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40 años

Divulgando el conocimiento

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Editorial

Invisibility and devaluation of nursing work: related factors and coping strategies

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Nursing represents the largest professional category in the health field worldwide, with 27.9 million professionals, representing 59% of the entire health workforce.(1) The World Health Organization has warned of the need for greater investments in training, better working conditions and encouraging the development of nursing leadership as one of the means to achieve universal health coverage and the Sustainable Development Goals (SDGs).(1) However, even though they are essential to health systems, these professionals face problems related to the representation of their image, which contributes to a scenario of devaluation, which has proved to be an obstacle to the development of the profession. Thus, in an exercise of understanding this phenomenon, it is considered that the factors that follow contribute greatly to configure the devaluation scenario.

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Professionals with weak professional identity and limited knowledge about their work process

The professional identity of nurses is built from several elements, including what society thinks and expresses about them, in terms of their care, educational, scientific, social and political function.[2] Studies have shown that nurses have little clarity about what they do, a fact that, added to the context of increasing precariousness of work, can deepen frustration and little identity with the profession.[3] There are discussions about the need to overcome vague definitions in nursing, as they do not bring the elements that allow differentiating the doing of nurses from the doing of other professionals, which may explain the fact that many nurses are unable to express a definition of nursing, or systematize what their attributions are, and there is an urgent need for clearer concepts that in fact allow nurses to recognize the attributes that distinguish the profession from others.[3]

Complex work, but unnoticed: incomprehension and invisibility of nursing work

People have only a superficial understanding of the nurse's work, built from what they perceive in the services or have access to in news or film productions, and it is necessary that we promote, from education about what we do, the evolution of understanding to knowledge about our work. Because it is a complex work but little apparent, society tries to understand the nursing work by associating it with what it already knows about health work. Often, this prior knowledge is related to the physician's work, because his work is more consolidated in the social ideal. Perhaps, therefore, the activities that most characterize the work of nursing for society are almost always related to the physician: administration of drugs prescribed by the physician, the physician's assistant, think that nurses have less knowledge and consider that nurses are subordinate to these professionals.

In an attempt to understand this work, it is common that they also associate it with lay care, since feeding, bathing, dressing, changing clothes and sheets are also nursing activities. However, we need to explain that while they look the same, they are very different activities. For example, the way to feed a patient by a nursing professional involves complex knowledge and skills, as we have to consider the consistency of the food, assess the ability to swallow, choose the optimal position, and observe risks and signs of broncho aspiration, possible gastrointestinal reactions and acceptance. The complexity of care may go unnoticed if the professional does not explain to the patient, caregivers and family all the knowledge and skills involved in these activities. Thus, for society to evolve from vague understanding to knowledge about what we do, it will need our mediation.

Another aspect to be considered is the fact that caring has historically been considered women's work. In this sense, in a still patriarchal society, the lower hierarchical order of society associated with care work continues to perpetuate the social oppression of caregivers who, traditionally, were not paid and, also because of this, related to low socioeconomic status,[4] developing an essential work, but which ends up being invisible due to its status in society. Nurses need to explore alternative ways of communicating the contributions of their role and the impact on health outcomes and quality of life, as well as making the profession more visible and explicit.[5]

Misconceptions and stereotypes about work and nursing professionals

Society's lack of knowledge about nursing practice and the consequent invisibility of its work is related to distorted and stereotyped images of these professionals. The inaccurate and distorted images of nursing limit its public understanding, preventing us from being seen as well-informed and qualified health professionals, because, due to the complexity of our work, not all activities are

apparent, requiring resources that can help them create a positive image from what we really do and are: leaders, administrators and professionals who provide care with resoluteness and essential to all health systems.

We observed few strategies to confront stereotypes in the media about nursing, the most frequent being those of heroin, angel, prostitute, seductive woman or servant,[5] stereotypes repeatedly represented in films and series, feeding the social ideology with mistaken impressions. Even understanding as angels and heroes also does not help in creating an image close to reality, as it creates a perception that skill and knowledge are not so important, believing that the skills to be a good professional are somehow innate or conferred on us and not acquired by study and training, attributing us superhuman characteristics,[5] which does not benefit us, because both superheroes and angels do not die, they also do not require training or a salary compatible with their attributions; unlike nursing professionals. The weak professional identity added to the difficulty of understanding our work creates a vacuum that is configured as a space for building different ideas, being a fertile field for the establishment of stereotypes. Thus, the more apparent, understandable and clear the nursing work, the less room there will be for this type of construction.

The social devaluation

The repercussion of all aspects discussed so far (weak professional identity, ill-defined contours of the profession, invisibility and stereotypes) contribute to the social devaluation of work, contributing to little recognition and prestige and, also for this reason, professional dissatisfaction. A review, with the objective of describing the perception of young people about the work of nursing, identified that the participants relate it to precarious working conditions and limited autonomy, and this work is seen mainly as caring for and helping patients and was considered inferior to the work of the physician. Young people did not mention the knowledge and training of professionals and pointed out the social status of nursing as low.[6]

The low valuation of nurses is reflected in poor working conditions, in the absence of decent salaries, in the lack of an adequate weekly workload compatible with the complexity of this activity, in the inadequacy of places for rest and food in many institutions, low electoral success for those who are willing to try positions in party politics[7] and in the underrepresentation of this group in decision-making spaces.

Proposing coping strategies

Recognizing what we do and communicating this to patients is the first step. Society needs to recognize that we develop a different work process from other health professionals, as we are the only professionals who simultaneously: (1) lead people, as we coordinate the work process of nursing assistants and technicians; (2) manage material resources and care processes, as we monitor all therapeutic interventions performed on the patient, which allows us to say that our work directs the work process of other professionals; (3) and provide care on a readiness (when activated) and wakefulness basis (24 hours at the bedside), anchored in dense scientific knowledge.

During interventions with patients, it is important that nurses use the proper language of nursing, such as nursing diagnoses, interventions and results, to show the scientificity involved in this practice, also causing the patients to distance our care, scientific and professional, from lay care, as well as from the care of other team members. In order to communicate to society about what we do, the use of virtual social networks can constitute a powerful strategy for the dissemination of a more positive and closer image of reality, changing the social idea about the profession.

With regard to society's impression of an alleged subalternity to the figure of the physician, it is necessary that we recognize expressions that contribute to validate these mistaken impressions

and avoid them. Expressions such as: “you will talk to the physician, because I am only the nurse”, as if the nurse’s work had little importance in the health production process; “you will be good soon, because the physician will attend you”, reinforcing an idea that the cure depends only on a single professional; “good morning, you will be attended by me, the nurse, and the physician”, the expression physician, irretrievably, creates an idea of superiority and hierarchy[8] in relation to the nurse, configuring a situation of symbolic violence, and it is important to avoid it.

Knowing and reflecting more about what we do is a structuring step to overcome this reality, communicating this to society, as it is not possible to value what is not known or is invisible. This change depends on what each nurse does on a daily basis, on how they communicate with their patients, companions, caregivers and family members in the various practice scenarios.

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Methodological article

Assessing and Achieving Quality in Qualitative Research: Clues for Researchers in Training*

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Assessing and Achieving Quality in Qualitative Research: Clues for Researchers in Training

Abstract

This article deals with the particularities of the quality of qualitative research, under the double lens of valuing it and ensuring it. While achieving the quality of qualitative research concerns only those who have opted for this methodology, assessing it is everyone's business because researchers in training will encounter, in the literature reviews, qualitative studies on which they must reflect and estimate their quality. Appreciating the quality of a research work is a complex activity as it is situated within a context and conducted by individuals who use any of the means available to do so. The means they use are criteria as evaluation guides and criteria checklists. For researchers in training, I suggest some guiding criteria to evaluate qualitative publications and ensure quality during the research process, key issues that they must address.

* This article is based on the conference presented in the 16th meeting of doctoral students in nursing sciences on the occasion of the opening of the 2023-2024 academic year. Universidad de Oporto, Portugal.

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Descriptors: health research evaluation; research; nursing research; qualitative research; quality control.

Valorar y lograr la calidad de la investigación cualitativa: claves para investigadores en formación

Resumen

Este artículo trata sobre las particularidades de la calidad de la investigación cualitativa, bajo la doble lente de valorarla y asegurarla. Mientras que alcanzar la calidad de una investigación cualitativa atañe solo a los que han optado por esta metodología, valorarla es asunto de todos, ya que los investigadores en formación se encontrarán en las revisiones bibliográficas con estudios cualitativos sobre los cuales deberán reflexionar y estimar su calidad. Apreciar la calidad de un trabajo de investigación es una actividad compleja ya que está situada en un contexto y llevada a cabo por personas que usan alguno de los medios disponibles para hacerlo. Los medios que usan son los criterios como guías de evaluación y los listados de verificación de criterios. Para los investigadores en formación sugiero unos criterios guía para la valoración de publicaciones cualitativas y para asegurar la calidad durante el proceso de investigación, unas cuestiones claves a las que deben atender.

Descriptores: control de calidad; evaluación de la investigación en salud; investigación; investigación cualitativa; investigación en enfermería.

Avaliar e alcançar a qualidade da pesquisa qualitativa: chaves para pesquisadores em formação

Resumo

Este artigo trata das particularidades da qualidade da pesquisa qualitativa, sob a dupla lente de valorizá-la e garanti-la. Embora alcançar a qualidade da pesquisa qualitativa seja do interesse de quem optou por esta metodologia, Avaliar é tarefa de todos, pois os pesquisadores em formação se encontrarão em revisões bibliográficas com estudos qualitativos, sobre os quais deverão refletir e estimar sua qualidade. Avaliar a qualidade de um trabalho de investigação é uma atividade complexa, pois está situada num context e é realizada por pessoas que utilizam qualquer um dos meios disponíveis para o fazer. Os meios que utilizam são critérios como guias de avaliação e listas de verificação de critérios. Aos pesquisadores em formação, sugiro alguns critérios norteadores para avaliar publicações qualitativas e para garantir a qualidade durante o processo de pesquisa, questões chaves que devem ser abordadas.

Descritores: avaliação da pesquisa em saúde; controle de qualidade; pesquisa qualitativa; pesquisa; pesquisa em enfermagem.

Introduction

Research is the backbone of a PhD program and, in many cases, master's programs; its quality is something that concerns us all, professors, directors of thesis or master's thesis and students, given that the advancement of knowledge and the success of researcher training depends on it. While achieving quality of qualitative research concerns only those who have opted for this methodology, evaluating it is a matter of all researchers in training, given that in literature reviews they will find qualitative studies about which they must reflect and estimate their quality. Today, it is expected that, theoretical frameworks or literature reviews and the justification of any study to include qualitative knowledge, given that if not done, the work will be incomplete. What is worse, in the case of quantitative studies, there will be no evidence that highlights the relevance of the research question, or which permits designing a measurement instrument according with the reality of the individuals; likewise, in intervention studies, qualitative knowledge provides essential information about the context in which said intervention will be implemented. Hence, this article deals with the particularities of the quality of qualitative research, under the double lens of evaluating and achieving it.

To favor comprehending this work, the first thing I propose is that the appreciation of the quality of a study is subject to the paradigm on which said study is based. Thereafter, I explain that evaluating quality is a subjective activity situated within a context, given that it is carried out by people and not by instruments. In the appreciation of quality, I will focus on aspects researchers in training must look for and know how to appreciate. I will conclude by addressing those who are starting a qualitative study or are already undertaking one, and will propose the need to ensure quality during the research process itself. I have written about quality,[1] now I center my attention on the key issues of its evaluation and achievement.

The paradigm

I believe nobody is alien to the idea of paradigm, which is usually understood as a revolution in the way of thinking about something that leads to changes. In effect, one of the best definitions I know of paradigm is that which explains it as a set of beliefs that guide action.[2] In research, these beliefs are based on a group of interconnected assumptions: the ontological, relating to what is believed about reality; the epistemological, about the relationship between the research and that which can be known; and the methodological, which refer to beliefs about how knowledge is obtained about the world. The paradigm defines for researchers that which they deal with, that is, legitimizes the research question and defines their task; that is, how they should act and the procedures they should use.[2] Hence, quality assessment is a paradigmatic issue and not a methodological or technical one. What is relevant is the perspective of the person evaluating; from this perspective, the evaluation

criteria will emerge together with instruments that will be used and how these will be used.

To prevent projects and qualitative studies from being judged with positivist criteria, in the 1980s Lincoln and Guba, in their text Naturalistic Inquiry,[3] developed, among other seminal works, vocabulary and quality concepts of qualitative research. When I read this book for the first time, it seemed difficult to understand each concept; nevertheless, I was grateful that they had written it because it reaffirmed to me during my training as a researcher that what I was doing was scientific, although a different type of science. These authors explained that the validity of a qualitative study is achieved with confidence or trustworthiness and that for this the work, among other things, had to be credible, both in the methodological aspect and in its results. A language and concepts had been born to assess qualitative research. Years later, in an effort to strengthen scientific recognition, authors such as Tina Koch propose the equivalence of the concepts included in the criterion of trustworthiness with positivist criteria.[4] For example, credibility was equated with internal validity and transferability was equated with external validity. This marked a milestone because it set the rigor of qualitative research on par with that of quantitative research, so that we were different among peers.

Since then, much has been written and published about quality. This theme of constant interest in methodological development has not been free of debates and tensions.[1,5] We could say that at the beginning attention centered on developing our own quality criteria and then taking care of promoting the quality of the research to be included in methodology manuals and, lastly, on developing means to assess it, coinciding with the movement of the evidence-based practice, with the expansion of publications of qualitative studies and with the growing need to conduct qualitative systematic reviews or meta-synthesis.

The fact is that qualitative studies must be as rigorous as any research, and it must be taken into account that they have their own well-consolidated parameters. If researchers do not take this into account and expect, for example, for the results to be objective and extrapolatable, In addition to being unfair, their evaluation will possibly be wrong and taking as good what is not or ignoring what is valuable because it does not meet inappropriate standards. The evaluation is a challenging activity, especially because it is very easy to see defects in a work or to fall into purist and unempathetic positions that prevent recognizing the good and the meritorious.

It is true that, from that published about a topic, we can find marvelous studies that open doors for us to strengthen knowledge and others of little value. Thus, Sandelowski and Barroso,[6] in the systematic review on HIV and AIDS, found that qualitative publications could range from not being research due to not having results, to being confused with qualitative research due to presenting quantified and not described results. According to these authors, true qualitative studies, in turn, could have different conceptual levels, thus, from lowest to highest they found: the exploratory ones that were basically limited to stating the identified themes; the descriptive ones that developed them; and the explanatory ones that established new relationships among these themes. This range is determined by the conceptual proximity of the results with respect to the data, that is, the depth of the analysis. This already makes clear the need to assess the evidence, regardless of how challenging it may seem, especially when building the theoretical argument of our research. But what does this process entail? I will explain it ahead.

The complexity of evaluating qualitative research

Evaluating a qualitative study is a complex activity because it implies diverse interconnected elements: the research report, the evaluation context, the person evaluating, and the means to do so. Each of these aspects will be explained. The document evaluated is a text created with

a particular purpose and always with the aim of producing an impression. Sandelowski[7] already indicated that research reports, whether theses or articles, are not minutes of what occurred, but the artifacts constructed. So, what we evaluate is a version and – generally incomplete – of what took place. Limits exist about what can be stated, written, and – of course – there are word limits. Due to such, when evaluating a work, if we notice any void, or a given canon is not complied, we should not assume it as a failure; first, we will think that it was not included in the report and we will decide the importance of this omission, we will also reflect on whether the canon not met has to do with other things, like the level of analysis presented or that quite simply the precept is for angels and not for human researchers. A reviewer of a manuscript I submitted some time ago for publication noted that the categories were not saturated as the manuals of the time indicated. The observation was correct to a certain point, given that the saturation of a category in practice is not an absolute term; the reviewer did not take this into account when strictly adhering to the definition of the concept to the letter.

This anecdote brings us to the second issue, which states that the evaluation does not take place in a void, but within a context that will grant it sense. Thus, for the proposal of a research project, we will assess qualitative articles to develop an argument that will support the project, seeking sound and convincing evidence on the study topic. In the area of health, extensive documentation is available on the subjective experience of complex health-disease processes, on complications in the development and implementation of health services or interventions, and on expert knowledge in practice.[8] We have high-quality qualitative theory that must be used; notable for its current relevance is the wealth of qualitative knowledge on chronicity and dependence pioneered by Charmaz.[9,10]

Currently, unlike other times, the amount of information available and accessible contrasts broadly with the difficulty present prior to being able to access such, particularly to qualitative studies that were not many and were disperse. I recall that during my PhD formation I travelled by train to another city to consult the collections of its university library and more than once returned empty-handed. Yes, I also wonder, how did we live without the internet? Most likely, in a few years we will ask ourselves how we survived without artificial intelligence!

Today, everything is connected and much is published, so search engines in databases can yield hundreds of references that we must screen for information to be manageable. In that respect, I only wish to state that establishing a date of publication as limit, such as the last five years, to retrieve works about our topic of interest, in the case of qualitative studies, should not be used exclusively, given that good qualitative evidence transcends time, that is, it does not expire. For example, if I am conducting a literature review for a study about palliative care and ignore the work of over 40 years by Quint Benoliel[11] about caring for a dying patient I am losing valuable information. Interpretive evidence accumulates in a connected and non-hierarchical way.

