dor em profissionais de enfermagem: uma revisão de escopo

Resumo

Objetivo. Mapear a literatura acerca da prevalência de dor em profissionais de enfermagem. **Métodos:** Trata-se de uma revisão de escopo que foi conduzida de acordo com metodologia do Joanna Briggs Institute (JBI) para revisões de escopo, e de acordo com o *Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews* (PRISMA-ScR). O O protocolo foi elaborado e registrado no Open Science Framework (OSF) [https://osf.io/2zu73/]. A pesquisa foi realizada nas bases de dados: PubMed/MEDLINE, Biblioteca Virtual em Saúde (BVS), Web of Science, *Scientific Electronic Library Online* (SciELO), SciVerse Scopus, Embase e o Catálogo de Teses e Dissertações da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). **Resultados.** Foram incluídos 49 estudos, todos eram estudos transversais e a amostra total dos estudos incluídos foi de 35.069 participantes. Maior parte dos estudos incluídos se concentrou no continente asiático (71.4%). Dentre os estudos selecionados, demonstrou-se que a área mais afetada foi a região lombar (81.57%), seguidas pelas regiões do pescoço (71.5%) e ombro (31.57%). **Conclusão.** De acordo com os estudos avaliados, a prevalência de dor ocupacional nos profissionais de enfermagem foi de origem musculoesquelética. A alta prevalência de dor encontradas reforça a importância do acompanhamento da saúde dos trabalhadores de enfermagem.

Descritores: dor; profissionais de enfermagem; doenças profissionais

Introduction

Pain is defined by the International Association for the Study of Pain (IASP) as "an unpleasant sensory and emotional experience associated with, or similar to, that associated with actual or potential tissue damage." (1) It is one of the most common symptoms leading to medical care and impacts individuals' personal and financial lives.(2,3) Pain can be classified according to its time of evolution (acute or chronic), its site of origin (peripheral, central, visceral, and somatic), and its pathophysiological mechanism (neuropathic, nociplastic, and nociceptive).(3,4) When observed clinically, it is possible to identify that pain triggers a wide variety of motor adaptations, ranging from subtle motor compensations during the performance of tasks to the complete avoidance of painful movements and activities.(2)

Chronic pain (CP) is characterized by its persistence after three months of the typical recovery period from an injury, or by being associated with chronic pathological conditions, leading to continuous or recurrent pain.(4,5) Furthermore, CP is classified as a disease by the International Classification of Diseases – 11, entitled primary chronic pain (that is not explained by another chronic condition), there are also secondary chronic pains, which are related to other pathologies or conditions (CP related to cancer, neuropathic CP, secondary visceral CP, secondary musculoskeletal CP, secondary post-surgical/post-traumatic CP or secondary headache/orofacial CP).(5) CP is considered an important public health problem, with serious consequences for both the individual and society in personal, social and economic terms, and may also be associated with higher levels of physical and emotional stress. Furthermore, it has a higher prevalence in women between the ages of 45 and 65.(4,5) CP interferes with the ability to work, since it is one of the main causes of disability. A study conducted with North American citizens estimated that the costs of people with chronic pain were around US$560 billion per year in medical costs and lost productivity.(3) CP is the main cause of sick leave, absenteeism and low productivity in the workplace.(4)

Currently, there is a growing increase in the prevalence of work-related musculoskeletal disorders (WMSDs) in several countries, manifesting in different clinical forms and reaching epidemic proportions. In the United States, WMSDs are the main cause of pain, suffering and disability in the workplace.(6) WMSDs affect workers in various occupations, and this set of disorders affects muscles, tendons and nerves. The most common risk factors are poor posture and forced repetitive tasks; The presence of these disorders usually presents with insidious pain that, if left untreated, can lead to temporary or permanent incapacity for work.(7) Work-related pain is directly linked to the increased number of sick leaves and absenteeism, and is the leading cause of disability, socioeconomic problems and reduced quality of life in the adult population of developed countries. Workers in various occupations have their health affected by debilitating musculoskeletal pain and/or work-related injuries in the hospital environment; musculoskeletal diseases continue to be the leading cause of decline in the workforce.(7,8)

Nursing professionals, in particular, are at greater risk than other health professionals of experiencing work-related musculoskeletal injuries and disorders, including low back pain.(7,8) In nursing professionals, ergonomic factors, such as patient handling and other activities related to manual patient repositioning, have been identified as major risk factors for the presence of pain and injuries for these professionals, especially in the lumbar spine region.(9) Nursing staff constitute the largest group of workers in the hospital setting and are responsible for the majority of patients' care.(10) During their duties, nursing professionals have a high physical burden; the continuous and repetitive action of lifting and transferring patients, associated with physical limitations due to poor ergonomics of hospital equipment, results in greater physiological stress for these professionals.(8,9)

The presence of disabling pain in this population requires attention, since nursing professionals are indispensable for the provision of quality health care and are present at all levels of health care. According to the Federal Nursing Council (COFEN), it is estimated that this category is responsible for approximately 90% of the care processes carried out in the health area, as well as for 60 to 80% of all actions in Primary Health Care.(11) Disabling pain can lead to an increase in sick leave and absenteeism among these professionals, causing a workforce deficit to provide health care to patients. A preliminary search was carried out in the following databases: PROSPERO, PubMed, Cochrane Database of Systematic Reviews and Open Science Framework and no published or ongoing scoping and systematic reviews were found that address the prevalence of pain manifestations in nursing professionals. Based on this assumption, it was observed that there is a need for an overview of the prevalence of pain in nursing professionals. That said, this review aims to map the literature on the prevalence of pain in nursing professionals.

Methods

This scoping review was conducted according to the Joanna Briggs Institute (JBI) methodology for scoping reviews,(12) and according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)(13) for preparing the review report. The protocol for this review was developed and registered in the Open Science Framework (OSF) [https://osf.io/2zu73/]. The guiding question for this review was developed based on the mnemonic PCC, Population (nursing professionals), Concept (pain) and Context (work environment). Thus, this scoping review aims to answer the research question: What is the prevalence of pain in nursing professionals?

Eligibility criteria

The inclusion criteria were established based on the elements of the guiding question, according to the PCC mnemonic, as detailed below: (P) - Population: studies that assessed the prevalence of pain in nursing professionals, whether nursing technicians, nursing assistants or nurses; (C) - Concept: manifestations of pain presented by nursing professionals; and (C) - Context: work environment. In view of the above, studies were included regardless of the year of publication and in all languages, with a view to developing a complete review with relevant quality. The following were excluded: studies that did not fit the research theme, studies that assessed other health professionals, qualitative studies, review studies, reports, protocols, letters, comments and conference proceedings.

Search strategy

The search strategy aimed to locate published and unpublished studies. As recommended by the

JBI (REF), the search process was carried out in 3 phases in the development of a comprehensive research strategy.

First phase: conducting an initial limited search in a selected database, with the aim of finding articles related to the topic of interest. In this first stage, the PubMed database was chosen. In this initial search, the following descriptors and Boolean operators were used: pain AND nurses AND occupational diseases. Based on the initial result (n=700), the titles, abstracts and index terms used to describe and categorize them were read. When observing that the initial strategy presented high sensitivity and many of the studies did not meet the inclusion criteria, the necessary adjustments were made to perform a new search in the same database, using the descriptors: Nurse, Occupational Disease, Musculoskeletal Disease, Ache, Physical Suffering. The result of the new search was 272 articles. The titles and abstracts of the first 20 articles were read to determine whether they would be relevant to the guiding question of the review. After observing that the new strategy proved to be more appropriate, adaptations were made for the other databases. The final search strategies are detailed in Table 1, with the respective adaptations for each of them.

Table 1. Search strategies

Database	Search strategy	Result
PubMed	((((nurse) AND (occupational disease)) AND (Musculoskeletal Disease)) AND (ache)) AND (Physical Suffering)	272
BVS	(nurses) AND (pain) AND (occupational disease) AND (Physical Suffering)	83
Web of Science	((ALL=(nurse)) AND ALL=(pain)) AND ALL=(occupational disease)	264
SciELO	(pain) AND (nurses) AND (occupational diseases)	11
Scopus	(TITLE-ABS-KEY (nurse) AND TITLE-ABS-KEY (occupational AND disease) AND TITLE-ABS-KEY (musculoskeletal AND disease) AND TITLE-ABS-KEY (pain))	333
Embase	('nurse'/exp OR nurse) AND 'occupational disease' AND 'musculoskeletal disease' AND pain	64
CAPES Theses and Dissertations Catalogue	(nurse) AND (pain) OR (Physical Suffering) AND (occupational disease)	15

Second phase: it involves conducting targeted researches in each of the selected databases and information sources, as previously defined in the protocol. The following databases were investigated: PubMed/MEDLINE, Virtual Health Library (VHL), Web of Science, Scientific Electronic Library Online (SciELO), SciVerse Scopus, Embase and the Catalog of Theses and Dissertations of the Coordination for the Improvement of Higher Education Personnel (CAPES).

Third phase: scanning the reference lists of the selected studies for critical evaluation, in order to identify any additional relevant research.

Study selection

After the search, all identified citations were imported into the bibliography management software EndNote Web® and duplicate studies were removed. The remaining articles were imported into Rayyan Systems Inc. (Qatar Computing Research Institute, Doha, Qatar).(15,16) After a pilot test, two independent reviewers screened the titles and abstracts according to the eligibility criteria for the review. Potentially relevant studies were retrieved in full and their citation details were imported into Rayyan Systems Inc. Any discrepancies were resolved by a third reviewer. The analysis of gray literature resulting from dissertations or theses occurred without the aid of automated tools. Two independent researchers performed the analysis of the titles and abstracts directly in the CAPES Dissertation and Theses Catalog. When necessary, the authors or coordinators of the graduate programs were contacted to request the full studies. Dissertations or theses that met the eligibility criteria were evaluated in full. The reasons for exclusion of articles, dissertations or theses after reading the full text were described in the PRISMA-ScR flowchart.(13)

Data extraction

Data were collected using the instrument suggested by the JBI.(12) Subsequently, these data were standardized and organized in an electronic spreadsheet that included information on the title, authors, year of publication, type of study, number of participants, study location and prevalence of pain presented by nursing professionals.

Results

A total of 1042 studies were identified in the databases, of which 359 were duplicates, totaling 683. After analysis, 490 studies that did not meet the selection criteria were excluded. 193 studies were eligible, and after reading them in full, 144 studies were excluded. Thus, 49 studies were selected for this review. The results of the search and the study inclusion process are described in the PRISMA-SCR flowchart (Figure 1). The studies were published from 1996 to 2023. All were cross-sectional studies and the total sample of nursing professionals included was 35,069. Most of the included studies were concentrated in the Asian continent (71.4%) (18-26,29,33,35,36,38,39,42,44-49,51,52-58,60-64) followed by the European (14.2%) (30-32,34,37,40,50) American (8.1%) (28,41,43,65) and African (6.1%) (17,27,59) continents, with a predominance of publications in the last ten years (Table 2).

Figure 1. Flowchart of study selection according to PRISMA-SCR.

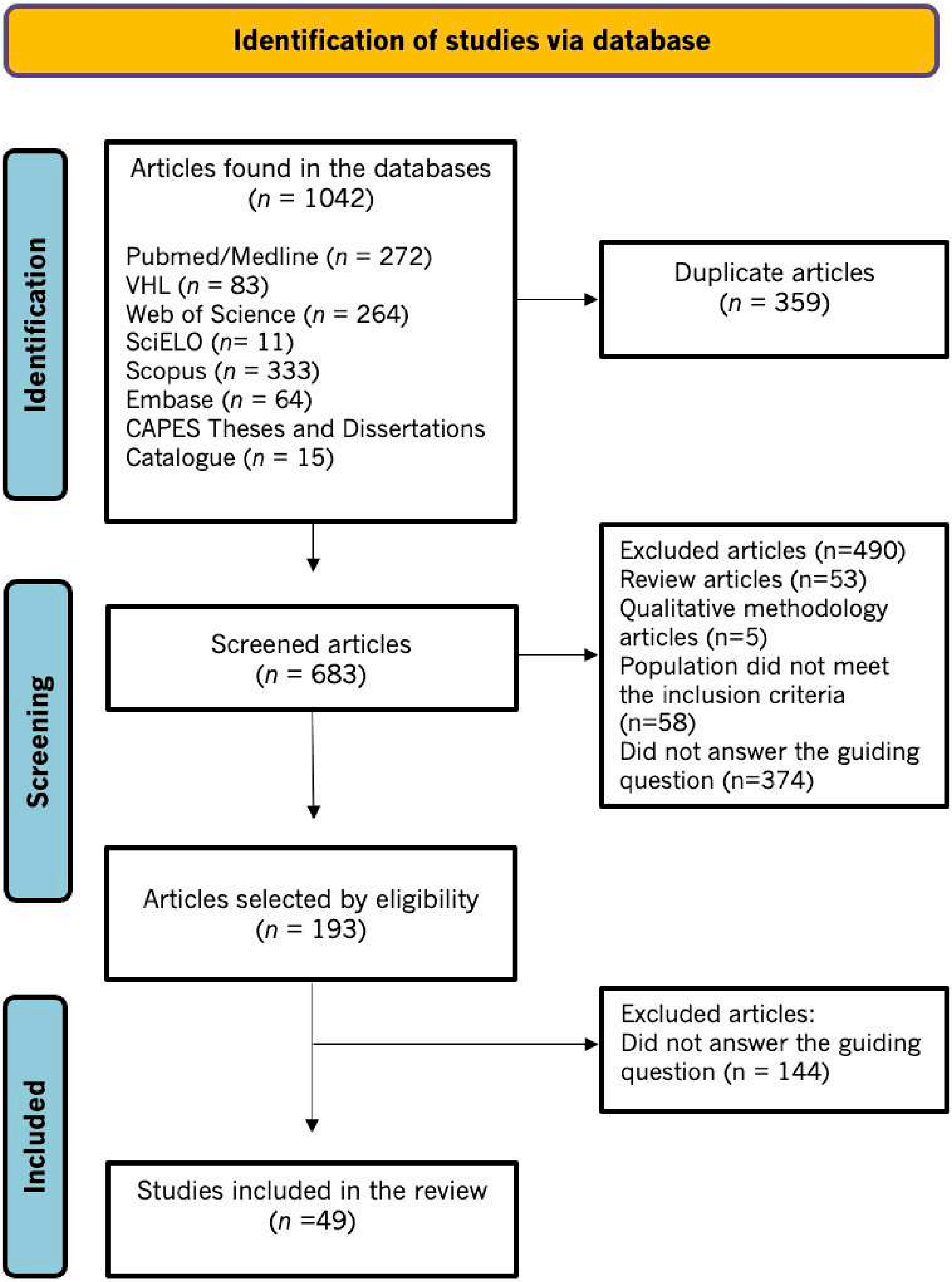

Table 2. Characteristics of included studies by author, year of publication and results

Author, year of publication, country and sample	Results			
Akodu *et al*., 2019(17) Nigeria, *n*= 135	Prevalence of WMSD in 12 months:			
	• Low back region: 43.2% • Knees: 9.9% • Shoulders: 9.9%	• Thoracic region: 9.9% • Neck: 8.6% • Elbows: 6.1%	• Ankles: 3.7% • Hips/thighs: 4.9%	• Wrist: 2.5% • Fingers: 1.2%
Almaghrabi *et al*., 2021(18) Saudi Arabia, *n*=234	82.9% of nurses complained of low back pain.			
	• 0 day: 14.4% • 1 to 7 days: 50%	• 8-30 days: 8.2%	• >30 days: 19.6%	• Daily: 7.7%
Almhdawi *et al*., 2020(19) Jordan, *n*= 597	Prevalence of WMSD in the lower quadrant in 12 months:			
	• Low back region: 77.4%	• Knee: 37.5%	• Ankle/foot: 28.5%	• Hips/thighs: 22.3%
Amin *et al*., 2014 (20) Malaysia *n*= 376	Prevalence of WMSD in 12 months by body region:			
	• Neck: 48.94% • Shoulder: 36.94% • Low back region: 35.28%	• Thoracic region: 40.69% • Arms: 6.63% • Wrists: 26.33%	• Thighs: 19.36% • Knees: 25.55%	• Feet: 47.2% • At least 1 region: 73.2%
Ando *et al*., 2000(21) Japan, *n*= 314	Prevalence of pain in the last month:			
	• Low back region: 57.7%	• Shoulder: 42.8%	• Neck: 31.3%	• Arm: 18.6%
Attar *et al*., 2014(22) Saudi Arabia, *n*= 200	The overall 12-month prevalence of self-reported WMSD was 85%.			
	• Low back region: 65.7% • Ankle/foot: 41.5% • Wrist/hand: 10%	• Shoulder: 29% • Knee: 21%	• Neck: 20% • Hips/thighs: 16.5%	•Mid back: 5% •Elbow: 3%
Barzideh *et al*., 2014(23) Iran, *n*= 385	Regions of musculoskeletal symptoms in the last 12 months:			
	• Low back region: 61.8% • Legs/feet: 59.7%	• Knees: 54.8% • Thoracic region: 54%	• Neck: 48.6% • Wrists/hands: 48.1%	• Shoulders: 45.5% • Thighs: 29.1%
Chandralekha *et al*., 2022(24) India, *n*= 207	The prevalence of WMSD among those in the last 12 months was 81.2%			
	• Low back region: 55.1% • Neck: 43.5%	• Shoulders: 43%	• More than one region: 38.2%	• More than 6 regions: 18.8%
Cheung *et al*., 2005(25) China, *n*= 406	The overall prevalence of back pain was 71.2%.			
	• Neck: 62.9% • Shoulders: 73.1% • Back: 71.2%	• Thoracic region: 61.2% • Low back region: 55.9% • Knees: 65.1%	• Ankles/feet: 53.4% • Wrists/hands: 30.3%	• Hips or thighs: 27.7% • Elbows: 17.3%
Cheung *et al*.,2018(26) China, *n*= 440	Prevalence of WMSD symptoms at the time of the survey:			
	• At least 1 region: 88.4% • Shoulders: 53% • Low back region: 41.4%	• Knees: 37.5 % • Ankles/feet: 28.2 % • Elbows/forearms 27.5%	• Wrists/hands: 25.8% • Fingers 25.7% • Neck: 24.8%	• Calf: 17.7% • Hips/thighs: 11.6% • Thoracic region: 6.4%