Upon retrieving information, we must discern that with the highest quality and relevance for the research we propose. In addition, given that in the area of health, disciplines, like nursing, are practiced, we must not lose sight of the practice context and must ask ourselves for the potential of the works we are evaluating to improve it. Herein, the assessment context will be academic and clinical. Besides being an activity situated within a context, the evaluation is subjective, eruditely subjective we could say. Those of us who evaluate have a certain training and methodological tastes that influence on the evaluation process,[12] thereby, this requires that we keep in mind our preferences during the evaluation.[7] Evaluating is, thus, a matter of passing judgment mediated by our subjective appreciation.[1] At this point, it is clear that those of us who evaluate must, at least, be familiar with qualitative methodology besides

being fair in our judgment: we should distinguish between significant errors and those that are not.[7] Appreciation is, therein, based on experience and on methodological knowledge.

It is true that different evaluators can have different appreciations of the same work, and this has happened to many of us with the evaluation of manuscripts for publication. Aside from the confusion that this may cause, the issue in evaluation is not unanimous opinion, rather that assessments are informed and well-supported. Evidently, much of science is about persuasion, of convincing with logical and documented arguments.

Here, I must refer to the means to assess the quality of a qualitative report. Basically, two are used: criteria used as guide and criteria contained in checklists. Although general agreement exists on a study's quality criteria, not all authors assign the same importance to each criterion, nor are all criteria included in the checklists. In addition, there are authors – who taking the pioneering work by Guba and Lincoln – introduce criteria of general application to any work, such as veracity or trustworthiness, transferability, congruence, and transparency,[13] while others do so according to the research method – distinguishing, for example, the evaluation of a phenomenological study from an ethnographic one.[14]

Regarding the second evaluation means, there are closed checklists, and I wish to indicate that there are many, including the: Consolidated criteria for reporting qualitative research **(**COREQ),[15] frequently used for publication in nursing journals, which has 32 items grouped into three domains: the research team, the study design, and the findings. Also, among those designed for the critical reading of qualitative studies within the evidence-based practice movement, there is the Critical Appraisal Skills Program Spain (CASPe) grid[16] with 10 items and centered on the study results estimating their validity and applicability to the practice. These lists are useful for people with basic or introductory training in qualitative research, given that they contain quality criteria indicators and where they can be found in a text. However, because no consensus exists on the criteria that checklists should include, how to apply cut-off points and how to judge whether a study has met a standard,[17] the quality judgment is in the hands of the person evaluating the work and using a given list. Thus, the importance of the evaluator in determining the quality of a study is again highlighted. While using criteria requires evaluators to have greater experience and knowledge than checklists, they also require understanding and knowledge of qualitative research.

In evaluating quality, as already seen, expert opinion comes into play and I base myself on it then, considering the training context of novice researchers, suggesting criteria as a guide.

Criteria to evaluate quality within the formative context

The criteria I propose are some related to the product and others related to the research process (Table 1). My intention is not to add to what has been published, but to highlight that which I consider essential and, as a key, to keep novice evaluators from getting lost in the details and from being able to distinguish and appreciate what is relevant.

Table 1. Clues for quality of qualitative research

Assess Quality		Achieve Quality
Result criteria	**Process criteria**	**Central issues**
Evocative	Credibility	Interior point of view
Substantive relevance	Methodological/method coherence	Reflexivity
Credibility	Based on data	Time management

First, the criteria regarding the product. Considering the context of a research project in the area of health, a qualitative study must be *evocative* so that its results tie us with cases, experiences and situations of practice. Here, the evaluative vision is that of the clinicians, for whom the evocation resonates in their experience, in such a way that they achieve a more sophisticated or deeper understanding related to the practice. Hence, if upon consulting a work, this reaches us or impacts us, it is a sign of quality. The qualitative evidence of quality does not leave anyone who reads it indifferent, it moves and clarifies. For example, in the findings of a study of people with chronic kidney disease we concluded:[18]

> Chronic kidney disease and its treatment alters the feeling of who one is and what one who suffers from it can do. For people with chronic kidney disease *nothing is no longer like before* nor *are they who they were before*. The disease has disrupted their lives. However, they struggle to lead a life worth living in which the life provided by treatment is compatible with social, family, emotional and work life.

Besides being evocative, the study must contribute to what is known about the topic; due to such, we will value its *substantive relevance*, this means that we will examine the essential and the revealing that it contributes to what is already known about the topic. We will know how to recognize this because the work itself will indicate, in the discussion of the findings, what it adds to what is already known and, as informed readers on the subject, we will value it. If, on the contrary, the study indicates that it coincides with that presented in prior works, this is simply a verification or reiteration of what is known.

A qualitative study must not only move, but also convince, so we will weigh its *credibility*, which is both for its findings and for the research process itself. Thus, we will estimate whether that proposed is plausible given the knowledge on the subject and if it is reasonable given the circumstances in which the study was conducted, such as its duration.[19] In reality, qualitative studies take time, require prolonged periods of time in the field and unaltered analysis. Evaluation requires our distinguishing those reports that state that they did everything that had to be done, but without showing evidence of what they did.[7] A case may be that it is reported that unstructured or semi-structured interviews were carried out and the interview guide presented contains many questions and/or that these are closed questions.

After this first filter focused on the research product, there are, in my opinion, the questions of the process, those that deal with evaluating the aspects related to how it was carried out. In this evaluation we must be cautious because, I know from experience, that many times aspects of the description of the method or methodology are sacrificed due to the word limits imposed by journals. Thus, some credibility aspect in the process may be threatened by these restrictions. For example, a study states that data collection was concurrent with the analysis and then does not show any indicator of this, such as that data collection was done in a staggered manner. In this case, as already indicated, the evaluator must

weigh the importance of this omission within the work's overall context. Regarding the process, besides credibility, the most important thing to assess is its *methodological coherence* or the method used. For example, that the objectives and the question coincide with the method chosen and this coincides with the data collection and analysis procedures. Likewise, we will verify that what is stated is *based on data*, that is, that the data analysis was inductive. To do this, the report must contain live data that clearly illustrate the concepts: when reading the live data, it immediately takes us to the concept.

Achieving the quality of the qualitative study

Although the qualitative methodology manuals and the criteria by which a work will be evaluated tell us in detail how we should do it, in this last part I would like to refer to three central issues that I must address as a researcher to achieve the quality of my study (Table 1). These are, to my understanding key, that will maintain the course of quality in the study, that will give meaning to what we do, avoiding ritualistic practices and, most importantly, will allow us to persevere the essence of qualitative research: that which appreciates the details and transmits universals.

The first issue I propose is that of staying in the other's point of view, or *emic* point of view. Qualitative research is necessarily partial, It is concerned with showing things as they are from within, from the perspective of the person who lives or experiences them. Goffman, in the work on psychiatric patients, indicated that this is partiality essential to faithfully describe a situation, although adding that of being "exempted" from it as a matter of balance because almost everything written at the time about mental patients was done from the psychiatrist's point of view.[20] With this explanation, Goffman aims at the heart of qualitative research, at what triggers it. Following this teaching, in a study I expose:

> Thus, this study was motivated by gaps in the literature, the interest that as a nurse I have in family care, and the situation in Colombia where support for family caregivers, although necessary, is still scarce. Examining the strategies that caregivers develop in advanced stages of dementia, documenting the circumstances in which caregiving takes place and what effect this has on the course of the disease... reveals what we can and should do.[21]

Qualitative "bias" gives value to the experiences and points of view of those who live them and not of the experts who are outside such. Bearing in mind this research question and the study topic will help us remain in this vision throughout the study. A sign that we are entering the experience of the interior is when, for example, when transcribing an interview and it seems to us that it does not say anything relevant, it is likely that they do not say anything of what we expect to hear and therefore we do not recognize it. Here, it is fundamental to consider that qualitative research is about discovering and not about verifying what is already known. We will know that we have grasped the insider's point of view when the study participants tell us something like "I wouldn't have said it like that, but that's what happens" or they say "that's not my case, but it could be like that." Clearly, this is different from, for example, participants confirming that they have said what they have said in an interview, in this case we will not be entering the experience of the interior, but rather we will remain on its surface. It is the intensive and deep data analysis along with focused questions that will reveal the perspective of the interior, that is: the subjectivity of the experience.

The second issue I propose is reflexivity. This consists of being aware of the effect that the research being conducted has on oneself, and the effect it produces on the study participants themselves.[1] Here, I refer to reflexivity as researcher in training, something that has gone unnoticed in specialized bibliography. This reflexivity involves becoming aware of our expertise as beginning

researchers, which will allow us, when required, to make the necessary adjustments. For example, during my PhD formation I made the mistake of negotiating through a third party the access to a health center to start my fieldwork. This caused misunderstandings about who I was and what I sought. Those who received me confused my identity, thought I was visiting and provided me with a large amount and variety of information, much of it irrelevant to my study. In the following health centers that I went to for fieldwork, I negotiated access personally and have done so ever since. There are no misunderstandings about my identity or what I intend as a researcher, this helps me obtain relevant data for the study. Adjustments to the research process can be made, even to the research question. If we notice that such is not significant, we can change it, as illustrated in the following quote:

The question that initially guided this study was "How are women and girls handling the AIDS epidemic in Mozambique?" However, as data collection advanced, it became evident that AIDS was nothing more than an oppressive aspect of the women's lives. At that point, we needed a broader question to capture the complexity of the women's experience. Therefore, the research question evolved toward "How do women handle gender oppression in Mozambique?" [22]

Persisting with the initial question would have led to less relevant results. Adjusting contributed to its quality. Changing or accommodating the research question based on the fieldwork does not go against quality but, rather indicates that we have situated ourselves on the interior point of view. Therefore, to achieve quality we must be attentive to what we do and how we do it, keeping in mind the purpose of our study and the spirit of qualitative research.

Moreover, while conducting qualitative research, a frequent mistake is that of our preconceptions. During an interview, a student once asked a principal caretaker to tell her what she had done when she got up in the morning, to which the caretaker responded: "I wish I had gone to bed!". The good thing about mistakes like this is that they suddenly place you in the other's reality, in their experience. And this is a grand opportunity for analysis. Thus, the so-called "errors", during the course of the research are opportunities for discovery, for learning, and for improving the very research process and its procedures.[23] In fact, qualitative research has the particularity of self-correction, it develops flexibly, adjusting to contingencies or mending errors. For such, researchers in training need not only have a good methodology base, but also to recur to texts and people of reference that help them to detect and correct mistakes. Qualitative design is emergent; qualitative researchers do not act by design, but by acting as such, we design our studies, that is, we accommodate it to the contingencies and opportunities of the fieldwork, the data analysis shows us the path to follow. This way of developing design is a mark of quality.

The third and last issue to achieve the quality of the study is time management. The quality of our work may be affected by poor time management. If we have no time for reflection, to try again, to make changes and, due to lack of time, we perform a hasty analysis, a poorly prepared hurried thesis writing, this condemns the quality of the study. We must be able to reconcile research and training with our other lives, family life, social life and, in many cases, professional life. In our first studies, we underestimate the time it takes to do things, such as gaining access to the field, let alone the time it takes to think, *i.e.*, analyze the data. I wish to underscore that qualitative research has different times from those of quantitative research. For example, I advise reserving half the total time available for the study for analysis and to be quite realistic with the amount of data to obtain, given that, if we obtain more data than we can analyze, it is a waste of time; valuable time that we then have to take from somewhere else, jeopardizing the quality of our study because analysis is usually the first thing sacrificed when we lack time. Developing the schedule for a qualitative study

is an exercise in practical realism. Thereby, the best qualitative study is that which can be carried out without compromising its quality over well-planned and invested time, time that will allow us to discover and enjoy.

To conclude, evaluating a qualitative study concerns everyone; without qualitative knowledge, research projects are incomplete. Evaluation is a paradigmatic and not a methodological issue, it is an activity located within a context and carried out by informed individuals who use any of the means available to do so. Evaluating quality, therefore, consists in issuing qualified judgment and is not merely the result obtained through a measurement instrument. Similarly, achieving quality during the research process requires formative reflexivity, that in which one is aware of being in a learning process. Professors want researchers in training to be good evaluators and better builders of knowledge. I hope with these clues to make the work easier.

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Educational intervention on perceived stress among adults with type 2 diabetes and metabolic syndrome: a non-randomized clinical trial

Original Article

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Educational intervention on perceived stress among adults with type 2 diabetes and metabolic syndrome: a non-randomized clinical trial

Abstract

Objective. To assess the effectiveness of an educational intervention on perceived stress and metabolic syndrome parameters among adults with type 2 diabetes mellitus. **Method.** Fifty-one adults (aged 48.73±7.84; 86.3% of women) were included in a non-randomized clinical trial performed in a healthcare unit for six months (Brazilian Clinical Trial Registry: RBR-43K52N). All participants were diagnosed with type 2 diabetes mellitus and metabolic syndrome (intervention group, $n=26$; control group, $n=25$). The intervention consisted of a nurse-led educational health-promoting program with a multidisciplinary approach organized in seven workshops. The primary outcome was decreased perceived stress, and the secondary outcome was improvement in metabolic syndrome parameters according to perceived stress levels. These outcomes were assessed at two points in time, at the baseline and follow-up. **Results.** Participation in the intervention program resulted in a significant decrease in perceived stress ($p=0.028$). The stressed participants in the intervention group experienced a significant decrease in blood glucose levels ($p=0.001$) and a significant increase in high-density lipoprotein-cholesterol ($p=0.003$) concentrations after the six-month intervention. **Conclusion.** The nurse-led educational health-promoting program decreased perceived stress among adults with type 2 diabetes mellitus and metabolic syndrome, improving fasting blood glucose and high-density lipoprotein cholesterol among the stressed participants in the intervention group.

Descriptors: diabetes mellitus, type 2; community health nursing; stress, psychological; health promotion; metabolic syndrome.

Intervención educativa sobre el estrés percibido en adultos con diabetes tipo 2 y síndrome metabólico: ensayo clínico no aleatorizado

Resumen

Objetivo. Evaluar la efectividad de una intervención educativa sobre el estrés percibido y los componentes del síndrome metabólico en adultos con diabetes mellitus tipo 2. **Métodos.** Se incluyeron 51 adultos (48.73±7.84 años; 86.3% mujeres) de un estudio no-ensayo aleatorizado realizado en una unidad de salud durante seis meses, con Registro Brasileño de Ensayos Clínicos: RBR-43K52N, todos los participantes fueron diagnosticados con diabetes mellitus tipo 2 y síndrome metabólico (grupo intervención, $n=26$; grupo control, $n=25$). La intervención consistió en un programa educativo de promoción de la salud con enfoque multidisciplinario, liderado por una enfermera, estructurado en siete talleres grupales. El resultado primario fue la reducción del estrés percibido y el secundario, la mejora de los componentes del síndrome metabólico influenciados por el nivel de

estrés percibido, evaluado en dos momentos, al inicio y después del seguimiento. **Resultados.** La participación en el programa de intervención resultó en una reducción significativa del estrés percibido en comparación con el grupo control (p=0.028). Los participantes estresados en el grupo de intervención tuvieron, respectivamente, una disminución y un aumento significativos en las concentraciones séricas de glucosa (p=0.001) y lipoproteínas de alta densidad-colesterol (p=0.003) después de seis meses de intervención. **Conclusión.** Un programa educativo de promoción de la salud liderado por enfermeras fue eficiente para reducir el estrés percibido entre adultos con diabetes mellitus tipo 2 y síndrome metabólico, además de mejorar la glucemia en ayunas y el colesterol unido a lipoproteínas de alta densidad en los participantes del grupo estresado de intervención.

Descriptores: diabetes mellitus tipo 2; enfermería en salud comunitaria; estrés psicológico; promoción de la salud; síndrome metabólico.

Intervenção educativa sobre o estresse percebido de adultos com diabetes tipo 2 e síndrome metabólica: ensaio clínico não-randomizado

Resumo

Objetivo. Avaliar a efetividade de uma intervenção educativa sobre o estresse percebido e os componentes da síndrome metabólica em adultos com diabetes mellitus tipo 2. **Métodos.** Foram incluídos 51 adultos (48.73±7.84 anos de idade; 86.3% mulheres) em um ensaio clínico não-randomizado realizado em uma unidade de saúde durante seis meses, com Registro de Ensaio Clínico Brasileiro: RBR-43K52N.Todos os participantes apresentavam diagnóstico de diabetes mellitus 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 abordagem multidisciplinar, liderado por enfermeiro, estruturado em sete oficinas em grupo. O desfecho primário foi a redução do estresse percebido, e o secundário, a melhora dos componentes da síndrome metabólica conforme influência do nível de estresse percebido, avaliados em dois momentos, na condição basal e após o acompanhamento. **Resultados.** A participação no programa de intervenção resultou na redução significativa do estresse percebido em comparação com o grupo controle (p=0.028). Os participantes estressados do grupo intervenção tiveram, respectivamente, diminuição e aumento significativos das concentrações séricas de glicose (p=0.001) e da lipoproteína-colesterol de alta densidade (p=0.003) após seis meses de intervenção. **Conclusão.** Um programa educativo de promoção da saúde liderado por enfermeiros foi eficiente para reduzir estresse percebido entre adultos com diabetes mellitus tipo 2 e síndrome metabólica, além de causar melhora da glicemia de jejum e e da lipoproteína-colesterol de alta densidade dos participantes estressados do grupo intervenção.