Table 2. Characteristics of included studies by author, year of publication and results (Cont)

Author, year of publication, country and sample	Results			
Chiwaridzo *et al*., 2018[27] Zimbabwe, *n*= 117	82.1% reported WMSD in the last 12 months.			
	• Back (lower and upper): 84.3%	• Low back region: 67.9%		
Daraiseh *et al*., 2010[28] USA, *n*= 263	Musculoskeletal symptoms at 1 month were more prevalent in the following regions:			
	• Low back region: 74.1%	• Neck: 55.2%	• Ankle/foot: 52.5%	• Shoulders: 50%
Dhas *et al*., 2023[29], Qatar n= 127	Presence of pain reported by region of the body:			
	• Low back region: 55.2% • Neck: 35.5% • Shoulder: 33.9%	• Thoracic region: 29.2% • Wrist/hand: 17.4%	• Ankle/foot: 15.8% • Knee: 15%	• Hips/thighs: 11.9% • Elbow: 7.9%
Engels *et al*., 1996[30] The Netherlands, *n*= 846	Complaints of pain by body region:			
	• Thoracic region: 7.9% • Low back region: 33.8% • Arm/Neck: 30.4%	• Neck: 22.9% • Shoulder: 19.5% • Elbow: 2.3%	• Wrist/hand: 5.7% • Leg: 15.7% • Hips/thighs: 6.9%	• Knee: 10.2% • Ankle/foot: 3.7%
Eriksen *et al*., 2003[31] Norway, *n*= 6.485	Prevalence of musculoskeletal pain during the last 14 days:			
	• Head: 41.9% • Neck: 53.5% • Shoulder: 47.1%	• Elbow: 11.7% • Wrist/hand: 20.8% • Thoracic region: 27.3%	• Low back region: 54.9% • Hips/thighs: 26.6% • Knee: 20.5%	• Ankle/foot: 15.5% • Any region: 88.8% • Generalized pain: 26.6%
Freimann *et al*., 2016[32] Estonia, n= 409	Prevalence of musculoskeletal pain in the last year and in the last month:			
	• Low back region: 56.9% • Neck: 55.7%	• Shoulder: 30.9% • Elbow: 12.4%	• Wrist/hand: 20% • Knee: 31.2%	• Any region: 70%
Gaowgzeh, 2019[33] Saudi Arabia, *n*= 60	61.7% of nurses had low back pain.			
	• Strong: 9.5%	• Moderate: 42.9%	• Mild: 47.6%	
Gilchrist *et al*., 2021[34] Czech Republic, *n*=569	• 84.7% of participants reported low back pain during the previous 12-month period • 76.6% of participants reported low back pain during the previous month			
Karki *et al*., 2023[35] Nepal, *n*= 165	Prevalence of MSD in the last 12 months:			
	• Neck: 60% • Shoulders: 45.5% • Elbows: 7.3%	• Wrists/hands: 43% • Thoracic region: 51.5%	• Low back region: 75.8% • Hips/thighs: 35.2%	• Knees: 38.8% • Ankles/feet: 37%
Khan *et al*, 2019[36] Pakistan, *n*= 254	- 185 nurses presented low back pain • 33.46% for more than 10 years • 23.23% for 6 to 10 years • 15.35% for 1 to 5 years. • 0.79% for less than 1 year.	- Among those who worked 6 to 7 hours: • 5.11% had mild pain • 12.6% had moderate pain • 10.63% had moderate pain	- Among those who worked 7 to 8 hours: • 9.06% had mild pain • 23.23% had moderate pain • 12.2% had moderate pain	
Knibbe *et al*., 1996[37] The Netherlands, *n*= 355	Prevalence of back pain:			
	• Last 12 months: 66.8%	• Last 3 months: 51.8%	• Last 7 days: 20.6%	

Table 2. Characteristics of included studies by author, year of publication and results (Cont)

Author, year of publication, country and sample	Results			
Koğa *et al*., 2019(38) Türkiye, *n*= 253	• 62.8% of nurses reported a family history of low back pain. • Lifetime prevalence of severe low back pain: 28.2% • Lifetime prevalence of ongoing low back pain: 21.1%			
Krishnan *et al*., 2021(39) Malaysia, *n*= 300	Complaints of musculoskeletal pain or discomfort reported by nurses over a 12-month period:			
	• Low back: 86.7%; • Ankle/feet: 86.7%; • Neck: 86%;	• Shoulders: 85.3%; • MMI: 85%; • Cervical spine: 84.3%;	• Knees: 77.3%; • Femoral region: 73.7%; • Hip (66.3%);	• Wrist/hand: 63%; • Forearm: 61.7%; • Elbow: 55%;
Latina *et al*., 2020(40) Italy, *n*= 280	Reports of pain in the last 12 months:			
	• Low back region: 83.4% • Neck: 71.3% • Shoulders: 64.5%	• Back: 59.6% • Wrist: 43.9%	• Knees: 41.9% • Hips/thighs: 39.6%	• Ankles: 29.4% • Elbows: 24.2%
Machado *et al*., 2014(41) Brazil, *n*= 309	Low back pain was the most frequent health problem reported by professionals (52.8%).			
Mehrdad *et al*., 2010(42) Iran, *n*= 317	Musculoskeletal symptoms in the last 12 months:			
	• Low back region: 73.2% • Neck: 46.3% • Shoulders: 48.6%	• Elbows: 16.6% • Thoracic region: 43.5%	• Wrists/hands: 42.2% • Ankles/feet: 39.3%	• Hips/Thighs: 28.8% • Knees: 68.7%
Moreira *et al*., 2014(43) Brazil, *n*= 258	Musculoskeletal symptoms in the last 12 months:			
	• At least 1 region: 93.5% • Cervical spine: 47.8% • Thoracic spine: 50.8% • Lower back spine: 57.1%	• Spine: 76.3% • Shoulder: 52% • Elbow: 7.8%	• Hip/thigh: 32.7% • Wrist/hand: 31.8% • Upper limb: 62%	• Knee: 31.8% • Ankle/foot: 40.4% • Lower limb: 65.3%
Nasaif *et al*., 2023(44) Bahrain, *n*= 550	The prevalence of musculoskeletal complaints in the last 12 months was 88.1%.			
	• Low back region:72.3%	• Shoulders: 52.8%	• Neck: 49.0%	• Elbow: 12.1%
Nguyen *et al*., 2020(45) Vietnam, *n*= 1.179	Prevalence of musculoskeletal symptoms during the last 12 months:			
	• Neck: M: 36.2% / W: 45.2% • Shoulder/arm: M: 22.2% / W: 30.6% • Elbow/forearm: M: 5.9% / W:30.6%	• Wrist/hand: M: 8.1% / W: 18.4% • Cervical spine: M: 24% / W: 33.4% • Lower back spine: M:28.5% / W: 47.9%	• Hip/thigh: M: 3.2% / W: 6.5% • Knee/leg: M: 14% / W: 21.4% • Ankle/foot: M: 16% / W: 8.8%	
Nourollahi *et al*., 2018(46) Iran, *n*= 80	Prevalence of WMSD in the body regions of hospital nurses:			
	• Low back region: 72% • Knees: 62% • Cervical spine: 57%	• Legs: 61% • Hands/wrist: 55%	• Neck: 46% • Shoulders: 42%	• Elbows: 30% • Hips: 21%
Pinnar, 2010(47) Türkiye, *n*= 2.400	Prevalence of WRMD in 12 months by body regions			
	• Low back region: 49.7% • Cervical region: 19.2%	• Neck: 35% • Shoulders: 38%	•Back/neck/shoulders: 13.7% •Legs: 30%	• Any region: 79.5%

Table 2. Characteristics of included studies by author, year of publication and results (Cont)

Author, year of publication, country and sample	Results			
Samaei *et al*., 2017(48) Iran, *n*=243	The prevalence of low back pain among 243 nursing professionals in Iran in the last 12 months was 69.5%.			
Senthilkumar *et al*., 2019(49) India, *n*= 100	Prevalence of pain in body parts:			
	ICU Nurses: • Neck: 57.6% • Shoulders: 44% • Back: 40.2% • Legs: 30.1%		*General ward nurses*: • Neck: 42.1% • Shoulders: 35.6% • Back: 30.6% • Legs: 25.4%	
Serranheira *et al*., 2012(50) Portugal, *n*= 2.140	- Prevalence of pain symptoms in the last 12 months: • Low back region: 60.6% • Neck: 48.6% • Thoracic region: 44.5%		- Prevalence of pain symptoms in the last 7 days: • Low back region: 29.5% • Neck: 25.8% • Thoracic region: 21.1%	
Sezgin *et al*., 2015(51) Türkiye, *n*= 1.515	The prevalence of MSD by body regions:			
	• Legs: 64.4% • Low back region: 58.8% • Back: 44.6%	• Shoulders: 33.7% • Neck: 30.3%	• Feet: 14.9% • Arms: 14.6%	• Fist: 9.6% • Head: 7.4%
Sharma *et al*., 2022(52) India, *n*= 260	The prevalence of WMSD in the last 12 months among Indian nurses was 80%			
	• Neck: 36% • Shoulders: 32%	• Elbow: 5% • Wrists/hands: 10%	• Back: 52% • Hip: 25%	• Knee: 28% • Ankles/Feet: 46%
	Frequency of pain:	• Regular: 50%	• Occasionally: 25%	• Never: 25/%
Shieh *et al*., 2016(53) China, *n*= 788	72% of study participants reported having low back pain.			
Smith *et al*., 2003(54) Japan, *n*= 305	Prevalence of MSD:			
	• Low back region: 59% • Neck: 27.9% • Shoulders: 46.6% • Thoracic region: 10.2%	• Arms: 2.6% • Elbows: 2% • Forearms: 1.6%	• Wrists: 4.3% • Thighs: 11.8% • Knees: 16.4%	• Legs: 8.5% • Ankles: 7.5% • Any region: 78.4%
Smith *et al*., 2004(55) China, *n*= 282	Prevalence of musculoskeletal complaints in the last 12 months:			
	• Any region: 70% • Low back region: 56%	• Neck: 45%	• Shoulder: 40%	• Thoracic region: 37%
Smith *et al*., 2004(56) China, *n*= 206	MSD prevalence in the 12-month period:			
	• Low back region: 56.7% • Neck: 42.8% • Thoracic spine: 38.9%	• Shoulder: 38.9% • Elbows: 10% • Knees: 31.1%	• Wrists: 27.8% • Legs: 22.8%	• Ankle/feet: 34.4% • Any region: 70%
Smith *et al*., 2005(57) Korea, *n*= 330	Prevalence of musculoskeletal symptoms:			
	• Neck: 62.7% • Shoulders: 74.5% • Thoracic region: 29.7%	• Elbow: 6.4% • Forearm: 9.7% • Wrists/hands: 46.7%	• Low back region: 72.4% • Thighs: 14.2% • Knees: 35.2%	• Legs: 52.1% • Feet: 38.8% • Any region: 93.6%

Table 2. Characteristics of included studies by author, year of publication and results (Cont)

Author, year of publication, country and sample	Results			
Tang *et al*.,2022(58) China, *n*= 651	Twelve-month prevalence of SCI:			
	• Low back region: 73.5% • Neck: 73.2% • Shoulders: 66.2%	• Thoracic region: 56.3% • Thighs/hips: 38.9%	• Elbows: 29.5% • Wrists/hands: 42.6%	• Knees: 42.3% • Ankles/feet: 42.5%
Tinubu *et al*., 2010(59) Nigeria, *n*= 128	Prevalence of musculoskeletal disorders:			
	• Low back region: 44.1% • Neck: 28% • Knees: 22.4%	• Thoracic region: 16.8% • Wrists/hands: 16.2%	• Shoulders: 12.6% • Ankles/feet: 10.2%	• Elbows: 7.1% • Hips/thighs: 3.4%
Tojo *et al*.,2018(60) Japan, *n*= 640	The prevalence of foot and ankle pain in the last month was 23% (SNQ) and 51% (MFPDI).			
	• Hallux: 14% • Little toe: 14% • Plantar forefoot: 9%	• Medial arch: 9% • Midfoot: 16%	• Ankle: 10% • Heel: 6%	• Heel back: 7% • Overall: 23%
Yan *et al*., 2017(61) China, *n*= 6674	- Prevalence of WMSD in the last 12 months:			
	• Neck: 59.77% • Shoulder: 49.66% • Back: 39.5%	• Elbow: 14.49% • Low back: 62.71% • Wrists: 21.7%	• Hip: 20.41% • Knee: 33.35% • Ankle: 29.86%	• 1 body region: 77.43% • 2 body regions: 68%
Yang *et al*., 2019(62) China, *n*= 679	Prevalence of pain by body region in the last 12 months:			
	• Low back region: 80.1% • Neck: 78.6% • Shoulder: 70.4%	• Thoracic spine: 39.3% • Elbow: 15.8% • Wrist/hand: 38.9%	• Hip/thigh: 29.9% • Knee: 37.4%	• Ankle/foot: 31.5% • Overall WMSD: 97.1%
Yao *et al*., 2019(63) China, *n*= 692	Prevalence of WMSD in the last 12 months:			
	• Elbow: 17.3% • Hip: 23.8% • Knee: 34.5%	• Hands/wrists: 30.1% • Ankle/foot: 30.6% • Neck: 68.2%	• Back: 39.7% • Shoulder: 54.6%	• Waist: 67.6% • Any region: 84%
Yilmaz *et al*., 2022(64) Türkiye, *n*= 169	Pain regions:			
	• Low back region: 68% • Neck: 52.1% • Back: 68%	• Shoulder: 46% • Elbow: 10.7%	• Hands/wrists: 29.6% • Hips/thighs: 28.4%	• Knees: 37.3% • Foot/ankle: 41.4%
Zhang et *al*., 2020(65) USA, *n*= 327	Reports of pain in the following areas of the body:			
	• Low back region: 63% • Neck: 50.6%	• Shoulder: 42.4% • Knee: 35%	• Fist/forearm: 24.2%	• Ankle/foot: 39.3%.

Legend: MSD – Musculoskeletal disorders; WMSD – Work-related musculoskeletal disorders; RSI – Repetitive strain injury; SCI – Musculoskeletal injuries; ADL – Activities of daily living; SNQ – Standardized Nordic Questionnaire; MFPDI – Manchester Foot Pain and Disability Index.

Discussion

This scoping review mapped the literature on the prevalence of pain in nursing professionals. Among the selected studies that evaluated multiple regions of the body (38 studies),(17,19-26,28-32, 35,39,40,42-47,49-52,54-59,61-65) the majority demonstrated that the most affected area was the low back region (81.57%), followed by the neck (71.5%) and shoulder (31.57%) regions. Eight studies evaluated only the prevalence of low back pain,(18,33,34,36,38,41,48,53) two of back pain(27,37) and one only pain in the foot and ankle region.(60) The incidence of low back pain among hospital nursing professionals is considerably high, being the main reason for sick leave in this professional segment.(76) High physical or mechanical demands strain and fatigue the muscles, which can trigger low back pain due to prolonged positions and repetitive movements.(73) Low back pain is recognized as a significant occupational risk in most countries, causing long-term impacts on the health of nurses, compromising their work performance and job stability, and having an overall impact on the quality of care provided to patients.(74) In addition, nurses who have had low back pain and continue to work are at greater risk of experiencing situations that aggravate their low back pain.(75)

In all included studies, the pain was of musculoskeletal origin. Musculoskeletal disorders (MSDs) represent a major health concern, being internationally recognized as the second leading cause of physical disability.(66) MSDs represent a significant problem for nursing professionals, since they directly impact quality of life, increase absenteeism and restriction of work functions, in addition to the considerable financial cost for individuals and organizations.(59) Some studies have concluded that the high prevalence of pain in various regions of the body was associated with psychosocial factors, especially stress, suggesting that the interactions of psychosocial factors and physical exhaustion potentially increased the risk of musculoskeletal pain in nursing professionals.(20,42,55) In addition, another study indicated that high psychological and physical demands at work were associated with an increase in back injuries.(23)

Musculoskeletal pain symptoms have also been associated with organizational factors, such as type of hospital, frequent schedule changes, type of shift work, patient handling, and working conditions,(21,49,51) similarly, high physical workload is associated with increased low back pain in hospital nurses, along with longer working hours and many hours standing with constant commuting.(18,22,25,26,53,59) High workloads and stress have been associated not only with pain but also with the risk of injuries. In the study by Clark[67] *et al*., it was observed that high work demands were related to an increased likelihood of needlestick injuries and near misses among hospital nurses.(67) Musculoskeletal pain in nurses is a result of work demands and physical exhaustion resulting from the professional activities performed, mainly affecting the low back, thoracic, and cervical regions.(68-70)

In the study by Tojo *et al*.,(60) where the prevalence of pain in the foot and ankle region was investigated, a pain prevalence rate in the last month of 23% was found using the standardized Nordic questionnaire and 51% using the Manchester Foot Pain and Disability Index. Other studies included also provided data on prevalence in the foot and ankle region, where in four of them, the prevalence rate was greater than 50%.(23,25,28,39) Several conditions can generate chronic pain in the feet and ankle, however, the pain is mainly caused by inadequate footwear.(71) Another important factor is work activities, since nurses spend most of their working time standing, they can develop several conditions resulting from the use of inadequate footwear, which can cause pain in the feet and ankles, such as plantar fasciitis, bunions and hammertoes.(72)

Work-related musculoskeletal disorders in nursing staff arise from direct activities with patients, such as bed baths, adjusting patients in bed, changing clothes, and transferring patients between beds and stretchers. This occurs when appropriate techniques are not used to deal with repetitive, monotonous, and physically demanding activities.(77) Additionally, rotating shifts and night work contribute to pain, fatigue, and illness among these professionals.(78)

The conclusion of this study is that the prevalence of pain in nursing professionals was of musculoskeletal origin, with the most affected areas being the low back, neck, and shoulder regions. Working conditions, long working hours, and the intense workload faced by nursing professionals are associated with the presence of pain, especially in the low back region. The high prevalence of pain found reinforces the importance of monitoring the health of nursing workers, as well as the need for occupational changes, preventive actions and health education, since the presence of pain affects the well-being of the physical and occupational health of the nursing professional, which can compromise the quality of care and increase absenteeism at work.