Descritores: diabetes mellitus tipo 2; enfermagem em saúde comunitária; estresse psicológico; promoção da saúde; síndrome metabólica.

Introduction

The prevalence of metabolic syndrome (MS) has increased at an alarming rate, a silent epidemic considered a global public health problem. MS has often been associated with type 2 diabetes mellitus (DM2), which is also one of the most significant global emergencies. However, the determinants of both conditions are modifiable, e.g., perceived stress.[1] Perceived stress concerns the degree to which an individual perceives life experiences as stressful.[1] The imbalance produced between efforts demand and low reward in a multimorbidity context, i.e., in the presence of ≥ 2 chronic conditions, especially DM2 and MS, is considered a significant risk factor for an individual's mental health, as it results in increased psychological stress. Studies show that middle-aged individuals experiencing high-stress levels are at a greater risk of presenting MS than their counterparts experiencing low-stress levels.[2,3] A meta-analysis shows a significant association between perceived stress and abdominal obesity and lipid parameters that define MS.[4] In any case, the mechanisms behind the relationship between perceived stress and MS seem to be related to an increase in body obesity; however, such an explanation is complex and require further investigation. One of the current explanations concerns individuals' low ability to adapt to chronic stress mediated by neuroendocrine disorders, mainly due to changes in the hypothalamic-pituitary-adrenal axis, which causes an increase in catecholamines and serum cortisol levels, which, in turn, leads to a decreased appetite control and increased adiposity. As a result, individuals experience increased blood pressure, higher glucose levels, and the accumulation of circulating lipids.[5]

This syndrome comprises a set of metabolic disorders with cardiovascular risks, such as central fat deposition and insulin resistance (IR), and is associated with mortality in adults with DM2.[1] Furthermore, the number of adult individuals with DM2 and MS considerably impacts the country's health status and overall healthcare costs. Therefore, applying knowledge and skills from the different fields of knowledge, including nursing, in the planning and implementation of health-promoting programs to deal with the increased burden of chronic diseases associated with perceived stress is urgent and necessary to effectively implement health policies directed to this population and ensure adequate monitoring. It is advisable to decrease the impact of MS by reducing its incidence in the primary health care (PHC) scope, as this is the healthcare level where individuals with a high cardiometabolic risk, such as those unable to deal with stress, concentrate.[6] The chronic nature of DM2 and MS demands lifestyle changes. Hence, self-care should be encouraged, and strategies to cope with stress should be promoted among individuals within the PHC. Nonetheless, these actions remain a challenge, especially when there is also an intention to relieve the burden of psychological stress. Adopting a healthy lifestyle is essential in preventing such conditions' alarming rates. Recognizing such complexity and adopting a healthy lifestyle is essential

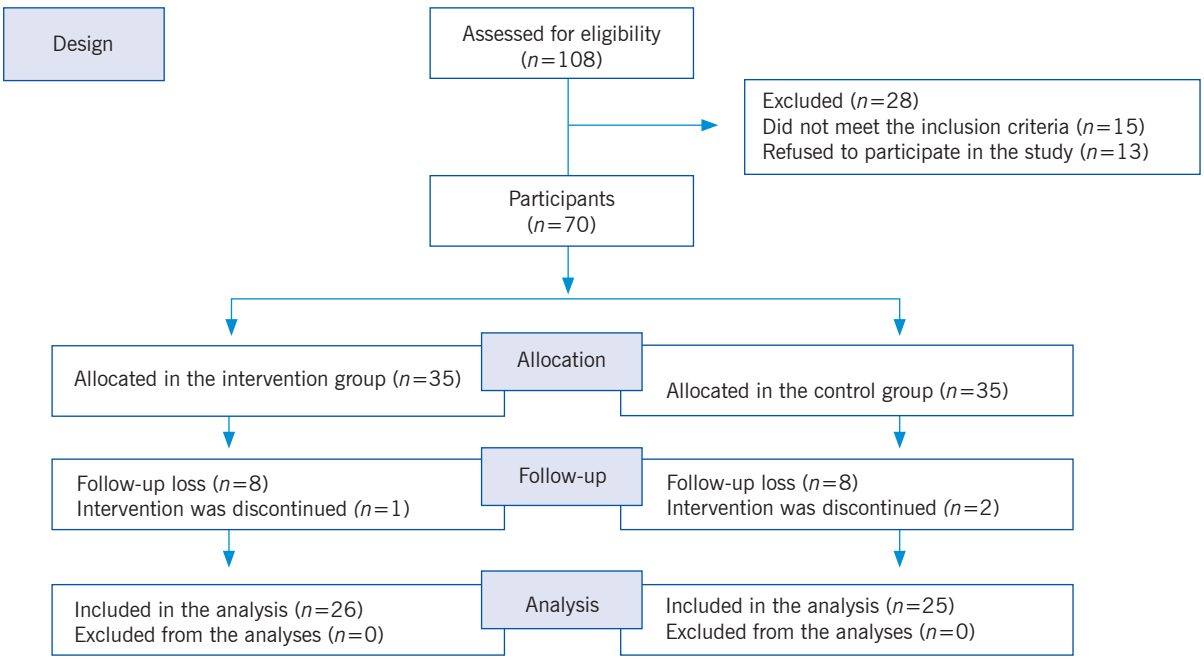
to prevent these diseases. In this context, nurses play a vital role in implementing policies and ensuring adequate monitoring and promoting the health of this vulnerable population.[1]

Although incipient, recent advancements concerning perceived stress and MS enable the investigation of these relationships. The Perceived Stress Scale (PSS) is one of the most popular subjective tools for assessing psychological stress, though only a few studies have addressed the association between perceived stress and diabetes or MS.[6,8,9] Therefore, this study aimed to assess the effectiveness of an educational intervention on perceived stress and MS parameters among adults with DM2.

Method

A two-arm non-randomized clinical trial was performed considering a six-month educational intervention registered in the Brazilian Clinical Trial Registry (REBEC) under code RBR-43K52N. This study is part of the research project "*Cuidar educando na síndrome metabólica*" [Providing care by teaching metabolic syndrome" (Opinion Report No. 2,850,239), conducted in a PHC unit in the urban area of Jequié, BA, Brazil.

The research team invited men and women between 18 and 59 to participate in the study during their usual appointments to care for high blood pressure and DM2 at the health unit. This first contact followed a standardized screening protocol to assess volunteer eligibility. All the participants had a diagnosis of DM2 and also met the criteria for MS, which requires at least three of the following: (1) waist circumference >102 cm for men and >88 cm for women; (2) triglycerides ≥150 mg/d; (3) HDL-c <40 mg/dl in men and <50 mg/dl in women; (4) blood pressure ≥130/85 mmHg; and (5) fasting blood glucose ≥100 mg/dl.[10] Exclusion criteria were getting pregnant or missing >50% of the workshops.



Flowchart. Participants' distribution

Of the 108 adults selected for the eligibility analysis, 38 did not meet the inclusion criteria; hence, 70 adults (68.4%) with diabetes and MS remained and were intentionally allocated to the intervention or control group (35 individuals in each group). However, nine participants were excluded from the intervention group: one because she became pregnant and another eight due to low attendance at the workshops. Ten individuals were excluded from the control group because two moved to another city, and eight were not interested in continuing the study. Therefore, 51 individuals (26 in the intervention group and 25 in the control group) completed the educational intervention protocol and were included in the analyses. Figure 1 shows the participants' distribution.

First, all participants in the intervention and control groups received general information about MS and individual information regarding how many MS criteria they met and their respective metabolic risks. The educational program was developed with Pedagogical Autonomy[11] to promote the health of the participants in the intervention group. The program was led by nurses and organized into seven monthly workshops lasting from 90 to 120 minutes each. The workshops were held in groups at the health center after routine care was provided. Additionally, the workshops were organized in two parts: the first part included the participants being welcomed and the nurses addressing the content based on clinical guidelines for adults with MS[12-14]. The second part included a guest (health professionals) who talked to the participants about the group's topics of interest, which were chosen at the end of each workshop. The topics covered in the program were MS aspects and risk factors (i.e., concept, diagnosis, treatment, complications, and behavioral changes), healthy diet, sedentary lifestyle, pain, stress and anxiety, ergonomics, integrative activities, spirituality, and metabolic and cardiovascular disorders. The multidisciplinary approach included the participation of the following guests: a physical educator, a nurse, a physical therapist, a pharmacist, a cardiologist, a nutritionist, and a psychologist. The nurses who conducted the program are researchers and members of the Health and Quality of Life Research Group at the *Universidade Estadual do Sudoeste da Bahia (UESB)* and received identical instructions and training to implement the intervention.

The control group did not participate in the educational program but, like the intervention group, continued receiving the usual care at the health center with monthly consultations. The participants in the control group also received a monthly telephone call to confirm their participation in the study and attended the health center according to their appointments. Apart from the scheduled measurements, there was no additional contact between the researchers and the control group during the study period.

The Institutional Review Board at UESB approved all procedures, and the participants signed free and informed consent forms after receiving detailed clarification. The participants were assessed at two points: before the intervention and at the follow-up (six months after the intervention). Data that characterized the sample were collected at baseline through individual interviews using a structured sociodemographic questionnaire (i.e., age, sex, self-reported race, years of schooling, and general health aspects, e.g., duration of diabetes). MS was determined via the NCEP-ATP III criteria. Abdominal circumference was measured horizontally at the midpoint between the iliac crest and the lower costal margin, using a flexible and inelastic measuring tape with 0.1 cm accuracy. Weight was measured with barefoot individuals dressed in light clothing on a portable digital scale (Wiso®, model W801) with a 0-180 kg capacity and 0.1 kg accuracy. Height was measured using a portable metallic stadiometer (Sanny, capriche model) with a 0.1mm resolution. Body mass index (BMI) was calculated with the participant's weight in kilograms divided by the square of their height in meters.[15] Blood pressure was measured

with a validated semi-automatic device[16] (Omron, model HEM-742 INT) and met the criteria by the Brazilian Hypertension Guidelines.[17] The average of two readings of systolic and diastolic pressure measurements was used. Blood samples were taken from the antecubital vein, after 12 hours of fasting was confirmed, in a collection room prepared at the health center. Concentrations of serum triglycerides, HDL-c, and fasting blood glucose were measured by enzymatic methods (Roche Diagnostics).

The PSS, developed by Cohen, Karmarck, and Mermelstein in 1983 and later translated and validated by Luft *et al*.,[18] was used to assess stress. It is a 14-item scale, with seven positive and seven negative items. The negative items measure the respondents' lack of control and negative affective reactions, while the positive items measure the ability to cope with stress. Each item is rated on a five-point scale, ranging from 0 (never) to 4 (always). Its final score ranges from 0 to 56 and represents an individual's perception of stress over the last 30 days; higher scores indicate higher stress levels, and lower scores indicate lower levels of perceived stress. In this study, the total PSS scores were classified under two distinct categories, with a cutoff point ≥28 for the "stressed" category and <28 for the "non-stressed" category; this cutoff point was based on a similar study.[19]

We used the larger project database from March 15th, 2020. The sample calculation showed that 80 participants would provide a statistical power of 80%, considering an effect size of 0.25, an alpha error of 5%, and a sample loss of 20%. Mean, standard deviation, frequency, and percentage were used to report data. Normal distribution was verified using the Shapiro-Wilk test, and Levene's test was used to analyze the homogeneity of variance. The Student's t-test and the Chi-square or Fisher's Exact test were used to compare the variables between the two groups (intervention and control) at the baseline. All comparisons between the groups were based on intention-to-treat analysis using multiple imputation. Two-way (time*group) ANOVA for repeated measures was used to assess changes in perceived stress and its influence on MS parameters from the baseline to the six-month follow-up considering all participants; F and p values were reported. Bonferroni post hoc was adopted to identify differences between pairs. All statistical analyses were performed using SPSS (version 24.0); significance was set at $p<0.05$.

Results

The participants' characteristics are presented in Table 1. Data from the 51 participants who completed the study was verified to analyze the effectiveness of the intervention program. No significant differences were found between the groups at baseline for any sample characteristics. The participants were aged 48.73±7.84 on average. Most were women (86.3%), non-Caucasians (78.4%), and had a low educational level (52.9%), with a DM2 duration from 1 to 10 years (60.8%). Based on BMI (32.33±6.08 kg/m2), the participants were overweight (27.5%), or presented class I (29.4%) or class II obesity (27.5%). The average perceived stress score was 25.55±8.89 at the baseline, i.e., most individuals were not stressed (56.9%). The mean MS diagnostic criteria score was 4.05±0.75, and according to the NCEP ATP III definitions, all the MS parameters were altered.

Table 1. Participants' characteristics at the baseline

Characteristics	Total (n=51)	Intervention (n=26)	Control (n=25)	p-value
Age (years), mean ± SD	48.73±7.84	48.96±8.03	48.48±7.80	0.829
Sex, *n* (%)				
Male	7 (13.7)	5 (19.2)	2 (8.0)	0.419
Female	44 (86.3)	21 (80.8)	23 (92.0)	
Race, *n* (%)				
Caucasian	11 (21.6)	4 (15.4)	7 (28.0)	0.324
Non-Caucasoam	40 (78.4)	22 (84.6)	18 (72.0)	
Years of schooling, *n* (%)				
< 8 years of schooling	27 (52.9)	15 (57.7)	12 (48.0)	0.488
≥ 8 years of schooling	24 (47.1)	11 (42.3)	13 (52.0)	
Diabetes duration				
< 1 year	9 (17.6)	3 (11.5)	6 (24.0)	
1 to 10 years	31 (60.8)	19 (73.1)	12 (48.0)	0.184
≥ 10 years	11 (21.6)	4 (15.4)	7 (28.0)	
Anthropometrics, mean ± SD				
$Height_{(cm)}$	156.75±0.81	157.77±0.07	155.68±0.88	0.363
$Weight_{(kg)}$	79.50±16.76	79.43±12.90	79.57±20.29	0.976
$BMI_{(kg/m2)}$	32.33±6.08	31.86±4.38	32.81±7.53	0.582
Perceived Stress				
Score, mean ± SD	25.55±8.89	26.54±9.50	24.52±8.27	0.423
Stressed, *n* (%)	22 (43.1)	13 (50.0)	9 (36.0)	0.313
Not stressed, *n* (%)	29 (56.9)	13 (50.0)	16 (64.0)	
Metabolic syndrome				
Waist circumference $_{(cm)}$	105.69±12.73	107.23±9.24	104.08±15.60	0.382
$Triglycerides_{(mg/dL)}$	165.80±27.70	169.88±29.30	161.56±25.84	0.288
$HDL\text{-}c_{(mg/dL)}$	42.02±10.54	39.42±9.38	44.72±11.18	0.074
Systolic blood $pressure_{(mmHg)}$	139.06±17.95	140.04±16.73	138.04±19.43	0.695
Diastolic blood $pressure_{(mmHg)}$	85.33±10.78	85.08±10.62	85.60±11.16	0.865
$Glucose_{(mg/dL)}$	174.62±38.97	180.23±38.99	168.80±38.87	0.300
MS Score, mean±SD	4.05±0.75	4.15±0.83	3.96±0.67	0.367

Student's t-test, Chi-square of Fisher's Exact test. BMI: body mass index, HDL-c: high-density lipoproteins-cholesterol, MS: Metabolic syndrome.

Figure 2 compares perceived stress scores at the pre- and post-intervention. The health-promoting educational program was found to significantly decrease the mean of perceived stress score among the intervention participants compared to the control participants (26.54±9.50-23.46±6.43 intervention group *vs.* 24.52±08.27-28.96±9.41 control group, p=0.028; Figure A). The mean variation in stress levels was also significantly lower among the intervention participants (Δ= -3.07±8.51 intervention group *vs.* 4.44±7.22 control group, p=0.001; Figure 2B).

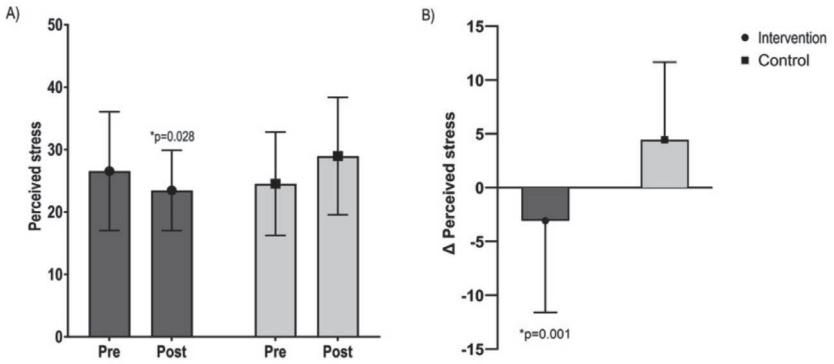


Figure 2. Comparison of perceived stress between the control and intervention groups at the pre- and post-interventions, Anova *Two-Way*

Figures 3 and 4 show that the individuals in each group were stratified according to the classification adopted for perceived stress (scores ≥28 indicate stressed individuals, and <28 indicate non-stressed individuals). The objective was to analyze the influence of perceived stress on MS parameters. The analysis showed a significant interaction for blood glucose (p=0.001) and HDL-c (p=0.003). A significant difference in blood glucose was found between stressed individuals in the intervention group (-31.59 mg/dl, 176.00±38.05 - 144.41±32.89 mg/dL) and non-stressed individuals in the control group (+35.56 mg/dl, 171.81 ±40.51 - 207.37±36.85) (p=0.026). Stressed individuals in the intervention group experienced a more significant increase in HDL-c concentrations (+6.46 mg/dl, 171.81±40.51-207.37±36.85) than those classified in the other categories (1.6 mg/dl, 42.15±10.91 *vs.* 43.71±5.49 NS-Intervention; -2.77 mg/dl, 41.77±10.92 *vs.* 39.00±10.63 S-Control; -9.06 mg/dl, 46.37±11.33 *vs.* 37.31±7.11 NS-Control).

A tendency toward a decreased mean of MS criteria was found in the intervention group, regardless of the stress level. However, stressed participants who received the intervention showed a higher decreased mean variation than those in the other categories (Δ=-0.69±1.03 S-Intervention; 0.33±0.70 S-Control; -0.38±1.26 NS-Intervention; 0.06±0.77 NS-Control), though without statistical significance (p=0.068).

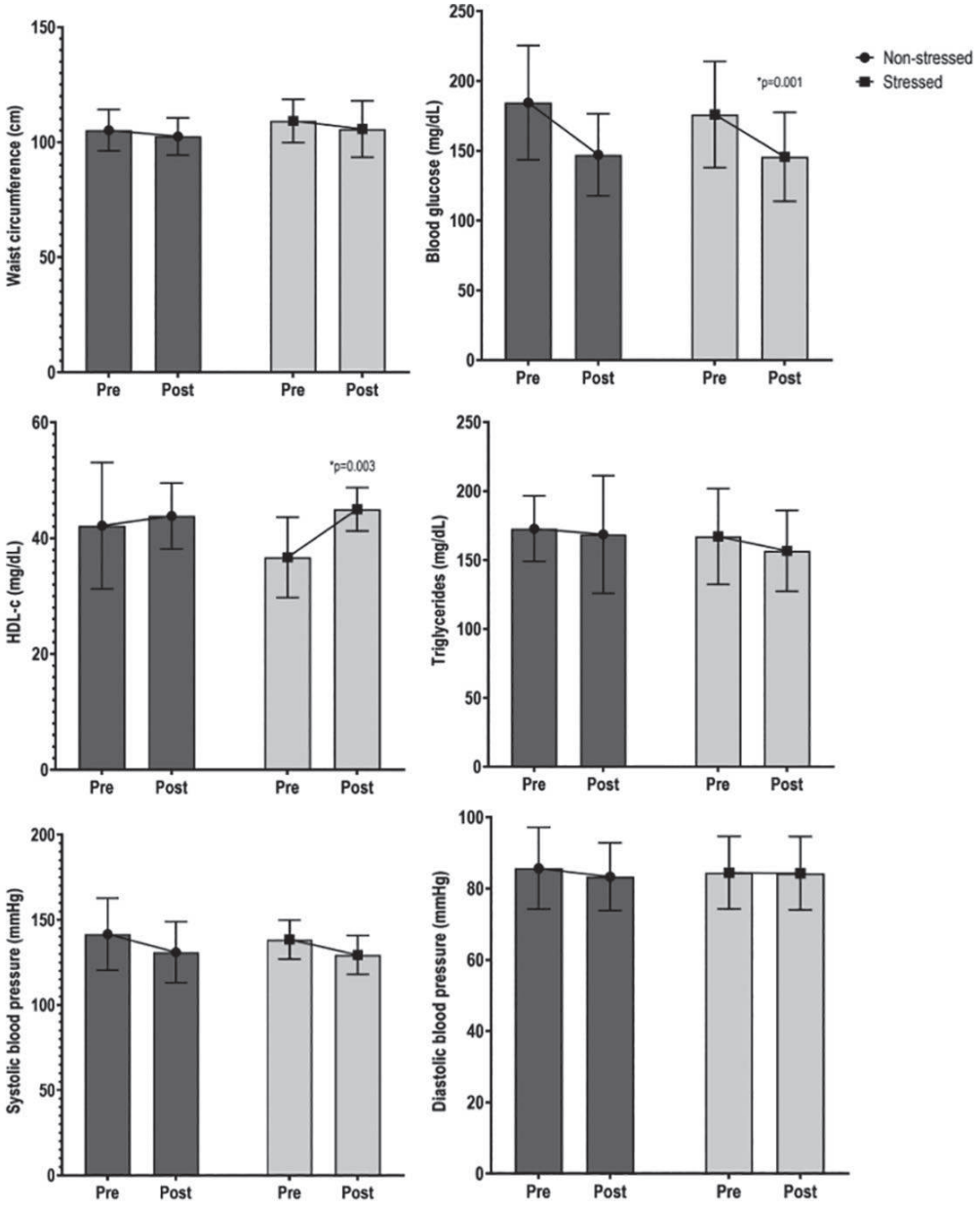


Figure 3. Clinical behavior of the intervention's effectiveness on MS parameters according to perceived stress in the intervention group (non-stressed individuals, *n*=13; stressed individuals, *n*=13), Two-Way Anova

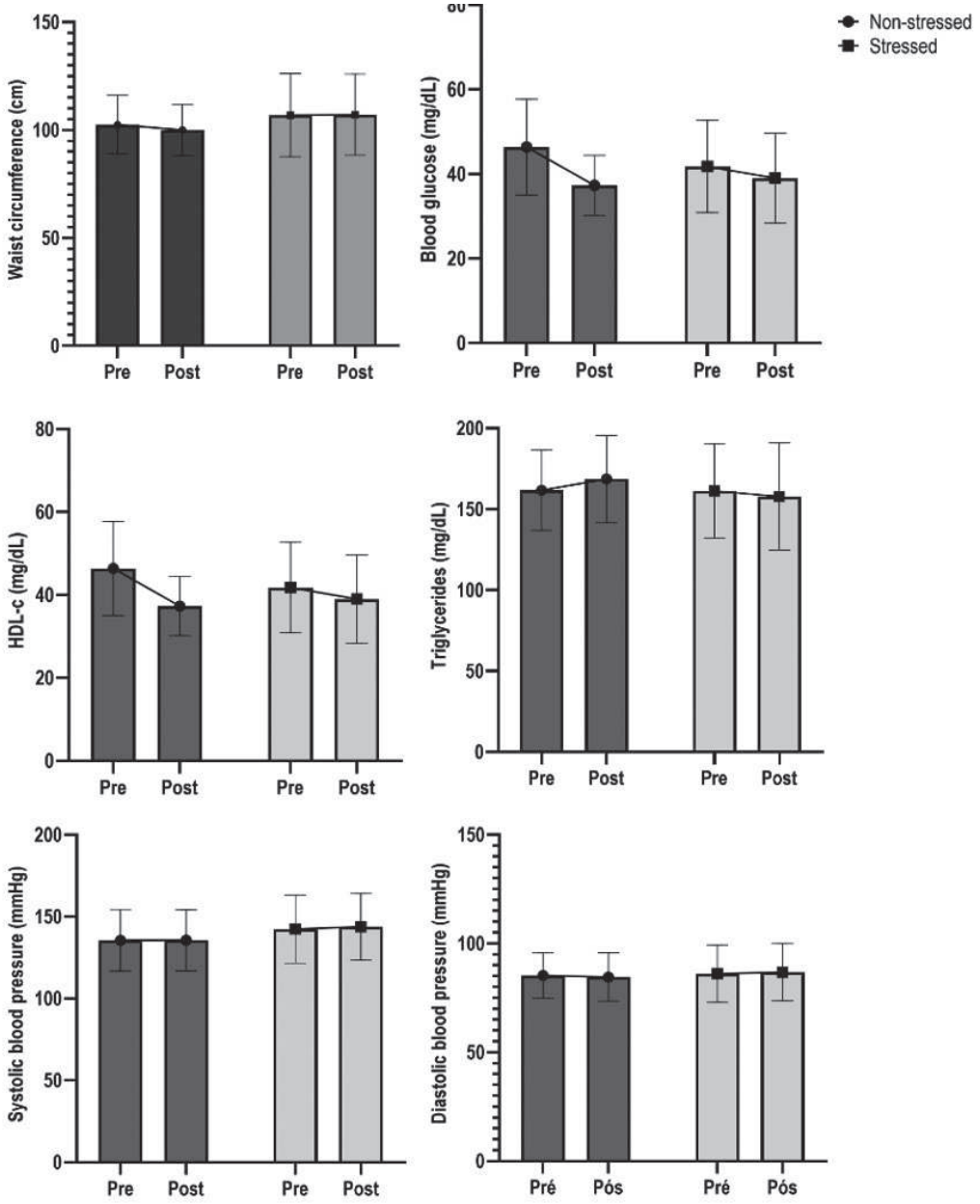


Figure 4. Clinical behavior of the intervention's effectiveness on MS parameters according to perceived stress in the control group (non-stressed individuals, *n*=16; stressed individuals, *n*=9), Two-Way Anova

Discussion

This study showed that a nurses-led educational health-promoting program with a multidisciplinary approach significantly decreased perceived stress among adults with DM2 and MS six months after the intervention. Furthermore, the relationship between perceived stress and MS parameters was verified, with the results indicating a significant interaction with fasting blood glucose and HDL-c. Hence, the intervention group participants with high-perceived stress were more likely to experience decreased blood glucose levels and increased HDL-c concentrations. Additionally, the average number of MS criteria decreased in the intervention group regardless of the stress level, though without statistical significance. These findings imply that encouraging a healthier lifestyle may improve perceived stress and the number of MS criteria over time. The differences in stress levels among the participants may influence changes in the MS parameters; however, further investigation is needed. All the participants who completed the study showed an interest in continuing to attend the meetings. Such an interest is very relevant because there is a need for long-term health-promoting programs addressing MS in PHC units; the most common reasons for dropout included follow-up loss and poor adherence.

The baseline characteristics of the individuals who remained in the project to care for their health, focusing on MS, align with previous studies.[2,6,9] In general, obese women with a low educational level and an average score of 25.55±8.89 on the perceived stress scale predominated. The frequency of obesity and MS was statistically significant among stressed individuals. However, the mean score of individuals with DM2 and MS on perceived stress was higher than in other populations.[2,5] A cohort study shows a prevalence of perceived stress of 10.13% in adults with cardiovascular risk factors, including MS (aged 54.2±9; 62.7% of women). An independent association was also found between perceived stress and obesity among men and carotid atherosclerosis among women. Additionally, individuals with chronic stress were significantly more sedentary (56.3%) and obese (48.4%) than their counterparts without chronic stress.[5]

Although the PSS scale has been used in various populations, few studies assess perceived stress using this scale in adults with DM2 and MS in the context of primary health care.[6,9] Therefore, comparisons are limited. On the other hand, a program led by Morga et al.[9] with regular exercise combined with psychoeducation, though without nurses leading the intervention, shows a decrease in the level of stress among older women with MS (aged 69.35±7.20). Another program reported data similar to our study, with a decrease in the perceived stress level of older women (aged 68.6±6.5) three months after an intervention including physical exercise, dance, health promotion education, and health psychoeducation administered in groups.[6] One of our studies shows a mean score on perceived stress of 27.73±9.17 among middle-aged women (aged 47.69±8.15) with MS: 49.3% experienced stress, and 70.7% had DM2. Furthermore, stressed women obtained higher scores on perceived stress and presented lower HDL-c concentrations than non-stressed women.[20] Perceived stress has been linked to changes in the lipid parameters of MS, especially HDL-c, which is consistent with our results.

According to the literature, high levels of perceived stress considerably increase the chances of MS prevalence.[2,8] Additionally, perceived stress is strongly correlated with cortisol levels. When associated with catecholamines, high cortisol levels appear to reduce appetite control, increasing fat accumulation and causing an increase in glucose serum levels. In a chronic state, it induces insulin resistance and lipid accumulation;[20,21] high levels of circulating cortisol contribute to MS. Therefore, decreased blood glucose and a relative increase in HDL-c are protective factors of the health of individuals with cardiometabolic disorders, even more so when experiencing stress.

[1] Furthermore, a recent study shows that the high concentration of cortisol mediated the association between higher perceived stress and more severe MS, but only among individuals with poor coping skills.[1] Some studies show an association between high cortisol levels and the prevalence of MS and abdominal fat, which was also found in this study. Likewise, a low ability to cope with stress was associated with an increased risk of developing DM2.[1,22,23]

Studies also indicate that an individual's inability to deal with stress directly impacts the quality of life and health conditions at different stages of life, as well as favor the emergence of a cluster of risk factors for MS.[8] The perception of chronic stress was significantly associated with MS criteria in Armborst et al.[2] and another study shows that the stress perception of individuals with MS negatively impacts health-promoting behaviors.[7] Indeed, the role stress plays on an individual's behavioral and physiological health condition is complex, and even more so in the presence of DM2 and MS. Blood pressure remains high in the presence of chronic stress, or more indirectly, due to an unhealthy lifestyle, with low exercise levels, a diet poor in nutrients, and alcohol consumption and smoking.[2,7] These findings imply that a nurse-led health-promoting educational program focusing on MS adopting a multidisciplinary approach can promote decreased stress levels among adults with DM2 and MS within the PHC scope; stress levels significantly decreased among this study's participants after the intervention. As reported in other studies,[2,6,9] such an effect may be linked to the participants modifying their lifestyles.

Lifestyle changes involving a healthy diet and regular exercise are the primary approach in treating MS. Nonetheless, psychological stress should not be neglected, considering that coping strategies to deal with stress can be taught. Another potential explanation for these findings is that the intervention program was implemented in groups. In addition to encouraging a healthy lifestyle, group meetings also play an essential social role in a community.[6] The group activities in our program seem to have positively influenced the participants' health, particularly the MS parameters among middle-aged individuals. A clinically relevant finding is that highly stressed participants experienced positive effects on fasting blood glucose and HDL-c. The participants' motivation in such programs improves the individuals' adherence to the program and their ability to adapt to lifestyle changes, which promotes changes in the MS parameters. Note that the adults in this study presented a low health status, and their clinical conditions seemed to decrease their motivation to implement lifestyle changes.[6,9]

All participants were provided motivational counseling during the meetings and encouraged to make lifestyle changes to improve their MS parameters. Therefore, a multidisciplinary team of specialists with experience working with individuals with MS should keep this educational approach to health promotion in the long term. Furthermore, working with groups might improve clinical results by sensitizing patients regarding the interaction between stressors and cardiometabolic parameters and improving the patients' ability to self-manage the disease.[6] Naturally, as in any health-promoting educational approach, we cannot determine the extent to which individual project elements contributed to the outcome achieved in this study.

Long-term clinical studies addressing stressed *vs.* non-stressed individuals may provide a better understanding of variations in the syndrome parameters and indicate specific interventions to address early on cardiometabolic and mental health risks related to perceived stress. Therefore, current health policies aimed at people with DM2 and MS should focus on timely screening of perceived stress to improve therapeutic management within the PHC scope. Health units also need to expand strategies to deal with psychological stress, as proper coping strategies seem to play a relevant role in

these individuals' various health risks. Hence, our findings suggest that a health-promoting educational program can enable individuals with DM2 and MS to cope with stressful situations with greater psychological resilience. This finding is consistent with a previous study.[1]

This study's sample size and short study period constitute limitations. For example, the small number of participants hindered an analysis of differences between sexes. For this reason, the generalization of results is limited and should be considered cautiously. Also, the few studies on the subject prevent comparisons. The predominance of women and their age leads us to note that the post-menopause period may cause mood changes and high stress levels, besides potential changes in cardiometabolic parameters, factors not assessed here.[6] More extensive studies are expected to investigate perceived stress in different groups, verifying how different perceptions influence MS and mental health parameters in the long term.

The complexity of health problems involving MS emphasizes the need to develop effective strategies considering biopsychosocial aspects. The implementation of a health-promoting program in PHC units can be an effective educational mechanism to support the multidisciplinary treatment of MS among middle-aged adults with diabetes. Therefore, our results suggest that health policies and health workers assisting individuals with MS should consider stress perception in their practice and services rather than only focus on lifestyle to promote stress self-management strategies and improve coping and the MS parameters. Public policies should also consider developing health programs to monitor MS and help individuals improve their lifestyle, strengthening the instructions to maintain healthy behaviors and adapt to changes, harmoniously coexisting with their clinical condition. Finally, participation in health-promoting programs might be a support mechanism to deal with stressors, improving the individuals' coping skills.

This study's results directly affect nurses' practice, highlighting the effectiveness of a nurse-led educational program to decrease perceived stress in adults with DM2 and MS. The active presence of nurses in PHC is crucial to promoting coping strategies, self-care, and lifestyle changes. The results also improve nurses' daily practice, indicating the need for investing in these professionals' training and performance. Thus, this study not only expands scientific knowledge in nursing but also provides a solid basis for the effective integration of educational programs led by nurses in primary health care to promote health and effectively manage chronic conditions such as DM2 and MS.