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Original Article

Nursing Intervention "EducaTHE" to Improve Knowledge and Self-care Behaviors for Hypertensive Disorders in Pregnant Women: a Randomized Controlled Pilot Study

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Conflicts of interest: None
Received: September 11, 2024.
Approved: January 17, 2025.

How to cite this article: Ulloa IM, Arias EM. Nursing Intervention "EducaTHE" to Improve Knowledge and Self-care Behaviors for Hypertensive Disorders in Pregnant Women: a Randomized Controlled Pilot Study. Investigación y Educación en Enfermería. 2025; 43(1):e14

DOI: https://doi.org/10.17533/udea.iee.v43n1e14

Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Nursing Intervention “EducaTHE” to Improve Knowledge and Self-care Behaviors for Hypertensive Disorders in Pregnant Women: a Randomized Controlled Pilot Study

Abstract

Objective. This work sought to determine the feasibility, acceptability, and potential effect of the nursing intervention “Knowledge and self-care behaviors of pregnant women in the face of hypertensive disorders of pregnancy - EducaTHE”. **Methods.** This study is a pilot randomized controlled trial. Sixty pregnant women who were enrolled in the antenatal care program of a health institution participated. They were selected via simple random sampling and assigned to the experimental group ($n = 30$) and control group ($n = 30$). The intervention consisted of four educational sessions once a week, while the control group received usual antenatal care. Recruitment, follow-up, and dropout rates were assessed, as well as participant satisfaction. Both groups completed the “Knowledge and Self-Care Behaviors - CoNOCiTHE” and “Determinants of Behavior” scales before and four weeks after the intervention to assess impact. **Results.** The recruitment rate was 75.94%, 90% at follow-up and 10% dropouts. Overall satisfaction was 4.82 out of 5. The effect of the intervention showed a significant increase in the level of knowledge and behaviors in the experimental group compared to the control group (77 vs. 69; $p< 0.001$) and in the determinants of behavior (159 vs. 154; $p=0.066$), and a large effect size (d-Cliff = 0.7517). These changes were not significant in the control group ($p\geq0.05$). **Conclusion.** This study shows the feasibility and acceptability of the intervention in the maternal population, as well as the potential effect of improving knowledge and self-care behaviors in the face of hypertensive disorders of pregnancy. Therefore, it is recommended to use these types of educational interventions in maternal and perinatal nursing care.

Descriptors: randomized controlled trial; nursing; hypertension, pregnancy-induced; self-care; behavior; theory of planned behavior.

Intervención de enfermería “EducaTHE” para mejorar el conocimiento y los comportamientos de autocuidado ante los trastornos hipertensivos en mujeres embarazadas: un estudio piloto controlado aleatorizado

Resumen

Objetivo. Determinar la factibilidad, aceptabilidad y efecto potencial de la intervención de enfermería “Conocimientos y comportamientos de autocuidado de la mujer embarazada ante los trastornos hipertensivos del embarazo - EducaTHE”. **Métodos.** Este es un estudio piloto controlado aleatorizado. Participaron sesenta mujeres embarazadas inscritas en el programa de atención prenatal de una institución de salud, seleccionadas por muestreo aleatorio simple y asignadas al grupo experimental ($n = 30$) y grupo control ($n = 30$). La intervención consistió en cuatro sesiones educativas una vez por semana, mientras el grupo control recibió la atención prenatal habitual. Se evaluaron las tasas de reclutamiento, seguimiento y deserción, así como la satisfacción de las participantes. Ambos grupos diligenciaron las escalas “Conocimientos y comportamientos de autocuidado – CoNOCiTHE” y “Determinantes del comportamiento” antes y cuatro semanas después de la intervención para evaluar el impacto. **Resultados.** La tasa de reclutamiento fue del 75.94 %, 90 % en el seguimiento y deserción del 10 %. La satisfacción global fue de 4.82 sobre 5. El efecto de la intervención evidenció un aumento significativo en el nivel de conocimientos y comportamientos en el grupo experimental en comparación con el grupo control (69 vs. 77; $p<0.001$) y en los determinantes del comportamiento (154 vs. 159; $p=0.066$), y un tamaño de efecto grande (d-Cliff = 0.7517). Conclusión. Este estudio evidencia la factibilidad y aceptabilidad de una intervención de enfermería en la población materna, y el efecto potencial de mejorar los conocimientos y comportamientos de autocuidado ante los trastornos hipertensivos del embarazo. Por lo que se recomienda utilizar este tipo de intervenciones educativas en el cuidado de enfermería materno perinatal.

Descriptores: ensayo controlado aleatorizado; enfermería; hipertensión inducida en el embarazo; autocuidado; comportamiento; teoría del comportamiento planificado.

Intervenção de enfermagem “EducaTHE” para melhorar o conhecimento e os comportamentos de autocuidado frente aos transtornos hipertensivos em gestantes: Um estudo piloto controlado randomizado

Resumo

Objetivo. Determinar a viabilidade, aceitabilidade e potencial efeito da intervenção de enfermagem “Conhecimento e comportamentos de autocuidado de gestantes frente aos transtornos hipertensivos da gravidez - EducaTHE”. **Métodos.** Este é um estudo piloto controlado randomizado. Participaram sessenta gestantes cadastradas no programa de pré-natal de uma instituição de saúde, selecionadas por amostragem aleatória simples e distribuídas em grupo experimental ($n=30$) e grupo controle ($n=30$). A intervenção consistiu em quatro sessões educativas uma vez por semana, enquanto o grupo controle recebeu cuidado pré-natal habitual. Foram avaliadas as taxas de recrutamento, acompanhamento e abandono, bem como a satisfação dos participantes. Ambos os grupos diligenciaram as escalas “Conhecimentos e comportamentos de autocuidado – CoNOCiTHE” e “Determinantes do comportamento” antes e 4 semanas após a intervenção para avaliar o impacto. **Resultados.** A taxa de recrutamento foi de 75.94%, 90% em acompanhamento e 10% de abandono. A satisfação geral foi de 4.82 em 5. O efeito da intervenção mostrou um aumento significativo no nível de conhecimento e comportamentos no grupo experimental em comparação com o grupo controle (69 vs. 77; $p<0.001$) e nos determinantes do comportamento (154 vs. 159; $p=0.066$) e um grande tamanho de efeito (d-Cliff = 0.7517). **Conclusão.** Este estudo evidencia a viabilidade e aceitabilidade de uma intervenção de enfermagem na população materna, e o potencial efeito da melhoria do conhecimento e dos comportamentos de autocuidado diante dos transtornos hipertensivos da gravidez. Portanto, recomenda-se a utilização desse tipo de intervenção educativa na assistência de enfermagem materna e perinatal.

Descritores: ensaio clínico controlado aleatório; enfermagem; hipertensão induzida pela gravidez; autocuidado; comportamento; teoria do comportamento planejado.

Introduction

Hypertensive disorders of pregnancy (HDP) are the second leading cause of maternal mortality and one of the leading causes of perinatal morbidity worldwide.(1) Hypertensive disorders of pregnancy affect approximately 10% of all pregnancies and account for about 14% of maternal mortality globally.(1) In Latin America and the Caribbean, HDP account for 26% of maternal deaths; in Asia and Africa, these contribute to 9%, and 19.6% in Colombia.(2) Currently, it is clear that HDP is a multisystemic complication with multifactorial etiology.(3) Studies by Ouasmani *et al*.,(4) and Fadare *et al*.,(5) suggest that many of the complications associated with HDP are the result of negative attitudes and low knowledge about the disease, as well as the lack of care practices by pregnant women. In this sense, interventions aimed at preventing, detecting, or controlling risk must address a wide range of factors, such as improving knowledge, lifestyle modification, and multidisciplinary care.(3)

Health education is an essential component of women's care during the antenatal period.(6) One of the main objectives of health education is to improve pregnant women's knowledge, self-care behaviors, and health decision-making, which can lead to reducing morbidity and mortality, improving quality of life, and reducing health care costs.(7) However, lack of health education interventions during prenatal care, and specifically regarding HDP, may contribute not only to women's inadequate understanding of the disease and possible health complications, but also to delay in seeking care and poor results in maternal-fetal well-being.(4)

In this sense, research(8-10) has shown positive effects of interventions and educational programs in improving the knowledge, attitudes, and practices of self-care in women with or without HDP diagnosis. However, few studies in this field have validated the intervention,(11) its measurement instruments,(12-14) and educational materials,(13,14) or even the use of a theoretical reference.(15-17) In this regard, Sidani and Braden(18) have described that validating an intervention allows verifying the fidelity of its application to correctly interpret its results and for it to be transferred and reproduced in practice. Similarly, availability of instruments with proven validity and reliability enables a systematic, objective, and reliable assessment of health needs, guiding the adoption of strategies to meet said needs.(19) Furthermore, validation of health materials seeks to guarantee a material that is in consistent with the characteristics and needs of the population, and the objectives proposed in educational interventions.(20) Lastly, evidence has also described that interventions should be designed based on health education models and theories,(17) given that these can influence significantly the effectiveness of health education programs.(21) For example, studies aimed at strengthening self-care behaviors during the prenatal period have used the Theory of Planned Behavior (TPB),(22) a theoretical reference widely described in designing and evaluating educational interventions to achieve behavioral goals focused on improving the consumption of iron supplementation,(23) oral health,(24) promotion of breastfeeding,(25) prevention of urinary tract infections,(26) and self-care in women with HDP,(17) and gestational diabetes.(27) These studies suggest that a woman's motivation to engage in self-care behaviors during the antenatal period increases with her positive attitudes toward the behavior, her social and family support, and her awareness and control of her own resources, skills, and abilities.(17)

The aforementioned research shows the development of TPB and reveals how it has been one of the most applicable cognitive-social frameworks to study human action and predict and understand health behaviors, including self-care.(27) According to the review of the published literature, within the Colombian context, no studies were found that sought to prevent or control the risk of HDP in healthy pregnant women, nor were there any interventions that integrate a theoretical basis in their design and evaluation. Thus, a need arises to design an educational intervention that increases levels of knowledge in pregnant women and promotes self-care behaviors in the face of HDP. Therefore, the aim of this study was to determine the feasibility, acceptability, and potential effect of the nursing intervention "EducaTHE" to improve knowledge and self-care behaviors against hypertensive disorders in pregnant women.

Methods

This was a randomized controlled pilot trial study registered in ClinicalTrials.gov (NCT05837962). This study was conducted in 2023 during three months in a health institution in Piedecuesta, Santander, Colombia. This study included pregnant women aged ≥ 18 years, enrolled in the prenatal control program, gestational age ≤ 24 weeks – as determined by the date of the last menstrual period or obstetric ultrasound, and living in the urban area. The study excluded pregnant women with cardiovascular, renal, or diabetes mellitus disease~~s~~; history or diagnosis at enrollment or during the HDP study, participation in other studies or educational programs with similar topics, and score < 24 on the Mini-Mental State Test.

Drawing from studies with similar objectives,(11,15) the sample size was estimated at 30 participants per group, resulting in a total of 60 participants.. This choice was based to the fact that feasibility and acceptability studies do not require a formal calculation of the sample size.(28) Participants were randomly assigned to the control or experimental group in a 1:1 ratio. The Randomized Control Trial mobile application was used for group assignment. Only participants in the experimental group were contacted by the interventional nurse. The research assistant and the statistician responsible for data analysis were blinded to group allocation.

Data Collection Instruments

The instruments used in this study were the socio-demographic and clinical characteristics questionnaire, the feasibility format, the acceptability questionnaire, and the scales "Knowledge and self-care behaviors in the face of HDP-CoNOCiTHE" and "Determinants of self-care behaviors in the face of HDP". The demographic and clinical information questionnaire included variables, such as: age, nationality, marital status, education, employment status, and income. In addition, data were collected on obstetric history, gestational age, number of antenatal visits, and attendance to the antenatal care course. The feasibility of the study included recruitment, follow-up, and dropout rates of the participants, as well as fidelity of intervention delivery.

Acceptability was assessed using a questionnaire designed by the authors. The questionnaire assessed participants' acceptability and satisfaction in the dimensions of content, activities, delivery, and advantages and disadvantages of participating in the intervention. The questionnaire consisted of 25 items, with a 5-point Likert-type response scale, where 1 means “not at all useful or strongly disagree” and 5 means “extremely useful or strongly agreed”. Higher scores correspond to a higher levels of acceptability and satisfaction with the intervention. In addition, it included three open-ended questions that assessed the positive aspects of the intervention, educational materials and other information that should be included in the intervention. The questionnaire was administered upon completing the fourth educational session.

The scale “Knowledge and self-care behaviors in the face of HDP-CoNOCiTHE”, was developed by Ulloa *et al.*(29) This instrument has two dimensions: (1) knowledge in the face of HDP (30 items); (2) self-care behaviors (28 items). The first dimension has true/false response options, with correct responses scored 1 and incorrect responses scored 0, with a minimum of 0 points and a maximum of 30 points. The second dimension has yes or no response options, with scores of 2 points if it is a behavior aimed at preventing or controlling the risk of HDP or 0 if it is not, with a minimum of 0 points and a maximum of 56 points. Each dimension was scored separately and then transformed into an overall score ranging from 0 to 86; higher scores indicate higher levels of knowledge and self-care behaviors. Ulloa *et al.,*(30) evaluated the reliability of the scale, demonstrating a Cronbach’s alpha of 0.67 and test-retest stability with an intraclass correlation coefficient (ICC) of 0.96, which reflected the scale’s acceptable reliability.

The scale “Determinants of self-care behavior in the face of HDP” was developed by Ulloa *et al*.(31) The instrument contains 33 items distributed into four dimensions: Attitude (7 items); Subjective Norms (12 items); Perceived Behavioral Control (6 items), and behavioral intention (8 items). Response options vary on a 5-point Likert scale (1 = very unimportant to 5 = very important / 1 = strongly disagree to 5 = strongly agree). Scores range from 33 to 165, with higher scores indicating greater intention of self-care behaviors. Ulloa *et al.,*(31) assessed the feasibility and reliability of the scale with an overall instrument content validity ratio (CVR’) of 0.90. Cronbach’s alpha was 0.80 and the test-retest stability showed an ICC of 0.99.

Intervention

Before starting the study, participants in both groups completed the socio-demographic and clinical information questionnaire, and the scales “Knowledge and self-care behaviors in the face of HDP-CoNOCiTHE” and “Determinants of self-care behaviors in the face of HDP”. The participants in the experimental group received the intervention “Knowledge and self-care behaviors in the face of hypertensive disorders of pregnancy- EducaTHE”, an intervention guided by educational-, behavioral- and motivational-type TPB. The objective of the intervention was to improve the knowledge and self-care behaviors of pregnant women in the face of HDP.

EducaTHE was delivered by a nurse and organized into four 90-minute educational sessions, once a week for four weeks. Table 1 shows the four educational sessions and the contents that made up the EducaTHE intervention. Each session was developed during three moments; the first introduced the topic, followed by development of contents and activities, and the third included the session’s feedback and explanation of commitments. The sessions were developed into six groups of five participants and in the health institution where the participants received antenatal care. As educational material, the participants received the booklet “I decide to take care of the high pressure during pregnancy”. The booklet included five learning units: 1) knowledge about the disease; 2) behavioral control, positive attitude, and support from the partner, relatives, and friends; 3) dietary recommendations; 4) recommendations to improve sleep, rest, and physical exercise; and 5) promotion of mental health. Each unit incorporated reinforcement activities with illustrations, phrases, selection games and content relationships. Details of the booklet's construction and validation have been described. (32) After completing the educational intervention, participants from both groups were contacted to complete the post-test questionnaires. The experimental group was contacted four weeks after the end of the intervention, and the control group was contacted eight weeks after entering the study. The control group did not participate in the educational intervention, but continued to receive the usual care and education provided in the antenatal care and maternity and paternity preparation course, as did the experimental group.