The conclusion is that the nurse-led health-promoting educational program to encourage lifestyle changes in the context of MS significantly decreased perceived stress among adults with diabetes and MS in a six-month intervention. Furthermore, the high perceived stress levels found in the participants in the intervention group seem to be associated with decreased blood glucose levels and increased HDL-c concentrations. Finally, the intervention group's average number of MS criteria tended to decrease, regardless of the stress level. Nonetheless, long-term studies are needed to verify the differences in the groups' perceived stress on the MS parameters and to investigate individual stress coping strategies.

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Effectiveness of virtual teaching programme regarding palliative care on knowledge, self-efficacy and attitude of Nursing Personnel in North India

Original Article

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Effectiveness of virtual teaching programme regarding palliative care on knowledge, self-efficacy and attitude of Nursing Personnel in North India

Abstract

Objective. To evaluate the effectiveness of Virtual Teaching (VT) Programme regarding palliative care on knowledge, self-efficacy and attitude among Nursing Personnel working in selected hospitals of North India. **Methods.** A quasi-experimental study with non-equivalent control group pre-test-post-test design was conducted on 121 Nursing Personnel, selected by convenient sampling technique. Knowledge, self-efficacy and attitude were

assessed using structured knowledge questionnaire, Palliative Care Self-efficacy Scale, and Frommelt Attitudes toward care of dying scale respectively. Nursing personnel in experimental group received Virtual Teaching Programme regarding palliative care whereas those in comparison group received conventional teaching (CT). The study included a pre-test followed by the teaching (virtual/ conventional) on day one. The post-test was conducted on 15th day after the intervention. **Results.** The results showed that there was a significant difference in mean post-test knowledge (VT group: 17.11 to CT group: 25.05; t=9.25, $p<0.001$), self-efficacy (VT group: 39.27 to CT group: 43.38; t=6.39, $p<0.001$) and attitude (VT group: 108.86 to CT group: 133.23; t=9.27, $p<0.001$) scores between virtual teaching group and conventional teaching group. ANCOVA test revealed statistically significant differences in the mean scores of knowledge [F (1.11) = 86.61, $p<0.001$], self-efficacy [F (1.11) = 841.75, $p<0.001$] and attitude [F (1.11) = 82.92, $p<0.001$] between the groups, with higher means obtained in the CT group. **Conclusion.** Virtual Teaching programme and Conventional teaching both were effective in enhancing the knowledge, self-efficacy and attitude among Nursing Personnel regarding palliative care with conventional teaching being more effective.

Descriptors: palliative care; telemedicine; control groups; Knowledge; self-efficacy; attitude to health; nursing staff, hospital; effectiveness.

Efectividad de un programa de enseñanza virtual sobre cuidados paliativos en los conocimientos, la autoeficacia y la actitud del personal de enfermería en el norte de la India

Resumen

Objetivo. Evaluar la efectividad de un programa de Enseñanza Virtual (EV) sobre cuidados paliativos en cuanto a conocimientos, autoeficacia y actitud entre el personal de enfermería que trabaja en hospitales seleccionados del norte de la India. **Métodos.** Se llevó a cabo un estudio cuasiexperimental con un diseño de grupo de control no equivalente. Se realizaron pre y post-prueba a 121 miembros del personal de enfermería, seleccionados mediante una técnica de muestreo por conveniencia. Se evaluaron los conocimientos, la autoeficacia y las actitudes mediante un cuestionario estructurado de conocimientos, una escala de autoeficacia en cuidados paliativos y una escala de actitudes de Frommelt hacia el cuidado de personas al final de su vida. El personal de enfermería del grupo experimental recibió un programa de EV sobre cuidados paliativos, mientras que el del grupo de comparación recibió enseñanza convencional (EC). El estudio incluyó una preprueba seguida de la enseñanza virtual o convencional el primer día y una prueba posterior al decimoquinto día después de la intervención. **Resultados.** Los resultados mostraron que había una diferencia significativa en las puntuaciones medias post-test entre los grupos en: conocimientos (EV: 17.11 y EC: 25.05; t=9.25, $p<0.001$), autoeficacia (grupo VT: 39.27 y grupo CT: 43.38; t=6.39, $p<0.001$) y actitud (grupo EV:

108.86 y grupo EC: 133.23; t=9.27, p=<0.001) La prueba ANCOVA también reveló diferencias estadísticamente significativas en las puntuaciones medias de conocimientos [F (1.11) = 86.61, p=<0.001], autoeficacia [F (1.12) =841.75, p=<0.001] y actitud [F (1.11) = 82.91, p<0.001] entre los grupos, obteniéndose medias más altas en el grupo CT. **Conclusión.** Tanto el programa de enseñanza virtual como la enseñanza convencional fueron efectivos para mejorar los conocimientos, la autoeficacia y la actitud del personal de enfermería en relación con los cuidados paliativos, siendo el beneficio mucho mayor la enseñanza convencional.

Descriptores: cuidados paliativos; telemedicina; grupos control; conocimiento; autoeficacia; actitud frente a la salud; personal de enfermería en hospital; efectividad.

Eficácia de um programa virtual de ensino de cuidados paliativos sobre conhecimento, autoeficácia e atitude da equipe de enfermagem no norte da Índia

Resumo

Objetivo. Avaliar a eficácia de um programa de Aprendizagem Virtual (VE) sobre cuidados paliativos em termos de conhecimento, autoeficácia e atitude entre a equipe de enfermagem que trabalha em hospitais selecionados no norte da Índia. **Métodos.** Um estudo quase experimental foi conduzido com um desenho de grupo controle não equivalente. Foram realizados pré e pós-testes em 121 membros da equipe de enfermagem, selecionados por meio de técnica de amostragem por conveniência. Foram utilizados os instrumentos: questionário de conhecimento estruturado, escala de autoeficácia em cuidados paliativos e escala de atitudes de Frommelt em relação ao cuidado de pessoas em fim de vida. A equipe de enfermagem do grupo experimental recebeu um programa de VE sobre cuidados paliativos, enquanto o grupo controle recebeu ensino convencional (CE). O estudo incluiu um pré-teste seguido de ensino virtual ou convencional no primeiro dia e um pós-teste no 15º dia após a intervenção. **Resultados.** Os resultados mostraram que houve diferença significativa nas médias dos escores pós-teste entre os grupos em: conhecimento (EV: 17.11 e EC: 25.05; t=9.25, p<0.001), autoeficácia (grupo VT: 39.27 e grupo CT: 43.38; t=6.39, p<0.001) e atitude (grupo EV: 108.86 e grupo EC: 133.23; t=9.27, p=<0.001). O teste ANCOVA também revelou diferenças estatisticamente significativas nas pontuações médias de conhecimento [F (1.11) = 86.61, p=<0.001], autoeficácia [F (1.12) =841.75, p=<0.001] e atitude [F (1.11) = 82.91, p<0.001] entre os grupos, obtendo maiores médias em o grupo CT. **Conclusão.** Tanto o programa de ensino virtual quanto o ensino convencional foram eficazes na melhoria do conhecimento, da autoeficácia e da atitude da equipe de enfermagem em relação aos cuidados paliativos, sendo o benefício muito maior com o ensino convencional.

Descritores: cuidados paliativos; telemedicina; grupos controle; conhecimento; autoeficácia; atitude frente a saúde; recursos humanos de enfermagem no hospital; efectividad.

Introduction

Approximately 55 million people die each year in the globe today. With the accelerated ageing process, this number is likely to rise rapidly. Despite an increase in palliative care practitioners and services in many nations, the likelihood of a rise in the number of terminally ill individuals passing away is concerning.[1] Approximately 40 million people annually require palliative care, with 78 percent residing in low- and middle-income nations. Approximately 14% of those who require palliative care worldwide currently have an access to it. Palliative care has been accessible in India, despite its limited availability, for nearly two decades. The urgency of delivering palliative care has changed dramatically in the thoughts of health care clinicians and policymakers during the previous two decades. In India, more than 60 patients die of cancer and suffering every hour. Furthermore, with over billion people distributed across a large geopolitical terrain, palliative care's reach may look unattainable.[2] The results of a survey conducted in the state of Haryana during 2016 revealed that the percentage of deaths due to cancer accounted for about 14.2% of the total deaths among the males and females aged 40 to 69 years.[3]

Palliative care is only available to a fraction of one percent of India's 1.2 billion residents. Pioneering efforts in the latter half of the century resulted in development, some of which can be seen in all developing countries. Kerala, accounting for three percent of India's total population remains at the forefront of palliative care provision.[4] Symptom management, psychosocial and spiritual support, and treatment geared specifically towards the underlying illness are the elements that make up palliative care. There is no single care that is adequate if it is not considered in conjunction with other two.[5]

Taking care of issues other than physical pain is an important component of dealing with suffering. Palliative care offers a team approach to help parents and caregivers. This entails providing practical assistance as well as bereavement counselling. It functions as a support system for patients, enabling them to die as comfortably as feasible.[6] Once nurses are able to identify the patient's symptoms and needs, they have the option of providing effective palliative care.[7] Knowledge, ideas, beliefs, and skills of health care professionals are one of the most essential elements impacting the efficacy of palliative care administration. These factors determine not only the strategy that health care professionals take during patient evaluation, but also the behaviour that they exhibit while doing so. Since nurses are responsible for the physical, functional, social, and spiritual aspects of care, they are the second-most crucial part of the palliative care team after doctors.[8]

There has been evidence that nurses and other medical professionals are ill-equipped to handle patients who are suffering. Numerous variables have been found, including insufficient knowledge, a lack of coursework on pain treatment, and attitudes and beliefs regarding pain in schools.[9] The barriers affecting the provision of palliative care can be removed or modified by careful assessment and treatment of patients requiring the care.

Palliative care in Indian setting is still not widely researched area as very few studies were found that were conducted on knowledge, self-efficacy as well as attitude regarding palliative care among Nursing Personnel. Moreover, the literature shows that the nursing personnel particularly in India, are not well prepared for taking care of patients in need of palliative care owing to lack of professional education about the same. Nurses must be educated and trained to provide palliative care to patients who require it. The need of the hour is to make content that not only meets the curriculum but also keeps students interested.[10] The authors of the present study urged to work on the area which is not readily addressed despite having an importance in clinical nursing. This study sought to assess the effectiveness of a virtual teaching programme on nursing personnel's knowledge, self-efficacy, and attitudes regarding palliative care.

Methods

A sample of 122 nursing personnel was enrolled in the study which was carried out during 2021-22. The sample size estimated was 99 based on the projected effect size of 0.39 at a power of 0.80. But due to COVID restrictions, a sample of 122 nursing personnel was only available for data collection. Out of total sample, there was an attrition of one Nursing personnel. The final study's sample size was 121. A "Quasi-Experimental (Non-Equivalent control group pre-test post-test design)" was carefully chosen to proceed with this study. This research included those having smart phones and who were willing to participate. The nursing personnel not available during data collection and not able to attend complete virtual teaching (VT) or conventional teaching (CT) regarding palliative care were not included in the research. The investigation was carried out among nursing personnel working in two tertiary care hospitals established under MMDU trust at Mullana (Haryana) and Solan (Himachal Pradesh).

Ethical Consideration. The institutional ethical committee of MMDU, Mullana granted ethical approval (IEC-1843) to perform the study. There was no/minimal ethical risk included in the study as per the guidelines of Indian Council of Medical Research Guidelines. The formal permission for conducting final study was taken from MMIMSR&H, Mullana and Medical superintendent of MMMC&H, Solan. The nursing staff gave informed consent after being guaranteed that their responses would be kept confidential.

A sample of 62 Nursing Personnel from MMIMSR&H, Mullana and 60 Nursing Personnel from MMMC&H, Solan were conveniently recruited for the final study. On day one, pre-assessment of socio-demographic and professional variables and knowledge, self-efficacy and attitude of Nursing Personnel was done through Google forms using the tools for data collection in VT group and CT group. After taking pre-test, Virtual teaching programme for 1hr 15 min regarding palliative care was administered live to Nursing Personnel in VT group via zoom platform in which case scenarios were also discussed. Whereas conventional teaching regarding palliative care was given for 1hr 15 min via lecture cum discussion method in a group of two having 30 Nursing Personnel each in CT group. The teaching content was same in VT group and CT group and was delivered by researcher. On day 15, post-test of knowledge, self-efficacy and attitude of Nursing Personnel was conducted in VT group and CT group through Google forms. The sampling flow is depicted in Figure 1.

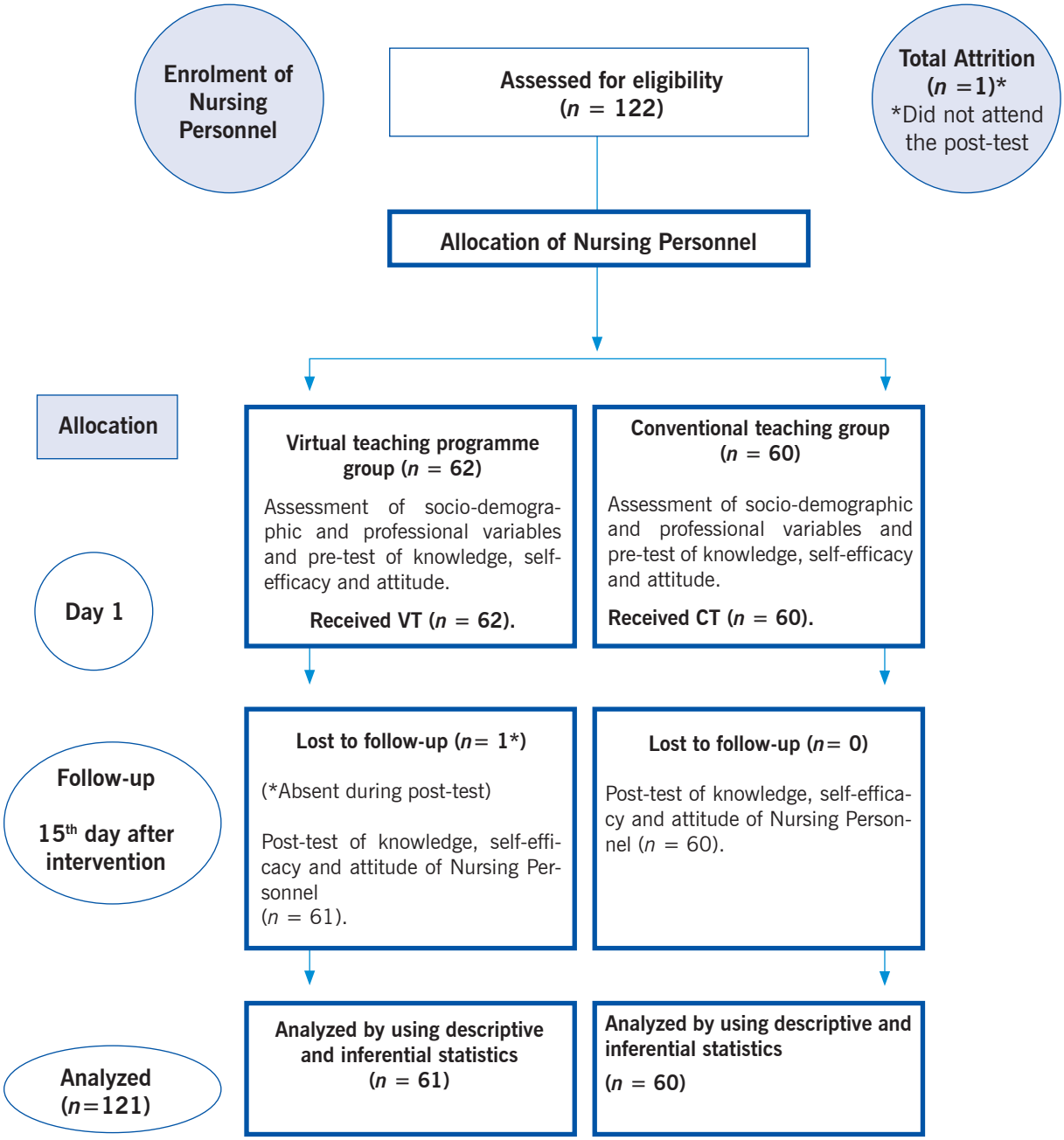

Figure 1. CONSORT Diagram showing flow of sampling

The tools used for the study were a Structured knowledge questionnaire, Palliative Care Self-Efficacy Scale and FATCOD -Frommelt attitudes toward care of the dying- scale. The structured knowledge questionnaire was formulated with the input of seven research experts and considering prior investigations, with the aim of evaluating the level of knowledge possessed by nursing personnel with respect to palliative care. There were thirty multiple-choice questions containing a single valid response. Each correct response received a point value of one, while any incorrect response received a point value of zero. Therefore, a minimum score of zero and a maximum score of 30 were applicable. A standardized tool was used to assess the self-efficacy regarding palliative care among Nursing Personnel.[11] It comprised twelve items, each of which was graded on a four-point scale, was positive, and was arranged in direct scale order. A higher score corresponds to an increase in self-efficacy. On a four-point scale, 1 indicates the need for additional fundamental instruction, 2 indicates the ability to perform with close supervision or coaching, 3 indicates the capability to perform with minimal consultation, and 4 indicates the confidence to perform independently. Probable scores cover a range of 12 to 48, with 12 representing the minimum and 48 the maximum. The highest scores indicate greater self-efficacy, while the lowest scores indicate reduced self-efficacy. FATCOD -Frommelt attitudes toward care of the dying- scale was used to assess the attitude of nursing personnel.[12] The assessment comprised 30 Likert-type items, each of which was graded on a five-point scale. Out of the total items, 15 were worded positively (1, 2, 4, 10, 12, 16, 18, 20, 21, 22, 23, 24, 25, 27, and 30) and 15 were worded negatively (3, 5, 6, 7, 8, 9, 11, 13, 14, 15, 17, 19, 26, 28, and 29). Positive items were assigned scores ranging from five (indicating strong agreement) to one (indicating strong disagreement). When evaluating negative objects, the scoring system was reversed. Scores can vary between 30 and 150. Greater ratings indicate more favourable attitudes. The reliability values of all the above-mentioned tools were 0.70, 0.70 and 0.67 respectively. All the standardized tools were incorporated in the study after getting prior permission from the tool developer. The SCVI of structured knowledge questionnaire was 0.84.

Intervention

Virtual teaching programme regarding palliative care was developed for nursing personnel to enhance their knowledge, self-efficacy, and attitude regarding palliative care through zoom platform which includes palliative care content, case scenarios, video, audio (experience shared by nursing personnel with terminally ill patients). The areas covered in the teaching plan included concept of palliative care, communication skills, assessment, and management in terminal illness (pain, dyspnoea, constipation, diarrhoea, nausea/vomiting, anorexia, delirium, malignant wound). The duration of teaching was one hour 15 minutes. The virtual teaching was given live via zoom platform that also included the discussion of case scenarios, whereas those in conventional group received the teaching by lecture-cum-discussion. The teaching content was same in both the groups.

Data were analyzed using SPSS version 20 after checking normality of data by Kolmogorov-Smirnov test. Descriptive analysis was used for the categorical variables like age (in years), gender of the participants, level of education, present area of work, experience in present working area, previous area of work, total working experience. The mean, standard deviation, and median were employed to illustrate the continuous variables. Using the independent t-test, continuous variables were compared.

Results

Since the Data was normally distributed, parametric tests were applied for the analysis. Less than half of the nursing personnel (42.6%) and more than half (63.3%) were in the age

group 25-28 years in VT group and CT group. All the nursing personnel were female (100%). More than half of the nursing personnel (68.9%), (66.7%) were having level of education of GNM in VT group and CT group respectively. More than half of the nursing personnel's (57.4%), (76.7%) present area of work was General ward in VT group and CT group respectively. More than half of the nursing personnel (70.5%), (63.3%) had ≤ 3 years of total working experience. Most of the nursing staff in both groups (91.8%) and (96.7%) had not received any training in palliative care. The two groups were comparable in terms of personal and professional characteristics except age, present area of work and total work experience. (Table 1)

Table 1. Comparison of VT group and CT group in terms of socio-demographic and professional variables of the nursing personnel regarding palliative care

Socio-demographic and professional variables	VT Group (*n* = 61) f (%)	CT Group (*n* = 60) f (%)	X^2	DF	*p*-value
Age (in years)			9.23	3	0.02
21-24	22 (36.1)	19 (31.7)			
25-28	26 (42.6)	38 (63.3)			
29-32	10 (16.4)	3 (5)			
33-36	3 (4.9)	0			
Gender			--	--	--
Female	61 (100)	60 (100)			
Level of education			0.68	2	0.71
GNM	42 (68.9)	40 (66.7)			
B.Sc. Nursing	10 (16.4)	13 (21.7)			
Post Basic B.Sc. Nursing	9 (14.8)	7 (11.7)			
Present area of work			21.65	4	<0.001
General ward	35 (57.4)	46 (76.7)			
ICU/CCU	17 (27.9)	7 (11.7)			
Emergency/OT	0	7 (11.7)			
Onco/ radiotherapy ward	2 (3.3)	0			
OPD/ MRD	7 (11.5)	0			
Experience in present working area			3.22	1	0.07
Less than 5 years	52(85.2)	57(95)			
5-10 years	9(14.8)	3(5)			
Total working experience			12.89	3	<0.001
≤ 3	43(70.5)	38(63.3)			
4-6	7(11.5)	20(33.3)			
7-9	10(16.4)	2(3.3)			
10-12	1(1.6)	0			
Do you know about palliative care?			2.27	1	0.13
Yes	54(88.5)	47(78.3)			
No	7(11.5)	13(21.7)			
If yes, source of information:			8.43	4	0.07
Curriculum	7(13)	11(23.4)			
Clinical Exposure	27(50)	23(48.9)			
Internet source	4(7.4)	8(17)			
In-service programme	10(18.5)	2(4.3)			
Any other	6(11.1)	3(6.4)			

Table 1. Comparison of VT group and CT group in terms of socio-demographic and professional variables of the nursing personnel regarding palliative care. (Cont.)

Socio-demographic and professional variables	VT Group (*n* = 61) f (%)	CT Group (*n* = 60) f (%)	X^2	DF	*p*-value
Training regarding palliative care			1.31	1	0.25
Yes	5(8.2)	2(3.3)			
No	56(91.8)	58(96.7)			
If yes, specify the name/title			7	3	0.07
Palliative care	4(80)	0			
Pain/symptomatic management	1(20)	0			
Dimension and determination of health	0	1(50)			
Physical, Mental, social, spiritual or regarding health etc.	0	1(50)			

The present study revealed a significant distinction between the VT and CT group in terms of knowledge, self-efficacy and attitude of Nursing Personnel regarding palliative care with conventional teaching being more effective. (Table 2)

Table 2. Comparison of VT group and CT group in terms of post-test knowledge, self-efficacy and attitude of Nursing Personnel

Variables	MEAN		t-value	*p*-value
	VT group (*n* = 61)	CT group (*n* = 60)		
Knowledge	17.11 ± 5.27	25.05 ± 4.07	9.25	<0.001
Self-efficacy	39.27± 4.07	43.38± 2.88	6.39	<0.001
Attitude	108.86± 14.74	133.23± 14.14	9.27	<0.001

The mean pre-test and post-test scores of knowledge, self-efficacy and attitude of Nursing Personnel in the VT and CT groups were compared using paired t-test and significant differences wars found in knowledge, self-efficacy and attitude. In both groups improved scores were observed in in both groups compared the first and second time of measurement.

To further elucidate this difference, a one-way ANCOVA was conducted to compare the groups whilst controlling for the pre-test scores. There was a significant difference in the mean knowledge [$F(1.11) = 86.61$, $p<0.001$], self-efficacy [$F(1.11) = 841.75$ $p<0.001$] and attitude [$F(1.11) = 82.91$, $p<0.001$] between the groups. (Table 4-a) The comparison of the estimated marginal means showed that there was an improvement in knowledge, self-efficacy and attitude in the CT group (mean: 25.043, 43.420 and 133.206 respectively) as compared to VT group (mean: 17.122, 39.242 & 108.896 respectively). (Table 4-b).

Table 3. Comparison of VT group and CT group in terms of knowledge, self-efficacy and attitude of Nursing Personnel before & after administration of VTP and CT

		Mean		t value	p-value
		Pre test	Post test		
VT Group (*n* = 61)	**Knowledge**	12.31 ± 3.63	17.11 ± 5.27	6.66	<0.001
	Self-efficacy	33.19± 6.49	39.28± 4.07	6.13	<0.001
	Attitude	96.60± 9.77	108.86±14.74	5.41	<0.001
CT Group (*n* = 60)	**Knowledge**	12.40 ± 5.12	25.05 ± 4.07	15.62	<0.001
	Self-efficacy	33.58± 6.21	43.38± 2.88	9.34	<0.001
	Attitude	93.53± 10.70	133.23± 14.14	17.02	<0.001

Table 4-a. Tests of Between-Subjects Effects in terms of Knowledge, Self-Efficacy and Attitude of Nursing Personnel

Dependent Variable: Post-Knowledge						
Source	**Type III Sum of Squares**	**df**	**Mean Square**	**F**	***p*-value**	**Partial Eta Squared**
Group	1897.447	1	1897.44	86.61	<0.001	0.423
Error	2584.988	118	21.90			
Dependent Variable: Post-Self Efficacy						
Group	520.974	1	520.974	41.75	<0.001	0.261
Error	1472.361	118	12.478			
Dependent Variable: Post-Attitude						
Group	17455.100	1	17455.10	82.91	<0.001	0.413
Error	24840.047	118	210.50			

Table 4-b. Estimated Marginal Means of Knowledge, Self-Efficacy and Attitude of Nursing Personnel

Group	Mean Post Knowledge	Std. error	Pre-Knowledge
VT Group	17.12	0.59	12.36
CT Group	25.04	0.60	
	Mean Post Self-efficacy	Std. error	Mean Pre - Self- efficacy
VT Group	39.24	0.45	33.84
CT Group	43.42	0.45	
	Mean Post Attitude	Std. error	Mean Pre- Attitude
VT Group	108.89	1.86	95.12
CT Group	133.20	1.88	

Discussion

After VTP and CT, there was a significant rise in knowledge scores in the present investigation from in VT and CT group. There is some evidence to suggest that these findings are similar, at least in part, with the findings of the study that was carried out by Yanping Hao *et al*.[13] in which PCQN's total score improved from 10.3±1.9 to 11.1±2.2 (p=0.011), while pain and other symptom management's score escalated from 7.7±1.7 to 8.7±1.7 (p=0.003). Identical results were reported by Joy[14] where following participation in an educational intervention, nurses in the intervention group had a discernible 12 percentage point increase in their level of knowledge on palliative care.[14]

In the present study, both VTP and CT were effective but CT was more effective as compared to VTP. In a study that was carried out by Boxel van Patris *et al.*[15] on the usefulness of videoconferencing in comparison to face-to-face palliative care teaching, the researchers came to conflicting conclusions. The nurses reported high levels of satisfaction with the instructional presentation, regardless of the mode in which it was delivered. It's possible that the time limits of the workshop could have been responsible for the ineffectiveness of videoconferencing when it came to psychological or emotional topics.

In the present study, VT group and CT group showed an increase of mean self-efficacy scores following the VTP and CT in VT group and CT group respectively. A similar study that was carried out by Phillips *et al*.[11] found a 6.5-point rise in palliative care post-test scores among RNs after a multimodal intervention, with a post-test score of 38.7. This gain accounted for 13.5 percent of the total increase. These findings were inconsistent with the findings reported by Jin Sun Kim *et al.* [16] which had a mean score of 33.8/48 for palliative care self-efficacy. The nurses lacked trust in their

abilities to communicate with patients who were in their final stages of life and the relatives of such patients, as well as handling delirium.

The findings of the present study have implications in the field of nursing education and practice. The nursing students shall study about the end-of-life experience, pain and symptom management, care objectives, and early care planning. Also, in-service education programmes regarding palliative care may be organized for the nursing staff to prepare them for taking care of the terminally ill patients.

Conclusion. The findings of this study demonstrated that Virtual teaching programme and Conventional teaching both were effective with Conventional teaching being more effective than Virtual teaching programme in enhancing knowledge, self-efficacy and attitude among Nursing Personnel regarding palliative care. Hence, organizing educational programme regarding palliative care for in-job nursing personnel is recommended to prepare them for a competent delivery of palliative care to patients.

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Original Article

Educational interventions to prevent urinary infections in institutionalized elderly people. Quasi-experimental Study

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Educational interventions to prevent urinary infections in institutionalized elderly people. Quasi-experimental Study

Abstract

Objective. To analyze the effectiveness of an educational intervention among nursing professionals and caregivers to prevent urinary tract infections in institutionalized elderly people. **Methods.** this is a quasi-experimental study carried out with 20 people (7 nurses and 13 formal caregivers). A questionnaire was applied during the pre-intervention stage, then professional training was carried out and finally, the questionnaire was reapplied 6 months after the intervention. The prevalence profile and factors associated with urinary infections in 116 elderly people was evaluated before and after the educational interventions. Statistical analysis was performed using association and correlation tests, logistic regression model comparison and prevalence rates. **Results**. The average number of correct answers by the nursing professionals

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and caregivers after the educational intervention increased from the pre to the post-test by 52% regarding signs of urinary infection, 32% regarding its symptoms, 72.5% regarding its treatment, 40% regarding personal/behavioral and morbidity-related risk factors, 59% regarding conditional factors and 43.8% regarding its preventive measures. The team of caregivers showed a greater gain in knowledge compared to the nursing team in almost every question ($p<0.05$). The length of time working in elderly care showed no positive correlation with any variable ($R<1$; $p>0.05$). The prevalence of urinary tract infection in the pre-intervention period was 33.62%, and 20% in the post-intervention period. **Conclusion.** The educational intervention was effective in preventing urinary tract infections in the elderly. The increased knowledge acquired by nurses and caregivers was associated with a reduction in the infection rate and an improvement in the most prevalent modifiable factors for the development of this type of pathology.

Descriptors: elderly; urinary infections; permanent health education; long-stay institution for the elderly.

Intervención educativa para prevenir las infecciones urinarias en ancianos institucionalizados. Estudio cuasi-experimental

Resumen

Objetivo. Analizar la eficacia de una intervención educativa con profesionales de enfermería y cuidadores para prevenir las infecciones urinarias en ancianos institucionalizados. **Métodos.** Estudio cuasi-experimental realizado con 20 personas (7 enfermeros y 13 cuidadores formales). Se aplicó un cuestionario antes de la intervención, se llevó a cabo la capacitación de los enfermeros y se volvió a aplicar el cuestionario 6 meses después de la intervención. Se evaluó el perfil de prevalencia de las infecciones urinarias y los factores asociados de 116 ancianos antes y después de las intervenciones educativas. En el análisis estadístico se utilizaron pruebas de asociación y correlación, comparación de modelos de regresión logística y tasas de prevalencia. **Resultados.** El promedio de respuestas correctas del equipo de enfermería y de los cuidadores tras la intervención educativa aumentó del pre al post-test en un 52% con los signos de infección urinaria, un 32% con los síntomas, un 72.5% con el tratamiento, y un 40% con los factores de riesgo personales/conductuales y los relacionados con la morbilidad, un 59% con los factores condicionales y un 43.8% con las medidas preventivas. El equipo de cuidadores mostró una mayor aprehensión de conocimientos en relación al equipo de enfermería en casi todas las preguntas ($p<0.05$). El tiempo dedicado al cuidado de ancianos no mostró correlación positiva con ninguna variable ($R<1$; $p>0.05$). La

prevalencia de infección urinaria en el período pre-intervención fue del 33.62% y en el post-intervención del 20%. **Conclusión.** La intervención educativa fue eficaz en la prevención de las infecciones urinarias en ancianos. El aumento de conocimientos adquiridos por los enfermeros y por los cuidadores se relacionó con la reducción de la tasa de infecciones y el mejoramiento de los factores modificables más prevalentes para desarrollar este tipo de patología.

Descriptores: ancianos; infecciones del tracto urinario; educación sanitaria continuada; centro de cuidados de larga duración para ancianos.

Intervenção educativa para prevenção de infecções urinárias de idosos institucionalizados. Estudo quase-experimental

Resumo

Objetivo. Analisar a efetividade de intervenção educativa com profissionais de enfermagem e cuidadores para prevenção de infecções do trato urinário de idosos institucionalizados. **Métodos.** Estudo quase experimental realizado com 20 pessoas (7 enfermeiros e 13 cuidadores formais). Aplicou-se questionário na pré-intervenção, realizou-se capacitação dos profissionais e reaplicação do questionário 6 meses pós-intervenção. O perfil de prevalência de infecções urinárias e fatores associados de 116 idosos foi avaliado antes e após as intervenções educativas. Na análise estatística utilizou-se testes de associação e de correlação, comparação de modelos de regressão logística e de taxas de prevalência. **Resultados.** A média de acertos da equipe de enfermagem e de cuidadores, após intervenção educativa, aumentou do pré para o pós-teste em 52% com relação aos sinais de infecção urinária, 32% a sintomas, 72.5% tratamento, e 40% sobre fatores de risco pessoais/comportamentais e relacionados a morbidade, 59% a fatores condicionais e 43,8% sobre medidas preventivas. A equipe de cuidadores apresentou maior ganho de conhecimento em relação à equipe de enfermagem em quase todas as questões ($p<0.05$). O tempo de cuidado com idoso não apresentou correlação positiva com nenhuma variável ($R<1$; $p>0.05$). A prevalência de infecção do trato urinário no período pré-intervenção foi de 33.62% e pós intervenção 20%. **Conclusão.** A intervenção educativa foi efetiva na prevenção às infecções do trato urinário dos idosos. O aumento do conhecimento adquirido por enfermeiros e cuidadores foi associado à redução da taxa de infecções e à melhoria dos fatores modificáveis mais prevalentes para o desenvolvimento desse tipo de patologia.

Descritores: idoso; infecções urinárias; educação permanente em saúde; instituição de longa permanência para idosos.