Table 1. Description of the educational sessions of the EducaTHE intervention

Session	Content	Educational strategies
Session 1. Educational support		
Knowing about hypertensive disorders of pregnancy	• Etiology of the HDP • Risk Factors • Signs and symptoms • Maternal and fetal complications	**Educational booklet:** "I decide to take care of the high pressure during pregnancy" **Video:** Seven symptoms that every pregnant woman should know **PowerPoint presentation**
Session 2: Behavioral and motivational support		
Control over behavior, positive attitude, and support from partner, family, and friends	• Control over behavior • Attitude toward behavior •Social and family support for behavior • Intention toward behavior	**Educational booklet:** "I decide to take care of the high pressure during pregnancy" **Video**: Throw yourself PowerPoint presentation
Session 3: Educational, behavioral, and motivational support		
Dietary recommendations, sleep, rest and exercise	**Dietary recommendations** • Food groups according to the "Healthy Colombian family dish" • Dietary recommendations to prevent or control of the risk of HDP • Food preparation and consumption recommendations **Recommendations for sleep, rest and exercise** • Importance and benefits of sleep, rest, and exercise during pregnancy • Recommendations for maintaining good sleep and rest patterns • Physical activity: exercise routine during pregnancy	**Educational booklet:** "I decide to take care of the high pressure during pregnancy" **Video: Healthy Colombian family dish.** How to sleep during pregnancy? Exercises for pregnant women. **PowerPoint presentation**
Session 4: Educational, behavioral and motivational support		
Mental health promotion	• Defining stress, anxiety, and depression during pregnancy •Strategies for managing stress, anxiety, and depression • Practical activity: Breathing, relaxation, and meditation exercises	**Educational booklet:** " I decide to take care of the high pressure during pregnancy" **Video:** Stress and anxiety: What is it and what can we do? Depression during pregnancy. Guided relaxation during pregnancy. Music for pregnant women and newborns. Eight healthy habits to improve your mental health. PowerPoint presentation

Statistical Analysis

To assess feasibility and acceptability, descriptive statistics were used to summarize sample characteristics, eligibility, recruitment, follow-up, dropout, and acceptability rates. The responses to the open-ended questions were organized according to their frequency of occurrence.

To determine the potential effect of the intervention, the data were analyzed according to the intention-to-treat principle. The χ^2 test or Fisher's exact test was used to compare baseline characteristics between the groups. Normality of the data was assessed with the Kolmogorov-Smirnov test, which indicated that the data did not fit the normal model. The Mann-Whitney U test was used to determine changes between the groups. The Wilcoxon signed rank test was used for intra-group comparisons. Estimation of the effect size of the intervention on the study variables was determined using Cliff's Delta statistic (D-cliff).(33) Data were statistically analyzed using SPSS software version 25. All tests were two-sided and p-values < 0.05 were considered statistically significant.

Ethical considerations. The study protocol was approved by the Research Ethics Committee of the Faculty of Nursing at Universidad de Antioquia (Act No CEI-FE 2021-31). Participants were informed about the study and signed the informed consent form. They were also assured of the privacy and confidentiality of the information.

Results

In all, 54 pregnant women completed the study, 27 in the experimental group and 27 in the control group. At baseline, no significant differences existed between the groups in any of the sociodemographic or clinical characteristics. Participant information is detailed in Table 2.

Table 2. Demographic and clinical characteristics of participants in the experimental and control groups

Variables		Experimental group (*n* = 27) n (%)	Control group (*n* = 27) n (%)	*p*-value χ^2
Mother's Age, Median (RIQ)		22 (17)	25 (16)	0.585[a]
Nationality	Colombian	23 (85.18)	22 (81.48)	0.5
	Venezuelan	4 (14.81)	5 (18.51)	
Educational level	Primary	0 (0)	1(3.7)	0.38
	Secondary	20 (74.07)	21 (77.77)	
	Higher education	7 (25.92)	5 (18.51)	
Occupation	Housewife	22 (81.48)	17(62.96)	0.102
	Student	3 (11.11)	1 (3.7)	
	Independent	1 (3.7)	6 (22.22)	
	Employee	1 (3.7)	3 (11.11)	
Civil status	Single	1 (3.7)	6 (22.22)	0.124
	Common law	23 (85.18)	18 (66.66)	
	Married	3 (11.11)	3 (11.11)	
Economic income	< 290 US$	8 (29.62)	7 (25.92)	0.238
	290 US$	13 (48.14)	18 (66.66)	
	> 290 US$	6 (22.22)	2 (7.4)	
Gestational Age (weeks), Mean (SD)		17.15 (5.04)	14.85 (4.02)	0.069[b]
Obstetric history	Primigravid	14 (51.85)	12 (55.55)	0.336
	Multigravida	13 (48.14)	15 (62.96)	

Table 2. Demographic and clinical characteristics of participants in the experimental and control groups

Variables		Experimental group (*n* = 27) n (%)	Control group (*n* = 27) n (%)	*p*-value χ^2
Number of antenatal visits	1-2	13 (48.14)	16 (59.25)	0.691
	≥ 3	14 (51.85)	11 (40.74)	
Maternity course	Yes	1 (3.7)	2 (7.40)	0.5
	No	26 (96.29)	25 (92.59)	

[a] Mann-Whitney U test, [b] Student *t* test

The trial's feasibility is reflected by the rates achieved during its development. During the four months of the study, the recruitment rate was 75.94%. The study's follow-up rate was 90%, with 10% dropout rate. The reasons for exclusion, refusal to participate, or failure to complete the study are described in Figure 1. Therefore, 54 participants (27 in the experimental group and 27 in the control group) completed the educational intervention protocol and were included in the analyses. The number of sessions, frequency, and estimated time to conduct the intervention were carried out according to the intervention's protocol.

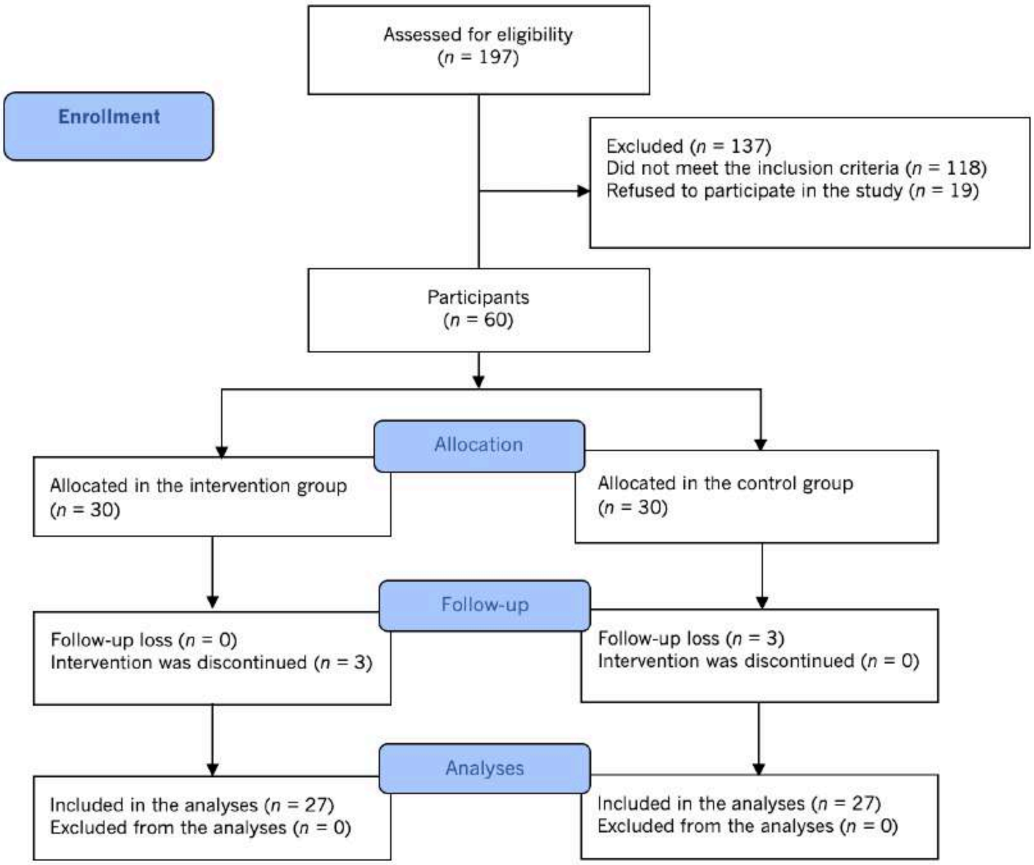

Figure 1. Flowchart of selection and retention of participants in the study

According to the acceptability, 27 participants from the experimental group answered the questionnaire. The overall acceptability of the intervention was 4.82 points out of 5. The evaluation of acceptability in all its components showed a high level of acceptance of the intervention by the participants, as detailed in Table 3. The following comments are for each of the open-ended questions. 1) What did you like most about the intervention? The answers included clear and simple explanations and recommendations (*n* = 5); dynamics, activities, and games (*n* = 5); sharing with other pregnant women (*n* = 4); the nurse's empathy, knowledge, and kindness–(*n* = 4); and the opportunity to ask questions and be listened to (*n* = 1). 2) What did you like the most about the content of the booklet? Their answers detailed: the content on HDP (*n* = 8); nutritional care (*n* = 7); exercise (*n* = 6); and sleep (*n* = 2); activities of review, organization, and ease of understanding the topics (n = 4). 3) What would you have liked to have done differently? Among the answers that stand out: a greater number of sessions of the intervention and that they were spread throughout the pregnancy (*n* = 5). In addition to this question, participants expressed satisfaction with the information received, the pleasure of participating, and the positive impact on their knowledge and care actions in the face of HDP (*n* = 11). In addition, they would be willing to participate in a similar study in the future (*n* = 6).

Table 3. Participants' acceptance with the "EducaTHE" intervention

Dimension	Number of items	Minimum value	Maximum value	Mean (SD)
1. Contents of the intervention	7	30	35	33.70 (1.35)
2. Activities in the development of the contents	3	12	15	14.25 (0.71)
3. Delivery method	3	12	15	14.25 (0.81)
4. Advantages of the intervention	7	29	35	33.66(1.61)
5. Disadvantages of participating in the intervention	4	13	20	19.44 (1.55)
6. Overall satisfaction	1	4	5	4.96 (0.19)

The impact of the "EducaTHE" intervention on self-care knowledge and behaviors, as well as on the determinants of behavior in the face of HDP, was analyzed through inter-group and intra-group comparisons. The results of these comparisons, both for the entire questionnaire and for its subscales, are presented in Table 4. In the post-intervention measurement, the experimental group showed a significant increase in the level of knowledge and self-care behaviors compared to the control group (77 vs.69; $p < 0.0001$). In the behavioral determinants, the intervention did not show significant effects on the total score ($p = 0.66$). Only the intention dimension demonstrated a significant difference between groups (38 vs. 35, $p = 0.021$). The results of the comparisons within each of the groups, before and after the intervention, revealed that the participants in the experimental group showed a significant increase in the level of knowledge and self-care behaviors in the face of HDP ($p < 0.0001$) and in the total score of determinants of behavioral intention ($p < 0.0001$) after the intervention. In contrast, in the control group, no significant differences were found in any of the variables before and after the intervention.

Table 4. Comparison of median scores of knowledge, behavior, and determinants of behavior in the face of HDP between the experimental and control groups before and after the intervention

Dimension	Pre-test		Intergroup comparison Value p^a	Post-test		Intergroup comparison Value p^a	Comparison EG* Pre-test Vs. Post-test Value p^b	Comparison CG* Pre-test Vs. Post-test Value p^b
	EG (*n*=27) Median (IQR)	CG (*n*=27) Median (IQR)		EG* (*n*=27) Median (IQR)	CG* (*n*=27) Median (IQR)			
Total Knowledge and self-care behaviors (0-86)	68 (25)	69 (21)	0.282	77 (14)	69 (23)	< 0.0001	< 0.0001	0.618
Knowledge Dimension (0-30)	25 (13)	27 (10)	0.219	29 (5)	26 (9)	< 0.0001	< 0.0001	0.741
Behavior dimension (0-56)	42 (20)	44 (18)	0.438	48 (12)	44 (20)	< 0.001	< 0.0001	0.847
Total Determinants of Behavior (33-165)	154 (32)	154 (28)	0.965	159 (16)	154 (46)	0.066	< 0.0001	0.129
Attitude dimension (7-35)	33 (7)	34 (9)	0.294	35 (3)	34 (17)	0.335	0.010	0.740
Subjective norms dimension (12-60)	57 (13)	58 (14)	0.412	58 (6)	59 (18)	0.446	0.020	0.110
Perceived behavioral control dimension (6-30)	30 (6)	30 (6)	0.465	30 (3)	30 (7)	0.423	1.000	0.704
Behavioral intention dimension (8-40)	34 (19)	34 (16)	0.503	38 (7)	35 (15)	0.021	<0.0001	0.136

[a] Mann-Whitney U test [b] Wilcoxon signed-rank test

EG*: Experimental group, GC*: Control group, IQR: Interquartile

Finally, the size of the intervention's effect at the intergroup level displayed a large effect size in knowledge, and a large effect size in self-care behaviors with a D-Cliff of 0.7517 (p = 0.001). However, the intervention had no effect on the determinants of behavior with a D-Cliff = 0.290 (p = 0.067).

Discussion

This pilot study was designed to evaluate the feasibility, acceptability, and potential effect of the "EducaTHE" nursing intervention based on the Planned Behavior Theory, and was aimed at improving the knowledge and self-care behaviors of pregnant women in the face of HDP. The feasibility of this study was determined by the recruitment, follow-up, and dropout rates of the participants.

The recruitment rate of this study was 75.94%, a measure considered acceptable compared to the study by Alnuaimi *et al.*, (13) where it was only 42%. High follow-up rates of 90% and low dropout rate of 10% in this study is similar to those reported by Gingras-Charland *et al.*,(14) and the study by Alnuaimi *et al.*,(13) with follow-up rates of 91.82% and 89.68%, respectively. However, this study achieved better results when compared with other studies reporting follow-up rates of 75%.(10,34) One reason that justifies the results obtained in terms of feasibility is the eight-week interval between pre- and post-intervention measurements, which can be seen as a short period that contributed to the participants completing the study. Second, having low-risk pregnancies as inclusion criteria prevented the ocurrence of complications, hospitalizations, or pregnancy loss, situations that condition the lack of continuity in the study. Third, the fact that they received the intervention in the institution where they receive prenatal care and lived near the hospital facilitated their access, did not generate transportation costs, and facilitated their participation. However, when the dropout reasons are analyzed, similarities are found with the reasons given by authors Strassberg *et al.,*(35) and Uğurlu *et al*.,(10) specifically, in the change of city, loss of contact, and lack of interest or desire to continue.

Another variable analyzed in this study is the intervention's acceptability. The results obtained indicate that the "EducaTHE" intervention was highly acceptable among the pregnant women who received it. This finding is quite favorable considering that Mutlaq *et al*.,(7) state that although educational interventions are essential to increase women's self-knowledge and preventive behavior in the face of pregnancy-related complications, it is necessary to continue projecting studies that determine the relevance and pertinence of these interventions in the people under study, and in the generation of evidence that contributes to improving educational processes in this population. Specifically, the results of this study showed that the contents, activities, and recommendations given during the intervention were useful and easy to comprehend and implement in the practice of prenatal care; the form of delivery was appropriate and convenient, participation brought multiple benefits, and did not generate any burden in personal or family life. These aspects indicated a level of overall satisfaction with the intervention, which received an average score of 4.96 out of 5 points.

Additionally, this study investigated the potential effect of EducaTHE intervention on improving knowledge and self-care behaviors in the face of HDP, and on the determinants that influence the intention of the behavior of pregnant women. The results showed a significant change in the total score of the knowledge scale and self-care behaviors in the face of HDP in the experimental group after receiving the intervention. These findings are consistent with several studies (3,8-10,13,15) that report significant differences in the level of knowledge and self-care behaviors between the intervention and control groups after receiving an educational program on HDP. The finding of significant changes in this study may be related to several factors. First, the content of the intervention was aimed at describing the characteristics and practices of self-care in the face of preventing or controlling the risk of HDP. Second, the educational booklet contained easy-to-understand topics, practical activities, review exercises, explanatory drawings, motivational phrases, and a prenatal care diary. These factors, along with the opportunity for participants to ask questions and the nurse's simple and illustrative explanations may have positively contributed to the acquisition and development of knowledge and self-care behaviors in the face of HDP.

Among determinants of self-care behavior in the face of HDP, the intervention did not show significant effects on the total score or on the dimensions of attitude, subjective norms, and perceived behavioral control between both groups; only a significant difference was found in the intention dimension for the experimental group. When analyzing these results, several aspects can be highlighted. In the first of these, the experimental group showed an increased median of the total score of the behavioral determinants and its reduction in the standard deviation, an aspect not evident in the control group. This could indicate that, given that this is a pilot study and the exact sample size was not determined to detect significant differences, a larger sample size might reveal a significant difference. Another hypothesis is that these types of variables are complex to modify, because of the variety of individual and contextual factors involved and that must be considered when predicting the performance of a behavior.(36) Moreover, in this study, the measurement of these variables was carried out one month after the intervention, which may be a short period of time in which a possible improvement could not be reflected, as has been shown in other studies measuring the effect between six weeks(25) and up to six months after the intervention.

The practical implications of this study raise the need for nursing interventions that integrate educational, behavioral, and motivational components. First, from the educational approach, the knowledge and self-care behaviors of pregnant women in the face of HDP are strengthened. Second, at the motivational level, greater social and family support is promoted, as well as the interest of pregnant women in achieving goals and objectives related to the development of self-care behaviors. Third, in the behavioral component, pregnant women can evaluate their behavior and identify the resources, strengths, and weaknesses that facilitate or prevent them from engaging in healthy behaviors.

Among the limitations, it should be noted that this is a pilot study, therefore, the limitations are related with the development phase and its design. First, although the sample size was adequate for a pilot study, it could be considered relatively small to obtain significant results in any of the variables raised in this study. Second, the intervention included support from a family member or significant other; however, job commitments, caring for other children, or the lack of interest did not allow for this support for most of the participants. Thirdly, this study did not follow up on the variables covered over a longer period of time, which could provide new results to support decision-making in future studies. Finally, future studies should consider the results of this research to propose a controlled clinical trial to measure the effectiveness of the "EducaTHE" nursing intervention.

Conclusion. This study assessed the feasibility, acceptability, and potential impact of "EducaTHE" nursing intervention. Feasibility assessed by recruitment, follow-up, and dropout rates demonstrated the interest of pregnant women in participating in studies that support antenatal care. High levels of acceptability and satisfaction are also highlighted, indicating that this intervention is acceptable for the target population and feasible in future studies. In terms of scope, the intervention demonstrated significant improvement in the knowledge and self-care behaviors in relation to the experimental group. Nevertheless, no significant differences were found in the determinants of behavior. Based on the results herein, the authors confirm that the "EducaTHE" intervention could be taken to the next stage to evaluate its effectiveness in a larger-scale clinical trial.

Funding. This study did not receive funding.
Acknowledgements. The authors thank the study participants and the health care staff of the institution where the study was conducted.
Conflict of interest. The authors report no conflicts of interest.

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Original Article

Resilience as Empathy Predictor in Nursing Students

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Conflicts of interest: None
Received: November 16, 2024.
Approved: February 24, 2025.

How to cite this article: Díaz-Narváez VP, Madero K, Hoyos V, Fortich-Mesa N, Vilca LW, Reyes-Reyes A, Reyes-Reyes F, Gamarra-Moncayo J. Resilience as Empathy Predictor in Nursing Students. Investigación y Educación en Enfermería. 2025; 43(1):e15

DOI: https://doi.org/10.17533/udea.iee.v43n1e15

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Investigación y Educación en
Enfermería
Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Resilience as Empathy Predictor in Nursing Students

Abstract

Objective. To determine if resilience can predict empathy. Specifically, explain what would be the effect of the resilience dimensions on the dimensions of empathy in the nursing students examined in this study. **Methods.** Cross-sectional study with the participation of 340 nursing students from a private university in Colombia. Jefferson's Empathy Scale (student version) and the Resilience-Trait Scale were used. The complete psychometry of the Empathy and Resilience scales was carried out, followed by the application of Structural Equations. **Results.** Ecological Resilience predicts negatively the dimensions of "Compassionate Care" (ß = -0.11) and "Walking in the patient's shoes" (ß = -0.19); the Engineering Resilience predicts positively the dimension "Walking in the patient's shoes" (ß = 0.08). **Conclusion.** Overall, resilience predicts empathy, thereby, introducing empathetic training of nursing students in the population studied must also include training in resilience.

Descriptors: empathy; resilience; prediction; training; students; nursing.

Resiliencia como predictor de Empatía en estudiantes de Enfermería

Resumen

Objetivo. Determinar si la resiliencia puede predecir a la empatía. Específicamente, explicar cuál sería el efecto de las dimensiones de la resiliencia sobre las dimensiones de la empatía en los estudiantes de enfermería examinados en el presente estudio. **Métodos.** Estudio transversal en el que participaron 340 estudiantes de Enfermería de una universidad privada en Colombia. Fue empleada la Escala de Empatía de Jefferson (versión estudiante) y la Escala de Resiliencia por Rasgos. Se realizó la psicometría completa de las escalas de Empatía y Resiliencia, seguido de la aplicación de Ecuaciones Estructurales. **Resultados.** La Resiliencia Ecológica predice negativamente a las dimensiones “Cuidado con compasión” (ß = -0.11) y “Caminando en los zapatos del paciente” (ß = -0.19) y la de Ingeniería predice positivamente a la dimensión “Caminando en los zapatos del paciente” (ß = 0.08). **Conclusión.** En general, la resiliencia predice la empatía, por lo tanto, la introducción de la formación empática de estudiantes de enfermería en la población estudiada necesariamente debe también incluir la formación en resiliencia.

Descriptores: empatía; resiliencia; predicción; formación; estudiantes; enfermería

Resiliência como preditor de empatia em estudantes de enfermagem

Resumo

Objetivo. Para determinar se a resiliência pode prever a empatia. Especificamente, explicar qual seria o efeito das dimensões de resiliência sobre as dimensões de empatia nos estudantes de enfermagem examinados no presente estudo. **Métodos.** Estudo transversal no qual participaram 340 estudantes de enfermagem de uma universidade privada da Colômbia. Foram utilizadas a Escala de Empatia de Jefferson (versão para estudantes) e a Escala de Traços de Resiliência. Foi realizada psicometria completa das escalas de Empatia e Resiliência, seguida da aplicação de Equações Estruturais. **Resultados.** A Resiliência Ecológica prediz negativamente as dimensões “Cuidar com compaixão” (ß= -0.11) e “Colocar-se no lugar do paciente” (ß= -0.19) e a Resiliência de Engenharia prediz positivamente a dimensão “Colocar-se no lugar do paciente” (ß= 0.08). **Conclusão.** Em geral, a resiliência prevê a empatia, portanto, a introdução do treinamento de empatia para estudantes de enfermagem na população estudada deve necessariamente incluir também o treinamento de resiliência.

Descritores. empatia; resiliência; previsão; formação; estudantes; enfermagem.

Introduction

Studies in Latin America linking resilience with empathy are quite rare, considering that resilience may be a modulator of empathy.(1) Empathy is a broad and multidimensional construct. No complete consensus exists regarding its definition.(2) In general, it is possible to find two approaches about empathy: cognitive and affective. In the first, the definition is associated with adopting the cognitive perspective "about the other ", and constitutes an attempt to understand what goes on in the minds of others. The second case consists in emphasizing the affective component over the cognitive, defining it as a shared feeling (vicarious). The division into a strictly cognitive or affective empathy did not provide a satisfactory explanation with the observational findings, requiring an integrative definition of this construct.(3) This situation constitutes the origin of different theories about empathy and explain, in part, the presence of several types of instruments that measure it.

There is agreement in that empathy is an attribute that permits an intersubjective connection between health professionals and patients.(4) This interaction contributes positively to the development of the patient's overall care process and treatment.(5) When these processes are carried out with empathy, patient care is humanized. With respect to resilience, many definitions have also been proposed. Nevertheless, no agreement has been reached regarding the concept's essential comprehension.(6) Overall, resilience may be defined as "the capacity of a dynamic system to adapt successfully to the challenges that threaten the system's function, survival, or development".(7) The problem is that no common theoretical construct exist underlying resilience research. This concept is used in many ways in function of the area of application and of the theoretical-practical support achieved. This situation prevents obtaining a common definition of the concept and said absence hinders its objective measurement (6) and makes its operationalization difficult.

So far, there are two general approaches: by buffering and by features.(8) The buffering or state approach measures resilience via a bipolar scale. The traits approach examines how individuals confront events they experience as negative and takes into account their capacity to recover.(9) It must be considered that both approaches are not mutually exclusive. However, the lack of a complete theory of resilience does not permit ensuring which of the instruments can best measure this construct. The characteristics of the constructs of empathy and resilience, already described, constitute complex systems in themselves. First, between the dimensions of each system and, second, the interactions between the dimensions of a construct with respect to the dimensions of the other. Consequently, if the theoretical inference or the empirical evidence (or both) allow verifying that a deficit in any of the dimensions would result in a loss of stability of the "system" and the construct loses its essentiality.(3) For example, in case of a critical deficit of the emotional dimension in empathy determines the presence of psychopathy.(4) Hence, trying to establish causal relationships between empathy and resilience leads us to a problem consisting of relating two complex systems whose possible solution is also complex. In this sense, the question emerges whether resilience constitutes an independent variable in relation with empathy. Various studies start with the work hypothesis consisting in that empathy can be modulated directly by resilience or conclude, with empirical evidence, that effectively resilience modulates and can predict empathy or resilience acts as mediator between another factor and empathy.(10) Consequently, it is inferred theoretically and with certain empirical evidence that the formation of empathy in nursing students cannot be conducted in separate manner from the training in resilience.

Based on these antecedents, the aim of this work was to determine if resilience can predict empathy. If it does, explain what would be the effect (overall) of the dimensions of resilience over the dimensions of empathy in the nursing students examined in the study herein.

Methods

Population and sample. The population corresponded to Nursing students in the Faculty of Health Sciences at Corporación Universitaria Rafael Núñez in Cartagena de Indias, Colombia. The sample was made up by all the nursing students registered in the Faculty of Health Sciences who accepted voluntarily to participate in this research and who were taking classes on the moment of the application of the instruments. The nursing student population consisted of 371 students, with 340 being evaluated, representing 92% of the total. The sample included 46 men and 294 women (13.5% and 86.5%, respectively, of the total sample). The ages of the nursing students had a mean of 22 years (*SD* = 4.75).

Instruments. (i) *Jefferson Empathy Scale for Health Professionals*, student version (JSE-HPS).(11) this instrument measures the levels of empathy with Health Sciences patients, in general, and it has 20 items. The questions are constructed in a Likert-type scale with responses numbered from 1 to 7, where 1 means totally disagree and 7 totally agree. It comprises three dimensions or underlying variables: Compassionate Care (CC); Adoption of the Patient's Perspective (PA); and Walking in the patient's shoes (WIPS). This instrument has demonstrated internal consistency ($\alpha > 0.80$), cultural and structural validity (CFI = 0.925; TLI = 0.914; RMSEA = 0.048) and it is one of the most used to measure non-pathological levels of empathy in students with patients. (ii) *Resilience-Trait Scale* (RTS),(12) which is structured by three dimensions: Engineering (4 items), Ecological (4 items), and Adaptative (4 items). It has a Likert-type format with 12 items, with five response levels per item, going from totally disagree to totally agree. The RTS has shown adequate reliability ($\alpha > 0.85$), a cross-culturally stable factor structure (CFI = 0.95; TLI = 0.94; RMSEA = 0.075; SRMR = 0.06), construct and convergent validity in terms of associations with personality, and a positive contribution to clinical and non-clinical states of psychological health.(13)

Data collection procedure. Data were collected by non-participating professors, duly trained for the application, belonging to the Faculty of Health Sciences at the Corporación Universitaria Rafael Núñez in Colombia. The informed consent, together with the instrument used to measure empathy and resilience, was administered and signed on paper format and during the hours before or after the professors taught their classes. The data were tabulated in an Excel spreadsheet by administrative staff in the Faculty of Health Sciences who had been trained for this purpose.

Data analysis. The data analysis used a structural equations model (SEM). The robust maximum likelihood (RML) estimator was used, and the comparative fit index (CFI) (>0.95), the Tucker-

Lewis Index (TLI) (>0.95), the root mean square error of approximation (RMSEA) (<0.08), and the standardized root mean square (SRMR) (<0.08) were used to evaluate the fit of the proposed model. Regarding the measurement models, a confirmatory factor analysis (CFA) was performed using the RML estimator, and the same fit indicators were considered as in the SEM. A *p value* <0.05 was considered to estimate a result as significant. IBM SPSS 27 was used to calculate descriptive statistics, and R in its RStudio environment for the CFA, using the Lavaan package (0.6-18) and semTools (0.5-6) packages. To determine reliability, Cronbach's alpha and McDonald's omega coefficients were used.

Ethical aspects. This research is part of a Project that studies empathy in Latin America. The project that supports this research was approved by the Institutional Bioethics Committee at Universidad Andrés Bello (Chile), Approval Minutes No. 020/2022. The participants signed the informed consent prior to starting the study.

Results

Empathy Scale. It was found that the empathy scale has adequate indices of fit to the data (χ^2 = 269.62; gl = 167; *p* < 0.001; RMSEA = 0.046 [90%CI 0.035 – 0.057]; CFI = 0.94; TLI = 0.94; SRMR = 0.061), evidencing that the instrument shows validity based on the internal structure. It also demonstrated adequate reliability levels in all its dimensions: Adoption of the perspective (ω = 0.85; α = 0.85), Compassionate Care (ω = 0.83; α = 0.83), and Placing themselves in the patient's shoes (ω = 0.69; α = 0.69). The factorial structure of the scale has shown evidence of being strictly invariant according to the sex of the participants, in the sequence of invariance models proposed: metric (ΔCFI = 0.000; ΔRMSEA = -0.001), scalar (ΔCFI = -0.004; ΔRMSEA = 0.000), and strict (ΔCFI = -0.010; ΔRMSEA = 0.002) invariance.

Resilience Scale. With respect to the resilience scale, it was found that this instrument shows strong evidence in favor of validity based on the internal structure (χ^2 = 83.64; gl = 51; *p* = 0.003; RMSEA=0.053 [90%CI 0.030 – 0.073]; CFI=0.97; TLI=0.97; SRMR =0.046). Additionally, it evidenced adequate reliability levels in all its dimensions: Engineering (ω = 0.88; α = 0.88), Ecological (ω = 0.84; α = 0.84), and Adaptative (ω = 0.73; α = 0.72). Moreover, The factorial structure of the scale has shown evidence of being strictly invariant according to the sex of the participants, in the sequence of invariance models proposed: metric (ΔCFI = -0.003; ΔRMSEA = -0.001), scalar (ΔCFI = 0.000; ΔRMSEA = -0.003), and strict (ΔCFI = 0.002; ΔRMSEA = -0.005). All these results show that both measurement models (empathy and resilience) are adequately represented and are suitable for the structural model.

Explanatory model. This study evidenced that the structural model has adequate fit indices (χ^2 = 651.17; gl = 449; *p* < 0.001; RMSEA = 0.038 [90%CI 0.031 – 0.045]; CFI = 0.95; TLI = 0.94; SRMR = 0.043). Figure 1 shows that the Engineering dimension managed to predict positively the dimension "walking in the patient's shoes" (ß = 0.08). Regarding the Ecological dimension, it is noted that it predicts negatively the dimensions "Compassionate Care" (ß = -0.11) and "walking in the patient's shoes" (ß = -0.19) of empathy. The Adaptive dimension did not manage to predict the empathy components in nursing students.

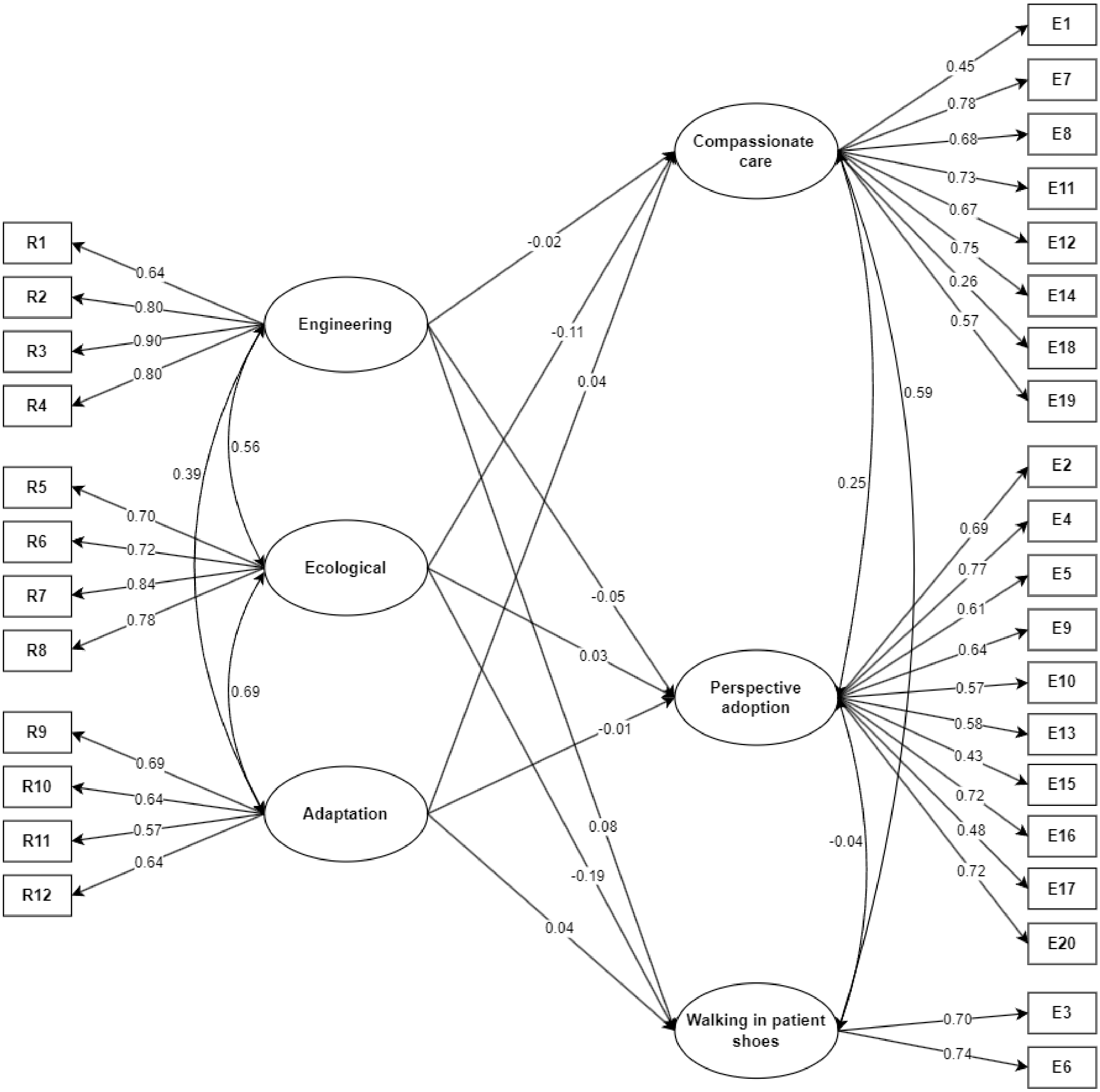

Figure 1. Explanatory model of compassion in nursing students

Discussion

The results of the reliability tests, factorial structure of the data, adjusted to the underlying three-factor model, and invariance in the two constructs studied were all found satisfactory. The fact that the psychometric premises are met indicates that there are no biases derived from the measurement models, thus, it is possible to trust the results.