Introduction

In Brazil, most of the Long-Stay Institutions for the Elderly (Portuguese Acronym: ILPI) accommodate older adults with a morbidity profile associated with chronic diseases and polypharmacy practice (use of more than 4 medications), typical of an aging population. But in addition to that, there are people in very advanced age in the ILPIs, many with cognitive impairment and greater dependence in daily life activities; a fact that, in many situations, resulted in their institutionalization because the family was unable to provide the necessary support conditions.[1] However, institutionalization increases the propensity for developing infections, such as urinary infections, one of the most prevalent in this population group, ranging from 12 to 30%.[2] The risk factors are varied and can be linked to the condition of senescence itself as there is a decrease in the body's defense mechanisms, as well as to the fact that they live in a community space that favors the transmission between residents, in addition to factors such as the unnecessary use of antibiotics, the frequent use of diuretics, incontinence, the use of diapers and dehydration.[3] Recognizing these factors and promoting actions that reduce urinary infection rates are aspects that must permeate the practices of the nursing and caregiving teams, as these are the professionals who are constantly accompanying the elderly.

However, many nursing professionals who work in ILPIs have not developed, in their training process, skills and competencies specifically focused on the elderly. On the other hand, caregivers still lack regulations regarding their working hours and training content, thus leading to gaps in knowledge about the aging process. In this sense, care for the elderly by these professionals may be damaged by errors related to the management of health situations.[4,5] In-service educational interventions, in this aspect, are tools that can be used to address these gaps in order to promote necessary training, impact professional practice and have substantial effects on the ILPI context. The objective of this study is to analyze the effectiveness of educational intervention among nursing professionals and caregivers to prevent urinary tract infections in institutionalized elderly people.

Methods

The research was approved by the Research Ethics Committees of the State University of Santa Cruz (Protocol No. 1,050,366) and the Federal University of São Paulo (Protocol No. 2 776 379). This is a quasi-experimental, before-and-after intervention study carried out from July 2018 to July 2019 in an ILPI located in a municipality in the south of Bahia. As predicted by this type of study, when there are limitations or random sampling is impossible, comparative analyzes are carried out with the same group in the pre- and post-intervention period.[6] Therefore, the convenience sampling method was

used in the sample that received educational intervention and was made up of 20 participants. Inclusion criteria: being over 18 years old and carrying out activities in direct contact with the elderly. Exclusion criteria: being at the institution for less than 2 months, providing informal care for the elderly without any employment bond or on a voluntary basis. Of the two nurses, only one agreed to participate and was incorporated into the nursing team, totaling 7 participants. Despite the particularities which are exclusive to nurses, it was understood that it would not be necessary to analyze their performance separately from that of nursing technicians, as it would disperse the sample that is already small. If any specific data showed significant difference, it would be particularly addressed. The other group was made up of 13 formal caregivers.

The definition of the prevalence profile and the factors associated with UTIs was carried out with 116 elderly people. Inclusion criteria: aged 60 or older, of both sexes, institutionalized for at least 1 week. Exclusion criteria: being on antibiotic therapy for UTI, using a bladder catheter or having had it removed less than 72 hours ago, having been hospitalized less than 2 weeks ago. To measure the knowledge of the nursing professionals and caregivers, a self-administered structured questionnaire was applied in the pre-intervention period, consisting of 50 questions divided into Blocks (A - Signs, B - Symptoms, C - Treatment, D - Personal and Behavioral Risk Factors, E – Morbidity-Related Risk Factors, F – Conditional or Dependence-Related Risk Factors, G – Basic Preventive Measures) which included response choices and another column to mark the options Yes, No or I Don't Know – the latter was added to discourage random responses and considered as an incorrect answer. The elaboration of the questions and correct alternatives followed the Diagnostic Criteria for Healthcare-Associated Infections and the Care-Related Infection Prevention Measures of the Brazilian National Health Surveillance Agency.[7] The European Association of Urology guideline[8] and the diagnostic and treatment guideline for asymptomatic bacteriuria in adults of the Infectious Diseases Society Of America.[9] The questionnaire was validated and obtained Cronbach's alpha coefficient = 0.83 – it showed reliability and internal consistency. Once the questionnaire was applied in the pre-test stage, the professionals were subdivided into 4 groups and training was carried out. 6 workshops were conducted, 3 with each professional category and 3 with mixed categories; in total, 24 training sessions were conducted for 2 hours a week on alternate days.

The prevalence profile of urinary tract infections and their associated factors were compared before and after the educational intervention. To this end, urine was collected for laboratory analysis in both periods, an instrument was used to clinically assess the elderly and risk factors were collected from medical records, consisting of the following variables: age group – each with a 5-year interval -, sex, schooling, bedridden condition, use of wheelchair, continuous use of diapers, ability to conduct self-hygiene, continuous use of diuretics, polypharmacy practice - continuous use of more than 4 medications -, benign prostatic hyperplasia (BPH), dehydration, urinary incontinence, fecal incontinence, type 1 diabetes, type 2 diabetes, acute renal failure, chronic renal failure and cognitive impairment. Urine sample collections followed the techniques and recommendations of the Brazilian National Health Surveillance Agency[7] To diagnose UTI, McGeer's international criteria were used.[7-9]

The Accumulated Incidence (AI) and the Incidence Density (ID) of UTI were calculated using the following formulas: AI = New cases of UTI in a 6-month period/Number of elderly people at risk in the 1st month of the period x 100 and ID = New cases of UTI in a 6-month period/Number of elderly people-time at risk (total number of elderly people in the 6 months) x 100. Descriptive statistics were used to define the profile of professionals in relation to sex, age group, schooling level, length of time working in elderly care. The analysis of

the questionnaire results was carried out using inferential and descriptive statistics; the pre- and post-educational intervention periods were compared. To determine whether there was a statistically significant increase in the average number of correct answers, both in the pre- to post-test periods, the Wilcoxon Paired Test was applied. The Kruskal-Wallis test was used to evaluate the relationship between the average number of correct answers and the schooling level and professional category. Spearman's Rank Correlation Coefficient (R) was carried out to analyze the average number of correct answers and how it is impacted by the length of time working in elderly healthcare.

To define the prevalence profiles and factors associated with UTI in the pre- and post-educational intervention periods, a bivariate analysis of the variables was carried out. Afterwards, final multivariate logistic regression models were created, and the statistically significant variables were determined. To analyze changes in the factors associated with urinary infection in the pre- and post-educational intervention periods, these models were compared. Statistical analyzes in each model were performed using the Fisher's Exact Test, with Odds Ratio calculations that considered p-value<0.05 as a statistically significant value. A comparison was also made between the AI and the ID of UTI in the 6 months before and in the 6 months after the educational intervention. The R software was applied to carry out all statistical analyses.

Results

The nursing team was made up of 7 participants (6 nursing technicians and 1 nurse). The average time working in elderly care was 7 years. The female gender prevailed, with 5 women on the team. As for the 13 caregivers, they all had completed high school and a non-regulated caregiving training course, with varied course loads - a minimum of 60 hours and a maximum of 160 hours. The average time working in elderly care was 8 years. The female gender also prevailed in the group, that was made up of 10 female caregivers. It was not possible to effectively analyze the staff sizing, as it would have to be rated by the elderly or the ILPI. However, when considering the level of lower complexity – that is, independent elderly people -, a quantitative of 80 elderly people, a ratio of 6 professionals for 12 hours of work, and a 12h/24h work regime, the nursing team would need three times as many professionals.

Knowledge of professionals after the Educational Intervention

Table 1 presents the average of correct answers given pre- and post-test by the professionals who participated in the training course at the ILPI and their increase in knowledge after the educational intervention.

Table 1. Average of correct answers in the pre- and post-test periods, divided into blocks of questions and increase in knowledge of the ILPI professionals after the educational intervention, 2019

Block of Questions	Average of Correct Answers Pre-test (*n*=20) %	Average of Correct Answers Post-test (*n* =20) %	Difference between Averages (Increase in knowledge) %	*p value**
A – Signs	39.0	91.0	52.0	<0.01
B – Symptoms	61.4	93.6	32.2	<0.01
C – Treatment	10.0	82.5	72.5	<0.01
D – Personal/Behavioral Risk Factors	43.1	85.0	41.9	<0.01
E – Morbidity-Related Risk Factors	28.1	67.5	39.4	<0.01
F – Conditional Risk Factors	34.5	93.5	59.0	<0.01
G – Preventive Measures	49.4	93.1	43.7	<0.01
Total	39.5	86.8	47.3	<0.01

* Paired Wilcoxon Test

In every Block of Questions there was statistical significance (p<0.01) when comparing the pre- and post-test periods, and an increase in knowledge after the educational intervention was inferred. In Block A, referring to signs of UTI, the average number of correct answers went from 39% in the pre-test to 91% in the post-test, demonstrating a 52% increase in knowledge. In this block, during the pre-test period, the alternative that stood out as the one with the highest number of correct answers stated that a fever occurs when the temperature is above 38 degrees, with 100% correct answers; however, no participant marked the alternative that stated that the elderly not necessarily have a fever from a UTI, which was the most significant error – 0% score -; the other alternatives in the block scored about 40% between correct answers and errors. After the intervention, the alternative that had the biggest percentage of error reached a 90% score and the highest percentage of correct answers remained at 100%, just like in the pre-test. In Block B, regarding the symptoms of UTI, the average of correct answers went from 61.4% in the pre-test to 93.6% in the post-test, that is, a 32.2% increase in knowledge. This was the block of questions with the highest average of correct answers, both in the pre- and post-test. The largest percentages of correct answers were found in the alternatives related to pain while urinating (100%), increased urinary frequency (85%) and constant urge to urinate (75%). The largest percentage of errors occurred by marking the options “cold feet” and “headache” as symptoms of UTI - 65% of the participants marked these alternatives. However, after the intervention, only 5% still identified these symptoms as being related to UTI. The highest percentage of correct answers remained between 90 and 100%.

In Block C, regarding treatment, 10% was the average percentage of correct answers in the pre-test, and in the post-test, it increased to 82.5%, an increase of 32.2%. This was the block of questions in which participants had the least prior knowledge. The highest percentage of correct answers was 40% in the alternative that mentions that the prescription of antibiotics should only be required when signs and symptoms are present, necessarily. The highest percentages of errors occurred by marking the alternative that stated that the urine test is sufficient to determine

infection in the elderly and the one that affirmed that a positive urine test would certainly require the prescription of antibiotics by the doctor, with a 0% score, that is, everyone marked these options, as they considered them to be true. After the educational intervention, these errors were reduced, since 90% of participants did not mark these alternatives. The highest percentage of correct answers went from 40% to 85%, making this block the one with the best post-test performance.

In block D, the average number of the correct answers was 43.1% in the pre-test and 85% in the post-test, that is, there was an increase of 41.9% in knowledge. In the pre-test, the questions related to personal/behavioral risk factors that showed the highest number of correct answers referred to the alternatives that stated that "not hydrating" is a factor for UTI, with 55%, and that women are more prone to UTI, with 40%. The alternative that saw the highest percentage of error was that the one that stated that being barefoot on a cold surface was a factor for infection; only 30% got this question right. In the post-test, the percentage of correct answers increased to 80% on this item. In the post-test, the other items remained with about 50% of correct answers and the "not hydrating" item went up to 100%. In Block E, regarding morbidity-related risk factors, the average of correct answers was 28.1% in the pre-test and went up to 67.5% in the post-test; therefore, the increase in knowledge was almost 40%. Among the factors with correct answers, urinary incontinence was the most prominent (75%), however, few listed fecal incontinence (25%) and diabetes (20%) as associated factors. In the post-test, the highest percentage of correct answers remained at around 75%, but participants were now able to associate fecal incontinence and diabetes to UTI susceptibility - the average of correct answers increased to 80% for each of the alternatives.

In Block F, referring to conditional risk factors, the prior knowledge of the participants was also considered low, with an average of 34.5% correct answers, but increased to 93.5% in the post-test, an increase of almost 60% - the second-best performance. The continuous use of antibiotics was not marked as an associated factor to UTI - 0% score -, the use of diapers and several medications - polypharmacy - was barely marked (20%). The alternative regarding the use of shared underwear was the one with the highest percentage of error, as everyone marked this option as a predisposing factor to UTI - 0% score. However, this alternative was no longer considered a risk factor in the post-test, that is, 100% answered the question correctly. This percentage of correct answers was also observed in relation to the continuous use of diapers.

Regarding the preventive measures, in Block G, the increase in the average knowledge of the participants increased by 32.2%, as the average of correct answers went from 49.4% in the pre-test to 93.1% in the post-test. The measures with the most correct answers in the pre-test referred to "frequent diaper change" and "promotion of water intake" in case the elderly person has no restrictions, which resulted in an average of 70% correct answers on both items. "Instructing the elderly to perform intimate hygiene from the vagina-perineum area to the anus" had 45% of correct answers and the lowest number of correct answers was related to "hand hygiene", even with gloves, in procedures, material handling and in the physical contact among elders, which presented only 35% of correct answers among the participants. After the educational intervention, the measures with the highest correct answers reached 100%. The items regarding female intimate hygiene and hand hygiene reached 90% of correct answers. Table 2 compares the average of correct answers given by nursing professionals and elderly caregivers in the pre- and post-test.

Table 2. Average of correct answers in the pre- and post-test, divided into blocks of questions and given by each professional category

Block of Questions	Average of Correct Answers Pre-test Nur.* (*n*=7) %	Average of Correct Answers Pre-test Care.** (*n*=13) %	*p value***	Average of Correct Answers Post-test Nur.* (*n*=7) %	Average of Correct Answers Post-test Care.** (*n*=3) %	*p value***
A – Signs	37.14	30.77	<0.01	60.00	54.29	<0.01
B – Symptoms	20.41	38.46	0.03	53.85	75.51	<0.01
C – Treatment	14.29	7.69	0.26	64.29	76.92	0.12
D – Personal/Behavioral Risk Factors	50.00	33.93	0.25	39.52	46.15	<0.01
E – Morbidity-Related Risk Factors	25.00	19.23	0.02	44.64	47.12	<0.01
F – Conditional Risk Factors	44.29	29.23	<0.01	47.14	65.38	<0.01
G – Preventive Measures	44.64	43.27	0.94	50.00	49.4	0.82

(*) Nur. – Nursing Professionals; (**) Care. – Formal caregivers of the elderly;
(***) Kruskal-Wallis test calculated separately in the pre-test and post-test.

The category of nursing professionals presented higher averages of correct answers in the pre-test, compared to the caregivers, regarding signs, morbidity risk factors and conditional risk factors ($p<0.05$). In relation to treatment, personal/behavioral risk factors and preventive measures, being part of the nursing team did not present statistical significance that would indicate a difference in knowledge compared to the caregivers. Most correct answers given by nursing professionals were found in the questions related to signs" and "personal/behavioral risk factors" Blocks, with averages of 54.29% and 50% respectively. The lowest number of correct answers was related to "symptoms" (20.41%) and "treatment" (14.29%). In turn, among elderly caregivers, most correct answers were related to "symptoms" (38.46%) and "preventive measures" (43.27%) and the lowest averages of correct answers were related to "treatment" (7.69%) and "morbidity-related risk factors" (19.23 %).

However, after the educational intervention, elderly caregivers had higher averages of correct answers than nursing professionals in practically all blocks of questions in the post-test period with statistical significance ($p<0.05$), showing a great gain in knowledge. The highest averages of correct answers were found in Block B - symptoms (75.51%) and Block F - conditional risk factors (65.38%). Nursing professionals only achieve better scores (60%) in Block A, regarding signs of UTI, compared to caregivers (54.29%), showing statistical significance ($p<0.05$). Blocks C – treatment, and G – preventive measures, were not statistically significant.

It is important to highlight that in Block D, which included questions related to personal and behavioral risk factors for the development of UTI among elderly people, the nursing team had its average number of correct answers reduced from 50% in the pre-test to 39.52% in the post-test.

Regarding the relationship between the length of time working in elderly care and the percentage of correct answers, the Spearman Correlation test was used; it was found that there was no positive or negative correlation with statistical significance (R was between -1 and 1, with a p-value>0.05), considering both the individual questions and the blocks of questions, before or after the educational intervention. Therefore, it is inferred that there was no interference from this variable in the behavior for correct answers. The same occurred with the schooling level - the Kruskal-Wallis test was used and the results indicated no association with the average number of correct answers before or after the educational intervention (p-value >0.05).

Prevalence profile and factors associated with UTI after the educational intervention

In the pre- and post-intervention periods, the age groups from 81 to 85 years old and over 85 years old predominated - approximately 40% of the total number of elderly people. The average age was 78.8 years (Standard Deviation (SD) ± 7.69), for both sexes. Females accounted for more than half of the number of institutionalized elderly people (60%). The schooling level ranged from 0 to 9 years of study, with an average of just 2.12 years of study (SD ± 2.81) at both periods. Upon summing up the percentages of illiterates and those with 1 to 3 years of study, we reached a percentage of 80% of the elderly, thus evidencing a low level of education.