From the theoretical point of view, Ecological Resilience is characterized by the system's ability to withstand an alteration, before applying the capacities that allow reordering the psychological procedures and "mechanisms" that will subsequently enable recovery of the stable state in relation to the functional structure and identity of the system that existed prior to the disturbance. Hence, Ecological Resilience focuses on the fact of "understanding the nature and magnitude of the disturbance nursing students will have to resist and absorb. The negative prediction of Ecological Resilience about the CC and WIPS dimensions observed could be the consequence of the confrontation of a disturbance caused by a deficiency in the capacity to resist it: negative coping. This situation would lead to a lack of emotional connection with the patient and, simultaneously, reduce the ability to understand what the patient thinks and feels. In this sense, the effect of "empathic erosion"(3) in nursing students is known as a result of their role in patient care and the responsibility they assume, adding, the academic load itself, among other factors. Thereby, students undergo a complex adjustment(14) due to existing exogenous and/or endogenous pressures, which can persist discretely throughout their career. Within this context, when coming into contact with patients in the clinical area, these pressures are even greater.(15) Existence of factors influencing upon this adjustment has been proposed:(16) emotional regulation, self-concept, meaning of life and depression,(17-20) burnout and self-efficacy,(21,22) among others. These antecedents and, considering that this research is cross-sectional and does not account for the dynamics of the phenomenon over time, the existence of decreased CC levels – due to the lack of or deficiency of the necessary traits to confront, resist, and absorb the disturbance, could constitute only a snapshot of the relationship between resilience and empathy in the sample studied, but in the absence of a well-founded empathic intervention,(13,14) This deficit could remain active in the remaining process of these students' training, with the relevant consequences. The deficit could be explained by the focus and effort students make to resist and absorb the disturbances derived from the health status (severity of the disease) of the patients whom they could care for daily without the necessary mechanisms to successfully cope and they do so at the expense of being emotionally affected. This situation could become one of the mechanisms that could explain, in part, the presence of empathic erosion.

It could also happen that, besides the aforementioned focus, diminished emotionality (CC) might be associated with a possible preexistence of a deficit in emotional regulation that would affect the ability to understand the subjectivity of the patient's thinking (WIPS), but without affecting the patient's capacity for intellectual comprehension (PA). Engineering resilience (ER), however, predicts a slight WIPS increase. A likely explanation is that the traits associated with this engineering dimension enhance the ability to regain balance in the students in the sample, but said effect would occur after the students were able to resist and absorb the disturbance. Thus, these results propose that the nursing students examined would have a low threshold to withstand exogenous or endogenous disturbances, but a certain capacity to recover from the initial disturbing impact upon resolving the ecological stage of resilience.

Despite the strengths of this work, it is pertinent to consider some limitations; for example, these types of studies must consider that the possible relationship (prediction) of a construct, like resilience over empathy, cannot fully explain the observed empathic response, given the empirical evidence and theoretical reasons that empathy could be the "product" of the influence of several independent factors or modulators of empathy.(3,12-14,23) This situation must necessarily imply predictive estimations with relatively low values. In this context, obtaining high prediction values could be considered "suspicious" of a biased evaluation. Further, statistical significance should not be taken as a "gold standard" in these types of research processes. Inferring that data analysis only seeks to find "significant" or "insignificant" results may represent a typical case of reductionism.(24) Consequently, the fact that no statistical significance was found could not be interpreted as a result of low interest given the foregoing. In the context of results with complex variables (empathy and resilience), it is possible to find insignificant values more often than expected; however, these may have an association strength that must be considered based on the nature of the object being analyzed, as is the case with the complex variables in this study(25)

The findings observed in this study permit concluding that empathy is not an independent attribute and that it can be predicted from resilience. Therefore, the positive development of empathy formation also depends, in part, on the development of resilience in the students examined. The teaching-learning processes that involve empathy formation must necessarily be intertwined with the formation of resilience.

Access to data if required: can be found in: https://doi.org/10.17605/OSF.IO/JSKDR

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Original Article

UNIVERSIDAD DE ANTIOQUIA
1803

Potentialities and challenges of stricto sensu graduate studies in health: A qualitative meta-synthesis

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Conflicts of interest: None.

Received: October 6th, 2023.

Approved: February 28th, 2025.

How to cite this article: Cassiano C, Leal LA, Bernardes MA, Carvalho JCM, Henriques SH. Potentialities and challenges of stricto sensu graduate studies in health: A qualitative meta-synthesis. Investigación y Educación en Enfermería. 2025; 43(1):e16.

DOI: https://doi.org/10.17533/udea.iee.v43n1e16

Investigación y Educación en
Enfermería

Vol. 43 No 1, January-April 2025
ISSNp: 0120-5307 • ISSNe: 2216-0280

Potentialities and challenges of *stricto sensu* graduate studies in health: A qualitative meta-synthesis

Abstract

Objective. To analyze the potentialities and challenges of *stricto sensu* graduate programs in the health field from the perspective of post-graduate students and graduates. **Methods.** This study is a qualitative meta-synthesis analyzing 23 studies selected from the following databases: BDENF, LILACS, MEDLINE via PubMed, PsycINFO and Scopus in Spanish, English and Portuguese, published between 2002 and 2022. Data were analyzed using the constant comparative analysis technique. **Results.** The synthesis identified the potentialities and challenges of *stricto sensu* graduate studies across four domains: personal, academic, professional, and social. Key potentialities included the development of research skills, the production of relevant studies, the training of highly qualified professionals, and interdisciplinary collaboration. However, significant challenges were also noted, such as time management difficulties, high academic demands, competitiveness, workload overload, financial constraints, and professional undervaluation. **Conclusion.** The qualitative studies reviewed highlight both the potentialities and challenges of *stricto sensu* graduate programs in the health field, emphasizing their impact on personal, academic, professional, and social aspects. It is essential for training institutions to develop and implement strategies that support graduate students in overcoming the challenges inherent in this formative process.

Descriptors: education; education, graduate; teaching; students; research; graduate programs in health.

Potencialidades y desafíos de los estudios de posgrado *stricto sensu* en el área de la salud: metasíntesis cualitativa

Resumen

Objetivo. Analizar las potencialidades y los desafíos de los cursos de posgrado *stricto sensu* en el área de la salud, desde la perspectiva de estudiantes de posgrado y egresados. **Métodos.** Metasíntesis cualitativa, a través de la cual se realizó el análisis de 23 estudios, seleccionados de las bases de datos: BDENF, LILACS, MEDLINE vía PubMed, PsycINFO y Scopus en español, inglés y portugués, publicados entre 2002 y 2022. El análisis de datos se llevó a cabo mediante la técnica comparación constante. **Resultados.** La síntesis permitió destacar potencialidades y desafíos de los estudios de posgrado *stricto sensu* en los siguientes ámbitos: personal, académico, profesional y social. Entre las potencialidades, se destacaron el desarrollo de competencias de investigación, estudios relevantes, la formación de profesionales calificados y la colaboración interdisciplinaria. No obstante, existen desafíos como dificultades en la gestión del tiempo, altas exigencias académicas, competitividad, sobrecarga, dificultades financieras y desvalorización. **Conclusión.** Los estudios cualitativos exploraron las potencialidades y los desafíos de los programas de posgrado *stricto sensu* en el área de la salud, con énfasis en este estudio en las dinámicas personales, académicas, profesionales y sociales del campo. Resulta relevante para los centros de formación la creación y gestión de estrategias que inciten a los estudiantes de posgrado a enfrentar, sobre todo, los desafíos presentes en este proceso formativo.

Descriptores: educación; educación de posgrado; enseñanza; estudiantes; investigación; programas de posgrado en salud.

Potencialidades e desafios da pós-graduação *stricto sensu* na área da saúde: metassíntese qualitativa

Resumo

Objetivo. Analisar as potencialidades e os desafios dos cursos de pós-graduação *stricto sensu* na área da saúde, na perspectiva de pós-graduandos e egressos. **Métodos.** Trata-se de uma metassíntese qualitativa, por meio da qual foram analisados 23 estudos, selecionados nas seguintes bases de dados: BDENF, LILACS, MEDLINE via PubMed, PsyINFO e Scopus em espanhol, inglês e português, publicados entre 2002 e 2022. Os dados dos artigos foram analisados utilizando a técnica de análise de comparação constante. **Resultados.** A síntese permitiu evidenciar as potencialidades e os desafios da pós-graduação *stricto sensu* nos âmbitos: pessoal, acadêmico, profissional e social. Dentre as potencialidades, destacaram-se o desenvolvimento de competências de pesquisa, estudos relevantes, formação de profissionais qualificados e colaboração interdisciplinar. No entanto, há desafios, como dificuldades na gestão do tempo, alta exigência acadêmica, competitividade, sobrecarga, dificuldades financeiras e desvalorização. **Conclusão.** Os estudos qualitativos exploraram as potencialidades e os desafios dos programas de pós-graduação *stricto sensu* na área da saúde, destacando-se nesta pesquisa as dinâmicas pessoais, acadêmicas, profissionais e sociais do campo. É relevante que os centros formadores criem e gerenciem estratégias que auxiliem os pós-graduandos a enfrentarem, sobretudo, os desafios presentes nesse processo formativo.

Descritores: educação; educação de pós-graduação; ensino; estudantes; investigação; programas de pós-graduação em saúde.

Introduction

Stricto sensu graduate programs, including master's and doctoral degrees, aim to train future educators and researchers, significantly contributing to society through the expansion of higher education and the promotion of research. In Brazil, this expansion has been evident and has contributed to advancements in knowledge, science, innovation, and technology, which are critical aspects for economic and social achievements.(1) Thus, driven by demand and supported by governmental policies, an increasing percentage of health professionals have applied to graduate programs.(2) In this regard, it is known that graduate programs in the health field are essential for knowledge production as well as for addressing societal needs and enhancing professional skills in their respective fields.(3) Within this context, the potentialities and challenges within graduate education in the health field raise interest for those undertaking such programs. The reasons for choosing a *stricto sensu* graduate program may be related to the pursuit of knowledge or career advancement.(4) Research has shown that financial success, salary increases, and the opportunity to perform meaningful work for society are also significant motivational factors in this formative process.(5,6) It should be emphasized that pursuing a *stricto sensu* graduate degree holds notable importance for health professionals, as research has a relevant societal impact and influences students' learning styles, promoting critical analysis, skill acquisition, information literacy, and evidence-based practice, which is crucial in health services.(7) Such aspects represent potential benefits for intellectual development, competency building, and career progression. However, to acquire academic skills and advance professionally, research opportunities, academic support, and appropriate professional positions aligned with one's qualifications must be encouraged.(8)

It is evident that entering a *stricto sensu* graduate program can lead to significant changes, generating expectations regarding this new phase of life and its academic demands.(9) Moreover, from a global perspective, graduate education faces numerous challenges;(10) after enrollment, students must undertake a series of tasks, such as the research process, which involves identifying a topic, collecting and analyzing data, writing, and even publishing articles.(2) It is worth noting that academia has faced a mental health crisis, particularly affecting early-career researchers.(11) Challenges may also be related to the research execution process, presenting barriers that need to be overcome to achieve success. Nevertheless, some students are unable to overcome these obstacles and may feel isolated during the process. Moreover, ineffective communication, unsupported responsibilities, lack of counseling and guidance, and misunderstanding of the research process can pose significant challenges during *stricto sensu* graduate studies.(12)Thus, the current transformation of the labor market has influenced the construction of professional trajectories and the development of career management strategies and personal goals. Given this scenario, health professionals constantly seek improvement to meet labor demands, despite the challenges that may arise. Furthermore, the post-industrial society, economic instability, and restructuring within health organizations require qualification and adaptation of professionals to the work context, impacting career trajectories and potentially altering the perspectives of these health workers and their entry into *stricto sensu* graduate programs.

Analyzing the potentialities and challenges of master's and doctoral programs, whether academic or professional, in the health field is justified by the fact that this is a pressing issue requiring qualitative exploration, given the limited data on the topic examined through this methodological approach. Moreover, it becomes relevant to understand how these potentialities contribute to personal, professional, and collective development, encompassing graduate programs and society as a whole. It is also necessary to analyze the challenges faced by these students, enabling the adoption of management strategies that overcome or minimize these issues. In light of the above, the objective of this study is to analyze the potentialities and challenges of *stricto sensu* graduate programs in the health field from the perspective of current students and alumni.

Methods

This is a qualitative meta-synthesis, which consists of synthesizing and interpreting the results of qualitative studies within a specific area to achieve a broader understanding and formulate new findings that go beyond existing studies.(13) Thus, the proposal by Sandelowski and Barroso was adopted,(13) which follows a set of steps including formulating the research question, identifying and systematically selecting the articles to be analyzed, evaluating the chosen articles, extracting relevant data, and synthesizing the results. To ensure data reliability and methodological transparency in this review, the protocol was submitted to the Open Science Framework (OSF/Center for Open Science/USA) for registration purposes, with the DOI identification: 10.17605/OSF.IO/SPZQT. It is worth noting that a search conducted in May 2023 in the registry did not locate any protocols on this topic. It should also be emphasized that recommendations outlined in the Enhancing Transparency in Reporting the Synthesis of Qualitative Research (ENTREQ)(14) were used to draft the qualitative synthesis.

A literature search was conducted to identify original studies with a qualitative approach addressing the theme, aiming to enhance understanding of the subject based on the following guiding question: "What are the qualitative evidences regarding the potentialities and challenges of *stricto sensu* graduate programs in the health field, from the perspective of current students and alumni?" For this study, five databases were utilized: Nursing Database (*Base de Dados da Enfermagem* - BDENF), Latin American and Caribbean Literature in Health Sciences (*Literatura Latino-Americana e do Caribe em Ciências da Saúde* - LILACS), MEDLINE via PubMed (United States National Library of Medicine), PsycINFO (American Psychological Association), and Scopus (Elsevier).

Original articles that employed qualitative methodologies, as well as descriptive and exploratory studies involving qualitative data analysis, were considered for inclusion. These studies were required to have been conducted with students currently enrolled in and pursuing a master's or doctoral program, whether academic or professional, or with alumni, and the graduate program had to be in the health field. Studies were included if their participants were graduate students pursuing a master's and/or doctoral degree in the health field. The inclusion of studies with graduate students was based on their firsthand experience of the current realities of graduate education, while studies with alumni were included because, despite having completed their programs, they also experienced this formative process and possessed knowledge of the academic context and relevant experiences. Studies published in Spanish, English, or Portuguese between 2002 and 2022 were included. Additionally, mixed-methods studies in which the qualitative analysis of results was presented separately from quantitative data were also incorporated. Studies that did not align with the Population, Context, and Concept (PCC) strategy(15) were excluded: P – Population (master's students, doctoral students, or alumni), C – Concept (qualitative studies addressing potentialities and/or challenges of *stricto sensu* graduate programs), and C – Context (health field), consistent with the study objectives and research question.

Data collection was performed independently by two reviewers between June and July 2023. The search strategy included keywords based on the pre-established PCC acronym.(15) Thus, the strategy was constructed using Health Sciences Descriptors (*Descritores em Ciências da Saúde* - DeCS) and Medical Subject Headings (MeSH), along with additional keywords to recruit more studies encompassing the theme, combined using Boolean operators (AND and OR): 'Master's Degree/Mestrado', 'Mastering/Mestrando','PhD/Doctorate/Doutorado', 'Doctorate student/PhD student/Doutorando', 'Postgraduate/Pós-graduação', 'Graduate education/Ensino de Pós-Graduação', 'Education, Graduate/Educação de Pós-Graduação', 'Health/Saúde', 'Health Personnel/Pessoal de Saúde', 'Health Post graduate Programs/Programas de Pós-Graduação em Saúde'.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)(16) was also used to describe the process of searching the scientific literature. The articles were transferred to the Rayyan™ software(17) to carry out the selection process and identify any duplicates. The included articles were re-read by two authors, and the data extraction process occurred through a spreadsheet designed based on the research question adopted in this meta-synthesis and the general characteristics of the studies: year of publication, authors, country of origin, journal, methodological aspects (study design, participants, and data collection procedures), and the results presented on the topic.

The quality of the articles was assessed independently by two reviewers using the Critical Appraisal Skills Programme (CASP).(18) This is an instrument consisting of a checklist with ten questions aimed at evaluating the description and relevance of the objectives of qualitative studies. Several aspects of the articles were evaluated, including the appropriateness of the qualitative methodology, study design, recruitment strategy, data collection, adequacy of the researcher-participant relationship, ethical considerations, rigor of data analysis, presentation of results, and the study's contributions. Any discrepancies between the reviewers were addressed and resolved through in-person discussions until a consensus was reached. To perform the data analysis and develop the synthesis, the constant comparison analysis technique proposed by Sandelowski and Barroso(13) was applied. For the development of categories and interpretive synthesis, the properties and variations indicated by the results were considered, as well as the underlying concepts and explicit or implicit conceptual relationships in the data. Additionally, concepts from the literature were incorporated to integrate the findings into a central concept. The obtained codes were organized into taxonomies according to their similarities. The coding and categorization process was carried out by two authors, who discussed discrepancies together. To ensure the validity of the synthesis, three other authors with experience in qualitative research carefully reviewed the accuracy of the codes, taxonomies, and concepts related to the categories.

Results

A total of 1,986 studies were identified across the five databases used, and from this total, 45 duplicate articles were excluded, leaving 1,941 studies. Subsequently, two independent reviewers conducted a title and abstract screening, considering the inclusion and exclusion criteria. In all, 131 articles were initially selected as meeting the inclusion criteria. Furthermore, a full-text review of these studies was conducted, during which 38 were excluded for not being freely available, 18 were excluded for addressing a different population and not specifically master's or doctoral students or alumni of *stricto sensu* graduate programs. Additionally, 24 studies that did not specify the context of graduate education in the health field were excluded, as well as 28 studies that did not encompass the concept, i.e., studies with a different methodological design and/or that did not address potentialities and/or challenges of *stricto sensu* graduate programs. The flowchart of the article selection process is presented below, as shown in Figure 1.

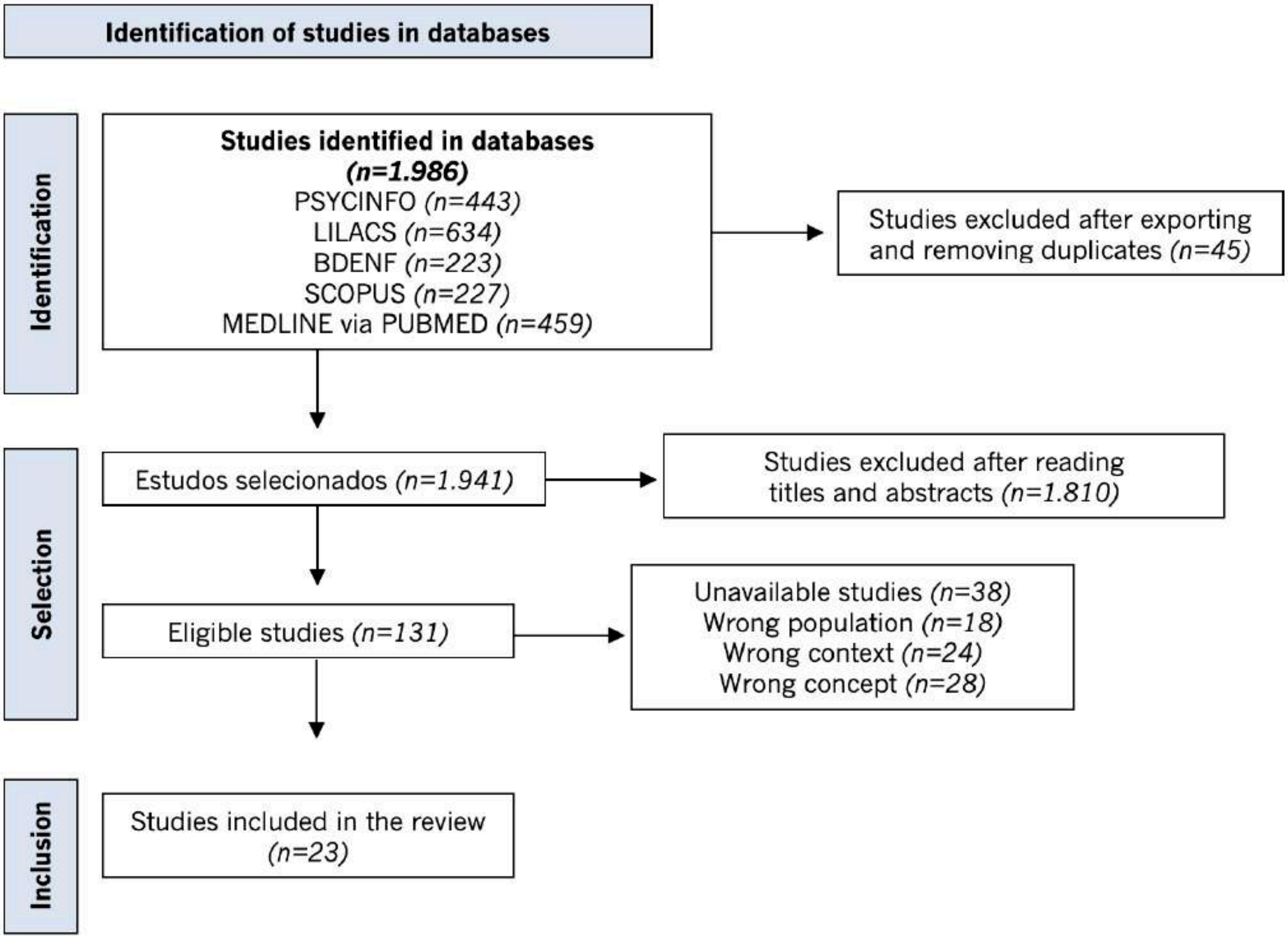

Figure 1. Flowchart of the article selection process for the qualitative meta-synthesis

According to the search strategy developed, the languages, and the period used for article selection, from the 131 eligible studies, the final sample consisted of 23 studies. Regarding language, 12 (52.17%) studies were published in English,(19-20,28,31,33-34,36-41) and 11 (47.82%) in Portuguese.(21-27,29-30,32,35) Regarding the publication period, the studies were published between 2006 and 2022, originating from 11 different countries: ten (43.48%) from Brazil,(21-27,29,32,35) three (13.04%) from the United States,(28,34,37) two (8.69%) from Canada,(20,36) two (8.69%) from Norway,(38,33) one (4.35%) from Australia,(19) one (4.35%) from France,(40) one (4.35%) from New Zealand,(31) one (4.35%) from the United Kingdom,(39) one (4.35%) from Sweden,(41) and one (4.35%) from Turkey.(30)

Only five studies used theoretical frameworks in their investigations. Of these, one(21) (4.35%) study used the institutional analysis framework, one(29) (4.35%) used the sociopoetic framework, one(31) used Vroom's expectancy theory, one(35) (4.35%) used the psychodynamics of work, and one(41) (4.35%) used dialectical hermeneutics based on the fourth-generation evaluation model. Thus, 18(19-20,22-28,30,32-34,36-40) (78.26%) studies adopted a generic approach, meaning they did not specify the theoretical framework used; of these, eight(20,24,26,32,37-40) (34.78%) used a mixed-methods approach. Regarding data collection, ten (41.66%) studies conducted semi-structured interviews,(19,21,23,27-28,30,34-35,40-41) eight (34.78%) studies used open-ended/essay questions,(22,24,26,31-32,37-39) three (13.04%) adopted focus groups,(20,25,33) one (4.35%) study used a combination of focus groups and individual interviews,(36) and one (4.35%) adopted the researcher group.(29) The 23 studies included a total of 621 participants; 21 (91.30%) studies(19-25,27-36,38-41) presented potentialities and challenges, one(26) (4.35%) study presented only strengths, and one(37) (4.35%) study presented only challenges of *stricto sensu* graduate programs in the health field. The characteristics of the studies are presented in Table 1.

Table 1. Characteristics of original studies included in the qualitative meta-synthesis

First Author, country, year	Journal	Design and data collection	Participants
Ellis LB. Australia 2006(19)	*Nurse Education Today*	Qualitative Semi-structured interview	Enrolled students in one of the professional doctorate programs (n=14). Nurses and midwives Nurses and midwives
Kearney R. Canada 2007(20)	*Academic Medicine*	Mixed Focus group	The focus group at the University of Calgary had five participants, and at the University of Alberta, seven participants (Canadian physicians with doctoral and master's degrees)
Depes VBS. Brazil 2013(21)	*Revista Gaúcha de Enfermagem*	Qualitative Exploratory Institutional Analysis Framework Semi-Structured Interview	Nine graduates, master's in nursing

Table 1. Characteristics of original studies included in the qualitative meta-synthesis (Cont.)

First Author, country, year	Journal	Design and data collection	Participants
Costa CMM. Brazil 2014(22)	*Saúde e Sociedade*	Qualitative Open-ended questions	20 students: 13 master's and 7 doctoral students, 18 from the Nutrition and Public Health Programs at the Public Health School, 1 from the USP Nursing School, and 1 from the Fernando Pessoa University, Portugal
Mendes VR. Brazil 2014(23)	*Revista Brasileira de Ciências do Esporte*	Qualitative Case study Semi-structured interview	Master's Programs in Physical Education, seven students enrolled in all research lines of the program and scholarship recipients
Souza LKCS. Brazil 2014(24)	*Revista de Nutrição*	Mixed Questionnaire and open-ended question	177 master's graduates from graduate programs in the field of Nutrition
Tavares CMM. Brazil 2014(25)	*Revista da Rede de Enfermagem do Nordeste*	Qualitative Exploratory Case study Focus group	12 newly admitted students in the Professional Master's Program in Nursing
Geremia HC. Brazil 2015(26)	*Psicologia: Ciência e Profissão*	Mixed Questionnaire and essay questions	29 psychologists, students in the master's program in psychology at a Brazilian federal university
Galdino MJQ. Brazil 2016(27)	*Revista de Enfermagem UFPE online*	Qualitative Descriptive Exploratory Semi-structured interview	25 master's students in nursing from a Brazilian public university
Remich R. United States 2016(28)	*Academic Medicine: Journal of the Association of American Medical Colleges*	Qualitative Semi-structured interview	22 students in a biomedical doctorate program
Ferreira RE. Brazil 2018(29)	*Revista de Enfermagem UFPE online*	Qualitative Descriptive *Sociopoética* A research group with aesthetic experimentation working with the five senses	12 nurses enrolled in the academic and professional master's programs
Ünal A. Turkey 2018(30)	*Acta Paulista de Enfermagem*	Qualitative Descriptive Semi-structured interview	16 individual interviews with doctoral students enrolled at the Institute of Health Sciences, Nursing Schol

Table 1. Characteristics of original studies included in the qualitative meta-synthesis (Cont.)

First Author, country, year	Journal	Design and data collection	Participants
Alamri Y. New Zealand 2019(31)	*BMC Medical Education*	Qualitative Exploratory Vroom's Expectancy Theory Open-ended questions	22 former and current MBChB/PhD students, Dean's Office, Otago Medical School, Dunedin, New Zealand
Engstrom EM. Brazil 2020(32)	*Ciência e Saúde Coletiva*	Mixed Questionnaire and essay questions	22 graduates of the Professional Master's in Primary Health Care in the Municipality of Rio de Janeiro, Brazil.
Kjellaas S. Norway 2020(33)	*Nordic Journal of Nursing Research*	Qualitative Descriptive Focus group	18 participants: fifteen had a master's in clinical nursing, and three had a master's in community health, public health, and nutrition/ health
May JT. United States 2020(34)	*Journal of Professional Nursing*	Qualitative Descriptive Semi-structured interview	4 nursing students with a dual DNP doctorate
Moreira DA. Brazil 2020(35)	*Revista Brasileira de Enfermagem*	Qualitative Integrated single case study Work psychodynamics Semi-structured interview	23 students participated: 12 master's and 11 doctoral students in a *stricto sensu* Nursing Graduate Program in Brazil
Allard E. Canada 2021(36)	*Nurse Education in Practice*	Qualitative Focus group / Individual Semi-structured interview	15 doctoral students in nursing at a Canadian school.
Chakraverty D. United States 2022(37)	*BMC Medical Education*	Mixed Questionnaire and essay questions	9 MD-PhD students and residents (five men, four women; four white, five from other ethnic backgrounds) also completed an interview.
Darj E. Norway 2022(38)	*International Journal of Environmental Research and Public Health*	Mixed Questionnaire and essay questions	39 doctoral graduates from the Norwegian School of Global Health Research
Hampshaw S. United Kingdom 2022(39)	*Nurse Education in Practice*	Mixed Questionnaire and essay questions	47 nurses with a doctorate (including 33 adult health nurses, 4 mental health nurses, 6 pediatric nurses, 2 health visitors, and 2 midwives)
Met N. France 2022(40)	*Journal of Nursing Management*	Mixed Questionnaire and Semi-structured interview	45 semi-structured interviews with nurses, 10 interviews with health managers and head nurses
Nylander E. Sweden 2022(41)	*New Review of Academic Librarianship*	Qualitative Exploratory Dialectical hermeneutics based on the fourth generation evaluation model Semi-structured interview	Twelve open interviews with doctoral students and their advisors at the Research School of Health and Welfare in Jönköping, Sweden

The overall quality of the studies included in the meta-synthesis was satisfactory (Table 2). All(19-41) demonstrated coherence between objectives, methodology, research design, recruitment strategy, research question approach, clear results, and contributions. However, it is worth noting that two(22-23) (8.69%) did not describe the ethical aspects of the research, and in most cases, 13(19,21,22-27,31,36,38-40) (56.52%), reflexivity aspects were not mentioned, i.e., the researcher's critical analysis of their relationship with participants and the possibility of bias. Regarding the relationship between the researcher and participants, nine(20,28-30,32-33,35,37,41) (39.13%) were classified as partially considered, as the study mentioned that the researcher conducted data collection; however, aspects of reflexivity were not cited. It is worth noting that only one(34) (4.35%) study adequately addressed the relationship between the researcher and participants. Finally, two(24,26) (8.69%) studies did not describe the data analysis process.

Table 2. Results of the quality assessment of articles according to CASP

Questions	Yes	Partially	No
1. Were the research objectives clearly reported?	(19-41)		
2. Was the qualitative methodology appropriate?	(19-41)		
3. Was the research design suitable for achieving the proposed objectives?	(19-41)		
4. Was the recruitment strategy appropriate for the research objectives?	(19-41)		
5. Were the data collected in a way that addressed the research question?	(19-41)		
6. Was the relationship between the researcher and participants properly considered?	(34)	(20, 28-30, 32, 33, 35, 37, 41)	(19, 21, 22-27, 31, 36, 38-40)
7. Were ethical issues considered?	(19-21, 24-26, 28-41)	-	(22-23)
8. Was the data analysis sufficiently rigorous?	(19-23, 25, 27-41)	-	(24-26)
9. Were the results clearly reported?	(19-41)		
10. Did the research provide contributions?	(19-41)		

Knowledge Synthesis

The knowledge synthesis allowed for categorizing potentialities and challenges and subcategorizing them into four domains: personal, academic, professional, and social. All these domains correspond to both potentialities and challenges, as they enable their articulation according to the studies analyzed in this meta-synthesis. The categorization and subcategorization are presented in Figure 2.

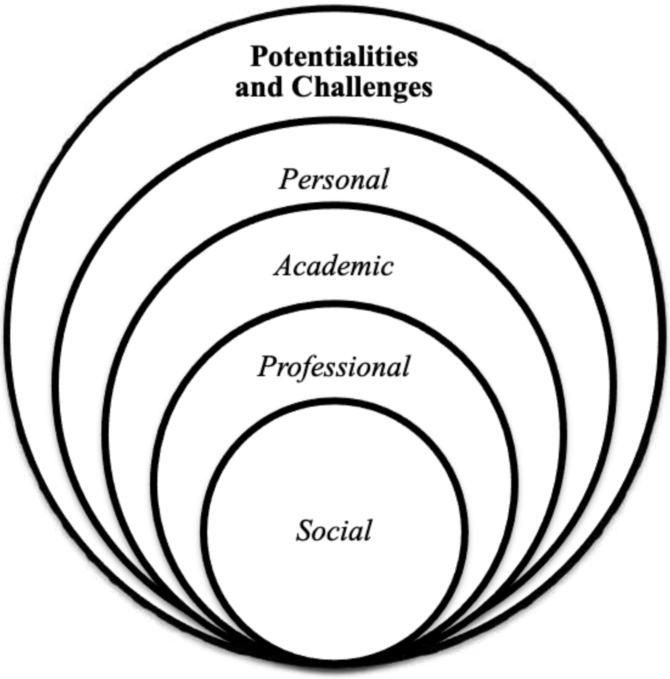

Figure 2. Presentation of the knowledge synthesis based on the potentialities and challenges identified

From the schematic representation of the results, as shown in Figure 2, it is understood that potentialities and challenges, although subdivided into personal, academic, professional, and social domains in this meta-synthesis, are not necessarily isolated, as they may integrate depending on the situation. For example, a high level of skills, knowledge, and experience, while categorized as a personal strength, also supports academic strength/professional. Thus, each categorization of potentialities and challenges can intersect in specific situations and reverberate across other domains. For instance, academic strength derived from research development can impact social strength. The same applies to challenges. Below, Tables 3 and 4 will describe, based on the selected studies, the strengths and challenges arising from *stricto sensu* graduate programs in the health field. According to the analysis by the authors of this meta-synthesis, the potentialities and challenges identified in the studies are subdivided into personal, academic, professional, and social categories:

Table 3. Personal, academic, professional, and social potentialities

Personal potentialities
Acquired knowledge(21,30,35,40)
Confidence(21,39,41)
Reaffirmation of ethical values(21,25)
Critical thinking(22,25,39)
Achievement of a dream(27,29)
Autonomy(29,31)
Pride and satisfaction in completing the program(27,39)
Ability to develop arguments(19)
Intellectual reward(20)
Capacity for personal transformation; self-esteem, belief in one's potential; overcoming; recognition of limitations; solidarity(21)
Tolerance and resilience(23)
Gender as a source of pride and strength(28)
Empowerment(29)
Self-recognition(27)
High level of acquired skills(30)
Motivation; maturity(31)
Support from colleagues, family, and friends(36)
Maturity; satisfaction in achieving individual goals; self-taught ability and informational competence(41)
Academic potentialities
Advanced development of research skills(19,31)
Participation in research projects(19,40)
Qualification for teaching(24,35)
Advancement of research in the field of study(19)
Motivation for a research career(20)
Mobilization of the educational process(21)
Quality of education, derived from duration of stay, student dedication, and graduate commitment(23)
High qualification of faculty; scientific improvement(24)
Importance of the advisor(26)
Knowledge production; interdisciplinary nature of the program(29)
Ability to conduct research and publish findings(30)
Experience(31)
Participation in courses; recognition of work developed; university reputation; research development(35)
Diverse pedagogical strategies: problem-based learning, active teaching methodologies; availability and harmonious relationship with coordination and faculty(32)
Educational, interesting, exciting, and enriching potential of scientific investigations(33)
Advisor's conduct characterized by accessibility, feedback, and investment in students(34)
Academic development(40)
Academic networking(38)
Fulfillment of educational roles(39)

Table 3. Personal, academic, professional, and social potentialities (Cont.)

Professional potentialities
Connection between research and professional practice, contributing to service delivery(19,21-22,25,29,31,39)
Salary increase(22,26,33)
Career planning(26,31)
Encouragement to pursue a doctorate at work(22,40)
Professional development(27,30)
Problem-solving ability(30,33)
Professional credibility; clinical leadership(19)
Professional recognition(22)
Institutional recognition(25)
Pursuit of a teaching and research career; search for qualification(26)
Job opportunities(32)
Enhanced competence; greater professional confidence; effective services; decision-making and responsibility in disseminating knowledge to colleagues and supervisors; assistance in development projects and tasks at work; evidence-based practice(33)
Career progression; working in Higher Education Institutions(39)
Teaching in healthcare services(40)
Social potentialities
Social recognition and appreciation for undertaking a *stricto sensu* graduate program(26,39)
Encouraging individuals within one's social circle to pursue the program(21)
Social representation(28)
Social contribution derived from the studies conducted(30)

Regarding challenges, which are categorized as personal, academic, professional, and social, the results are presented in Table 4:

Table 4. Personal, academic, professional, and social challenges

Personal challenges
Difficulty balancing the program with family demands(20,36,41)
Personal demands(20,27)
Stress(39,41)
Family support; time management(20)
Pursuing only the degree without ensuring actual growth opportunities(22)
Questions about the relevance of the program; problematic phase transitions and psychological suffering, including dissatisfaction, physical and emotional exhaustion(31)
Insecurity, feelings of disqualification; lack of family recognition; minority status (race, social condition)(37)
Being new to the country where the graduate program is conducted(38)
Disappointment, lack of support(39)
Confusion, frustration(41)

Table 4. Personal, academic, professional, and social challenges (Cont.)

Academic challenges
Lack of funding(19-20,31)
Demands for productivity; competition among students(23,35)
Tight deadlines(24,35)
Conducting solitary work(29,35)
Lack of experience and skills of the advisor(36,37)
Traditionalism, resistance to change; difficulties in data collection; challenges obtaining ethical approval; scarcity of advisors(19)
Need for institutional support; need to balance teaching demands(20)
Overload(23)
Difficulty in publishing; pressures; overemphasis on productivity hindering more qualified training; insufficient preparation for teaching(24)
Gender bias and challenges persisting in an academic career(28)
Gaps in education and curriculum; deficiencies in the program; advisor's direction differing from the student's proposed research; need for innovation(30)
Administrative obstacles; access to human support, colleagues, informed supervisors, and specialized resources(31)
Evaluation strategies used; superficial presentation of research methodology(32)
Challenges related to the research process(33)
Absent, apathetic, uninterested advisors(34)
Demands; coursework; lack of recognition by the advisor(35)
Exams and graduate program activities(36)
Hostile treatment by peers; fear of evaluation; transitioning between programs (pre-clinical and research training); lack of belonging to the research community(37)
Need for continuous support; COVID-19 pandemic(38)
High performance demands; constant need to seek permission from the advisor; lack of awareness regarding informational strategies offered by the graduate program(41)
Professional challenges
Balancing graduate studies with work(23,27,36,39,41)
Difficulty integrating clinical and research careers(20,37)
Administrative routines; need for organizational support at work(20)
Concern that learning may not lead to changes in care practices(21)
Low return on investment; limited opportunities for an academic career in the professional sphere(22)
Lack of time to complete the program(23)
Hopelessness regarding the contribution of graduate studies to workplace service and lack of support at work; discouragement toward the program within the work context and with supervisors(25)
Uncertainties arising from career planning changes; common language barriers with clinicians(30)
Devaluation of the degree within the organization; need to improve university-hospital cooperation utilizing this qualification by organizations; graduate studies perceived as a threat by supervisors and colleagues(33)
Difficulties in forming a professional identity(37)
Difficulty transitioning from student to employee(38)
Career advancement difficulties, status and/or salary; lack of opportunities to utilize skills developed during graduate studies(39)
Lack of opportunities, coupled with low visibility and recognition of programs within healthcare organizations; absence of assigned tasks; lack of suitable positions, poor professional integration(40)
Social challenges
Prestige loss(19)
Lack of societal recognition and appreciation(33,39)

Discussion

This review enabled the synthesis of potentialities and challenges from the perspective of graduate students/alumni of *stricto sensu* graduate programs in the health field. This approach allowed for a comprehensive description considering participants' experiences within the graduate education context. Two main categories were developed: potentialities and challenges, subdivided into common subcategories encompassing personal, academic, professional, and social potentialities/challenges. Based on the findings of this meta-synthesis, it can be inferred that *stricto sensu* graduate programs in health present a rich landscape of possibilities while also facing obstacles that impact this journey and need to be overcome.

Regarding academic potentialities, Higher Education Institutions (HEIs) substantially contribute to knowledge advancement and addressing socioeconomic challenges faced by society.(42) Within the graduate education context, master's and doctoral training provides intellectual development that can serve educational institutions while also contributing a skilled workforce for societal and economic development.(43) In academia, scientific productivity is essential for ensuring stability and promoting progress in the field. In this sense, graduate programs play a crucial role by significantly contributing to academic performance and advancing scientific productivity,(44) benefiting society and promoting academic and personal skill development.(45) To effectively train human resources for the healthcare system, it is essential to equip students with appropriate teaching and evaluation methods, as well as develop necessary competencies for educational planning and assessment.(46) This training process presents professional potentialities including career enhancement and improved professional practice,(3) as also highlighted in the findings of this meta-synthesis. A study from the USA with plastic surgeons revealed that these professionals pursue advanced degrees to enable scientific development. For these professionals, a master's degree is associated with greater academic activity, research funding, career development, publications, citations, and leadership positions.(47)

Thus, motivations for pursuing graduate studies include financial stability, prestige, work-life balance, and the development of critical thinking skills.(48) Such skills reinforce the personal, academic, professional, and social potentialities that are developed during the *stricto sensu* graduate training process. In this regard, it is worth noting that graduate students' perceptions of the training process are essential elements for evaluating the quality of education at this academic level,(49) particularly through a qualitative approach. In this direction, graduate programs that provide effective guidance and financial support can produce well-prepared researchers, capable of taking on leadership roles and postdoctoral positions. In the health field, specifically in nursing, research enables solutions for clinical contexts, including new strategies and models of patient care. Thus, nurses with doctorates can also prepare the next generation of professionals through academic leadership and as members of faculty and mentors in course curricula,(50) expanding career opportunities as verified in the professional potentialities.

According to a Dutch study conducted with 391 PhD candidates, although most participants experienced fair, open, integral, reliable, and freedom-promoting evaluation processes in their research environments, many reported facing challenges such as lack of time and support, insufficient supervision, and witnessing questionable research practices.(51) Regarding academic challenges, questionable authorship practices prevail among early-career researchers and seem to be reinforced by coercive power dynamics and dominant norms in some research cultures, particularly in natural, technical, and medical sciences.(52) A Brazilian study conducted

with 38 master's students and 35 doctoral candidates in the health field showed that the relationship with the supervisor can be dual, depending on the profile and conduct of this professional. Thus, when the supervisor effectively fulfills their role, they guide the student in conducting research and navigating the graduate program, showing empathy, addressing intellectual and socio-emotional dimensions, and serving as a career role model. However, supervisors with obstructive behaviors, such as hierarchical relationships, communication difficulties, neglect in supervision, and resistance to building rapport, impact the student's academic-professional development and the execution of research.(53)
Similar to the results of this study, U.S.-based research involving 568 doctoral students from 53 nursing schools revealed that barriers faced by students are centered on faculty-related issues, time management, insufficient preparation for dissertation research, financial barriers, and the impact of COVID-19.(54) During the COVID-19 pandemic, graduate students faced an increased risk of mental health problems,(55) becoming a challenge as presented in the results of this meta-synthesis. Students were particularly affected by changes in daily life due to lockdowns, travel restrictions, remote teaching, financial difficulties, and reduced social interactions.(56) Additionally, excessive workload, along with physical and mental exhaustion, can develop or exacerbate disorders among graduate students in the health field. Thus, the poor mental health of graduate students has become increasingly concerning, representing a personal challenge that reverberates in academic, professional, and social spheres.(57) In this direction, a Chinese study unveiled that academic stressors relate to high supervisor expectations, the need for self-discipline, peer comparison in academia, difficulties in changing research directions/academic disciplines, uncertainties about future careers, language barriers, challenges in living in another city/country, and limited social interaction with others.(58) Thus, various personal and family demands and responsibilities are evident—personal challenges may also be related to professional ones, such as the need to balance work with coursework, often without organizational encouragement or support. Many organizations underestimate doctorates in clinical settings, resulting in the loss of PhD holders from clinical practice to academic environments.(39) Therefore, there is a need for continuous efforts toward research cultures and infrastructures with appropriate career paths and positions for PhD professionals in healthcare organizations.(59) As Cassiano and colleagues(57) explain, regarding social challenges, the lack of societal recognition of the degree and research development impacts the motivation of health field graduate students, especially since society often does not understand what graduate studies entail. According to Caldas' reflections,(60) the activities performed by graduate students in higher education deserve to be valued and recognized as genuine work, especially given their intense productivity and dedication. The experience during graduate studies is characterized by ambivalence, as also shown in our study, where students report facing severe challenges at physical, emotional, and relational levels, but at the same time, recognize that this environment can be a source of growth, maturity, and happiness. This duality of feelings shows that graduate students experience both sadness and uncertainty, as well as satisfaction and joy during their academic journey.(60) This suggests that the graduate journey is full of personal, academic, professional, and social challenges, but also moments of overcoming, achievements, and rewards that enrich the experience and represent potentialities in the personal, academic, professional, and social domains of students.

By recognizing this complexity of challenges faced by graduate students, it is possible to improve the support and monitoring provided by educational institutions, aiming to create a healthier and more welcoming environment. Furthermore, it is important to value the achievements and efforts of these students, recognizing them as an essential part of scientific knowledge construction and society as a whole. A limitation of this study is the language criterion, as only studies in Portuguese, English, and Spanish were included. Few studies using qualitative theoretical-methodological frameworks were identified. However, as strengths, the extensive 20-year period used for article recruitment should be considered. Moreover, the findings encompassed 11 different countries worldwide, enabling the extension of these discoveries and synthesizing knowledge from a global perspective.

Conclusion. The analysis from this meta-synthesis allows us to conclude that *stricto sensu* graduate programs in the health field have potentialities such as knowledge acquisition, scientific advancement, career opportunities, and social contribution, but also face challenges like emotional vulnerabilities, difficulties in balancing and managing time, and lack of integration with services. The knowledge produced proves useful for understanding the strengths and challenges of *stricto sensu* graduate programs in the health field, offering a worldwide, comprehensive, and in-depth view of the current research landscape in this area. It is therefore important to strengthen these potentialities and mitigate the challenges, especially through institutional support. It is important that training centers create and manage strategies to help graduate students address, especially, the challenges present in this process. Moreover, it is pertinent to conduct further investigations on the topic, highlighting qualitative studies that allow for an understanding of subjectivities in this context.

We suggest, for future studies, the development of additional qualitative research on the topic, expanding to other participants in this academic field and other graduate areas beyond health, as well as utilizing appropriate qualitative theoretical-methodological frameworks for each study. By understanding the perspectives and perceptions of those involved, it is possible to enhance academic training strategies, encourage scientific excellence, and provide a more favorable environment for the personal, academic, professional, and social development of *stricto sensu* graduate students.

Funding and Acknowledgments: The research received funding through a doctoral scholarship granted by the National Council for Scientific and Technological Development – CNPq, process no. 141196/2022-0, Brazil.
Coordination for the Improvement of Higher Level Personnel (*Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*, CAPES), Brasil. Funding Code 001

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News

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The journal *Investigación y Educación en Enfermería* receives the Family and Community Nursing Chair Award for “Recognition of the Scientific Development of Family and Community Nursing” from Universidad de Alicante in Spain

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How to cite this article: Martínez-Riera JR, Rodríguez-Gázquez MA. The journal *Investigación y Educación en Enfermería* receives the Family and Community Nursing Chair Award for “Recognition of the Scientific Development of Family and Community Nursing” from Universidad de Alicante in Spain. Investigación y Educación en Enfermería. 2025; 43(1):e17.

DOI: https://doi.org/10.17533/udea.iee.v43n1e17

Last 13 December 2024 the awards ceremony for the Chair of Family and Community Nursing was held by Universidad de Alicante (Spain). This organization's director, Doctor José Ramón Martínez-Riera, addressed the following words to the public when recognizing the journal *Investigación y Educación en Enfermería* for its support to the scientific development of family and community nursing:

"The stimulus, support, and implication of organizations or institutions and those who represent them, are essential for the development and consolidation of Nursing through the dissemination of its research, projects, or experiences. As a scientific discipline, Nursing requires the contribution and dissemination and projection of its findings to both the scientific community and society at large. Beyond the researchers and the academic institutions or the scientific societies to which they belong, there are the scientific publications that, with the effort, perseverance, will, and attitude of those who direct and promote them can survive within a complex competitive environment, not always fair, of market and business, placing the criteria of quality, excellence, and contribution to Nursing above the business it represents for others. This is the case of the journal *Investigación y Educación en Enfermería* from the Faculty of Nursing at Universidad de Antioquia in Medellín, Colombia and in a very special way of the person who has been and continues to be the architect of its development. Dr. María de los Ángeles Rodríguez-Gázquez has been one of the pioneers in constituting a publication of these characteristics as a reference for nursing science and for this reason, the Chair of Family and Community Nursing wishes to recognize the journal *Investigación y Educación en Enfermería*."

After these words, a video was presented with the communication by the Journal's Editor, which stated:

"I am María de los Ángeles Rodríguez, for 15 years I have had the honor of being the editor of the journal Investigación y Educación en Enfermería of the Faculty of Nursing at Universidad de Antioquia in Colombia, which has been one of the biggest academic challenges in my life that implies the effort of maintaining and improving a journal's high quality, which when I received it was already known throughout Iberian America.

Together with the Editorial Committee, we have worked strenuously to improve the dissemination of the knowledge contained in our pages to be accessible globally. Currently, eight of every ten articles are from outside Colombia, with significant contribution from Latin America and a large increase of manuscripts received from countries in Europe, Asia, and Oceania. In all the articles, it is evident that the methods nurses use to provide care to people around the world are similar.

We have also improved our journal's visibility in high-impact bibliographic databases, and we are indexed in Medline, in PubMed Central, as well as in the WoS JCR citation databases in the 3rd quartile and Scopus SCImago Journal Rank in the 2nd quartile, which is the result of our commitment to editorial work of excellence, besides the new challenges of digital translation and alignment with open science policies so that nursing knowledge is shared with everyone.

On behalf of the Editorial Committee members, the authors, reviewers, readers, and as editor of the IEE journal, I thank the Chair of Family and Community Nursing at Universidad de Alicante for the honor of receiving the *Recognition to the scientific development of family and community nursing*.

Thank you very much"