The UTI profile before the educational intervention showed a prevalence of 33.62%, made up of 39 symptomatic elderly people with positive urine cultures from a total of 116 residents. After the educational intervention, the prevalence reduced to 20%, with 16 symptomatic elderly people out of a contingent of 80 elderly people. In the 6 months prior to the educational intervention, there were 17 cases of UTI, thus the AI was 14.66% and the ID was equivalent to 2.72 cases/100 older adults-month. In the 6 months after the educational intervention, 8 UTI cases emerged, the AI reduced to 10% and the ID to 1.8 cases/100 older adults-months. In the pre- and post-intervention periods, after the bivariate analyses were carried out, final logistic regression models were created with the factors associated with UTI. Table 3 presents a comparison between these models, in which the Odds Ratio is demonstrated in the pre-intervention period as *OR-A* and in the post-intervention period as *OR-B.*

It can be observed that the female gender variable doubled the chance of developing UTI pre- and post-intervention (*OR-A*: 2.0 and *OR-B*: 2.1). Continuous use of diapers also doubled this chance in the pre-intervention period (*OR-A*: 2.2) and in the second model it did not show any statistical significance ($p>0.05$). Continuous use of diuretics (*OR-A*:2.9 and *OR-B:*3.2) and urinary incontinence (*OR-A*: 2.8 and *OR-B*: 2.9) remained associated, tripling the chance of UTI in both models. However, in the pre-intervention period, dehydration was the biggest variable associated with UTI, reaching 40 times the potential for infection (*OR-A*: 40.0) but in the post-intervention period, no association was found. The variables type 1 diabetes (*OR-A*: 7.0 and *OR-B*: 7.2) and benign prostate hyperplasia (*OR-A*: 13.0 and *OR-B*: 13.1), both pre- and post-intervention, remained associated with UTI, with a 7- and 13-time chance of development, respectively. Regarding fecal incontinence, the chance of association with UTI decreased from 5 to 4 (*OR-A*:5.30 to *OR-B*:4.10).

The other tested and analyzed variables: age group, schooling level, bedridden condition, use of wheelchair, ability to conduct self-hygiene, polypharmacy practice, type 2 diabetes, acute and chronic renal failure and cognitive impairment were not included in the final regression models as they failed to present statistical significance associated with UTI, both in the pre- and post-intervention periods. The variables “dehydration” and “continuous use of diapers” were kept in

the comparative presentation to illustrate their different behavior in the 2 models. Regarding the microorganisms in the samples, there was also no significant change between the pre- and post-intervention profile. *Escherichia coli* strains prevailed in 72% of the samples.

Table 3. Comparison of the Models of Multivariate Analysis of Factors Associated with Urinary Infection in Institutionalized Elderly People before and after the educational intervention

	Pre-Intervention (n=116)			Post-Intervention (n=80)		
Variable	p-value*	Odds Ratio (OR-A)**	Confidence Interval (95%)	p-value*	Odds Ratio (OR-B)***	Confidence Interval (95%)
Female gender	0.015	2.0	0.99 - 4.06	0.013	2.1	1.21 – 3.99
Continuous use of Diapers	0.039	2.2	1.50 - 4.80	0.821	-	-
Continuous use of Diuretics	0.03	2.9	1.20 - 6.55	0.022	3.2	1.32 – 6.85
Dehydration	<0.001	40.0	12.80 - 120.1	0.243	-	-
Fecal Incontinence	0.002	5.30	1.78 - 15.4	0.003	4.1	1.61 – 15.00
Type 1 Diabetes	0.021	7.00	1.30 - 34.0	0.023	7.20	1.24 – 33.21
Benign Prostate Hyperplasia***	0.020	13.0	1.80 - 293.0	0.033	13.1	1.73 – 185.00

(*) Fisher's Exact Test; (**) OR-A = *Odds Ratio* pre-intervention = values only for variables with statistical significance p-value<0.05; (***) OR-B = *Odds Ratio* post-intervention = values only for variables with statistical significance p-value<0.05*; (****)* Calculated only considering elderly men.

Discussion

The professional profile in elderly care reflects a pattern commonly observed also outside the ILPI, with a female workforce prevailing among the nursing professionals and caregivers.[10-12] Although the length of time working with elderly care among the professionals had an average of 7 and 8 years, when it comes to comparing knowledge, this factor did not interfere with the average of correct answers, nor did their schooling level. This can be explained because the nursing professionals did not have specific training in elderly healthcare. In a study about care practices in ILPI, professionals pointed out that there must be more specific approaches to elderly healthcare that consider gerontological content and practical experience in the training process.[13,14]

In the nursing area, the discipline of elderly healthcare is still poorly structured in training courses.[4,5,14] The training of caregivers is not yet regulated - the proposed bill aimed at regulating the professional practice of caregivers is to be approved, but it does not mention how training institutions will define the program content or the priorities in this training process.[15] However, the caregiver team showed greater acquisition of knowledge compared to the nursing team in almost every question (p<0.05). In a study about the training of professionals working in ILPI, caregivers reported that they need greater training in elderly healthcare as they must qualify their work.[14] On the other hand, nursing activities cause work overload and are not restricted, in most cases, exclusively to the ILPI, as most professionals have an employment bond with other healthcare

spaces.[10,12-14] Among the aspects related to the knowledge of signs, symptoms and treatment (Blocks of Questions A, B and C), all participants were unaware that in UTI, the absence of fever in the elderly may occur due to a senescent change in their thermoregulation, leading to a lowest basal temperature in the elderly;[2,16] therefore, this is not an absolute sign of UTI, and other changes must be observed for an accurate diagnosis.[7-9]

Increased knowledge in the post-test period, especially regarding the "treatment" item that went from 10% to 82.5%, is important to avoid incorrect diagnoses or iatrogenesis among the elderly when prescribing antibiotics. In an international study about myths in the diagnosis and treatment of UTI, it was detected that many urine cultures are requested without proper indication, or the patient receives unnecessary antibiotic therapy due to the high value given to lab tests to the detriment of the clinical practice.[17] Recognizing what the older adult reports or feels in the process of determining an urinary infection is important to help the doctor provide a conclusive diagnosis and monitor the evolution of the cases.[16,18]. As in the ILPI this professional is a volunteer and is not present in the daily care of the elderly, it is imperative that the team of professionals observe these aspects to avoid risk situations for the elderly and actively participate in the management process of the UTI cases.

When comparing the regression models after the educational intervention regarding the risk factors associated with UTI, the items "type 1 diabetes" and "benign prostate hyperplasia" remained associated with UTI after the intervention. Polypharmacy practice, even though it failed to show significant association, is another reality among the elderly. These factors, in themselves, already indicate the need to discuss cases in the daily routine of the ILPI in order to avoid adverse effects such as inappropriate prescriptions, complications caused by drug interactions or reduction of effects due to the chronic conditions presented.[16,18,19] Furthermore, in the COFEN [Brazilian Federal Nursing Council] Resolution No. 620/19, it is explained that the information inherent to elderly care recorded in medical records is the responsibility of the nursing team, information that is essential to the elderly care process.[20]

Still comparing the pre- and post-intervention profiles, fecal incontinence reduced from 5.30 to 4.1 and the continuous use of diapers, which doubled the chance of UTI, was no longer associated. In Block of questions E, about morbidity factors related to urinary infection, few marked fecal incontinence as a predisposing factor, but in the post-test, the number of correct answers increased to 80%. Among the conditional risk factors, the item "use of diapers" went from 20% to 100% in terms of increased knowledge and, regarding the preventive measures, the item "frequent diaper change" was the factor with the highest frequency of correct answers – the average of correct answers increased to 90%, as well as the item "hand hygiene" - barely marked in the pre-test. The relationship between all these elements can influence cases of UTI, as the continuous use of diapers in incontinent patients favors the accumulation of urine and feces, thus increasing the risk of UTI and cross-infections.[3,21-23]

Studies indicate that more frequent diaper changes and better hand hygiene can have an impact on reducing UTIs.[22,23] Most urine culture samples were associated with the bacterial growth of *Escherichia Coli* - almost 70% - with resistance also estimated in other international studies,[23-25] however, this is an enterobacteria present in the human intestine and can be transmitted through inadequate hand hygiene or by the presence of stool in the perineal region, close to the urinary meatus, especially in elderly women. Correct hand hygiene is seen as essential for reducing the rates of nosocomial infections.[25] It is considered that, as there were changes in the diaper changing schedule at the ILPI during the study, at the initiative of the caregivers, in which they added one more period in the morning and one more in

the afternoon, this may have contributed to the reduction of factors associated with incontinence feces and continuous use of diapers, in addition to raising awareness about hand washing during these changes.

As for the changes in the UTI profile, dehydration was a factor that increased the chance of developing the infection by 40 times. After the educational intervention, when comparing the logistic regression models, this association no longer emerged. What may corroborate to the reduction of this risk factor is the finding that, among the personal/behavioral risk factors (Block D), the option "lack of hydration" was marked in 55% of the answers in the pre-test, and in the post-test, in 100% of the answers. In turn, the item "promotion of water intake to the elderly", among the prevention measures (Block G), went from 70% to 100%. However, it is important to note that the use of diuretics and urinary incontinence remained associated, tripling the chances of developing UTI. Increased water intake and the use of diuretics make elderly people more prone to urinary incontinence and consequently, to the use of diapers, thus requiring greater attention from the nursing professionals and caregivers.[3]

There was a reduction from 33.62% to 20% in the UTI prevalence rates, from 14.66% to 10% in the AI rates and from 2.72 cases/100 elderly-month to 1.8 cases/100 elderly-month regarding ID. The increase in knowledge and the transformation of this ILPI scenario regarding urinary infections, after the educational intervention, became evident, even six months after the educational intervention workshops, which allows us to infer that the acquisition of knowledge was facilitated and learned/grasped, with impacts on professional practice.[22]

The limitations of the study refer to the fact that it used a convenience sampling in which there were few participants, thus preventing generalizations. However, it does not prevent it from being replicated and reproduced in other realities.

Conclusion

The educational intervention was effective to prevent UTIs among the elderly, as it led to a gain in knowledge for both the nursing professionals and the caregivers, providing changes in the epidemiological profile with a reduction in the rate of infections and in the most prevalent modifiable factors for the development of the disease. The study contributed to reducing one of the most incident and prevalent infections in ILPIs through professional training, and this result was reflected on the quality of elderly care. Thus, the educational intervention demonstrated that education is a transformative tool in the health spaces in which nursing is inserted, especially if used in a way that values the subjects in the learning process.

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Review

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An Analysis of Approaches to Reduction of HIV Stigma across the World through educational interventions: A Scoping Review

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An Analysis of Approaches to Reduction of HIV Stigma across the World through educational interventions: A Scoping Review

Abstract

Objective. To determinate the educational interventions for reducing the stigma caused by HIV worldwide. **Methods.** This scoping review study analyzed all papers published from early 2000 to the end of 2022 by searching all the scientific databases, Scopus, Web of Science, PubMed, Cochrane, Embase and CINHAL. The quality assessment of the papers was done using the ROBIS tool checklist. **Results.** 31papers were admitted to the scoping review

Conflicts of interest: None.

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process. Stigma reduction intervention was founded on three parts: Society, health and therapeutic services providers, and the patients who had HIV and their families. The interventions included education on the reduction of fear, and shame, observation of protective standards, conducting tests and treatment at the above levels, as well as the support provided by the society, policymakers, religious leaders and families of patients in economic, psychological and cultural terms, together with the establishment of social centres and organization of campaigns. **Conclusion.** The stigma associated with HIV is a significant obstacle before treatment, life expectancy and living quality of patients. Therefore, the stigma associated with this disease can be reduced, and the living quality of patients can be raised using approaches such as education of healthcare service providers and afflicted people, as well as economic, social, cultural, and psychological support.

Descriptors: health education; social stigma; HIV; systematic review.

Análisis de los enfoques para reducir el estigma del VIH en todo el mundo mediante intervenciones educativas: Una revisión de alcanza

Resumen

Objetivo. Determinar las intervenciones educativas para reducir el estigma causado por el VIH en todo el mundo. **Métodos.** Revisión de alcance en el que se analizaron los artículos publicados desde 2000 a 2022 recuperados en las bases de datos científicas Scopus, Web of Science, PubMed, Cochrane, Embase y CINHAL. La evaluación de la calidad de los artículos se realizó mediante la lista de comprobación de la herramienta ROBIS. **Resultados.** Se admitieron 31 artículos. Las intervenciones para la reducción del estigma se basaron principalmente en tres componentes: La sociedad, los proveedores de los servicios de salud, y los pacientes con VIH y sus familias. Las intervenciones incluyeron la educación sobre la reducción del miedo y la vergüenza, la observación de las normas de protección, la realización de pruebas y el tratamiento en los niveles de atención, así como el apoyo prestado por la sociedad, los responsables políticos, los líderes religiosos y las familias de los pacientes en términos económicos, psicológicos y culturales, junto con la creación de centros sociales y la organización de campañas. **Conclusión.** El estigma asociado

al VIH es un obstáculo importante ante el tratamiento, la esperanza y la calidad de vida de los pacientes. Por lo tanto, es posible reducir el estigma asociado a esta enfermedad y elevar la calidad de vida de los pacientes mediante enfoques como la educación de los proveedores de servicios sanitarios y de las personas afectadas; así como el apoyo económico, social, cultural y sicológico.

Descriptores: educación en salud; VIH; estigma social; revisión sistemática.

Análise das abordagens para reduzir o estigma do HIV em nível global por meio de intervenções educacionais: uma análise de escopo

Resumo

Objetivo. Analisar as intervenções educacionais implementadas para reduzir o estigma relacionado ao HIV. **Métodos.** A revisão de escopo analisou artigos publicados de 2000 a 2022 recuperados dos bancos de dados científicos Scopus, Web of Science, PubMed, Cochrane, Embase e CINHAL. A avaliação da qualidade dos artigos foi realizada usando a lista de verificação da ferramenta ROBIS. **Resultados.** 31 artigos foram admitidos. As intervenções para redução do estigma baseavam-se principalmente em três componentes: Sociedade, prestadores de serviços de saúde e pacientes com HIV e suas famílias. As intervenções incluíram educação sobre a redução do medo e da vergonha, adesão a normas de proteção, testagem e tratamento nos níveis de atendimento, bem como apoio fornecido pela sociedade, formuladores de políticas, líderes religiosos e familiares dos pacientes em termos econômicos, psicológicos e culturais, juntamente com a criação de centros sociais e a organização de campanhas. **Conclusão.** O estigma associado ao HIV é um grande obstáculo ao tratamento, à esperança e à qualidade de vida dos pacientes. Portanto, é importante reduzir o estigma associado a esta doença e aumentar a qualidade de vida dos pacientes através de abordagens como a educação dos prestadores de cuidados de saúde e das pessoas afetadas; bem como apoio económico, social, cultural e psicológico.

Descritores: educação em saúde; HIV; estigma social; revisão sistemática.

Introduction

The HIV/AIDS pandemic has been a highly significant public health challenge in the world in the past decades.[1] In 2017, among the 36.9 million people infected with HIV worldwide, 25% were not informed about their disease, and less than 60% had taken any therapeutic measures.[2] The global goal is to put an end to the HIV pandemic by the end of 2030; as per the United Nations' strategy, the set goals should be achieved by 2020. These goals include the following: 90% of people living with AIDS/HIV (PLWHA) ought to get informed of their serological status; they should receive treatment, and the viral load should drop in 90% of the PLWHA who are getting treatment.[3,4] However, various factors have acted as obstacles to achieving these goals; for instance, the stigma and discrimination associated with HIV have served as major challenges in this regard.[5] Stigma is an undesirable or discredited characteristic attributed to a person; it also lowers the individual's position in society's view.[6]

Stigma is a sign of either shame or scandal; it impacts how others and the individual understand each other; besides, it questions the social identity and humanity of the individual.[7] Stigma can destructively impact people; for instance, it can provoke family disputes and lead to social consequences and human rights violations.[8] HIV or AIDS is a disease subject to stigma and discrimination caused by lack of knowledge, misinformation, fear of disease transmission, moral judgement about the behaviour of infected individuals and high-risk behaviours attributed to it, such as sexual contact, sex workers, and addiction. People with HIV are subject to various discriminatory behaviours such as rumours, blame, rejection, social isolation, unemployment, verbal and physical abuse, mistreatment and refusal to receive health care. [9-11]

The stigma associated with PLWHA falls into three categories, 1- applied or experienced, 2- anticipated or perceived, and 3- internalized stigma.[12,13] In applied or experienced stigma, the individual faces discrimination and stigma for infection with HIV; in anticipated or perceived stigma, PLWHA are expected to face stigma and discrimination from others; in internalized stigma, the infected people feel ashamed and have a negative image of themselves.[14] The applied and anticipated stigmas cause refusal of doing tests, being afraid of disclosure of HIV status, lack of access to health and medical services and reluctance to apply for treatment;[15-17] internal stigma causes anxiety, stress, depression, lower self-efficacy, lower self-esteem, despair and in some cases suicide. Therefore, the stigma's impact can often be more adverse than the disease.[18,19]

To avoid stigma, PLWHA and their family members refrain from disclosing the status of their disease; it both increases the possibility of the disease spread and reduces PLWHA's chances of seeking social support and receiving

medical care.[20] Therefore, there is a growing need to overcome the stigma associated with HIV/AIDS worldwide.[21,22] There are different types of stigma associated with AIDS; thus, PLWHA are regularly exposed to stigma from society, health care providers, family members and themselves; thereby, most of the educational interventions done across the world have been carried out in these areas.[22] Awareness of the interventions created for reducing stigma and applying this knowledge is essential. Therefore, the present study, aimed at determining the approaches and educational interventions for reducing the stigma associated with HIV worldwide, was done through a scoping review method.

Methods

This research was carried out with the scoping review method based on the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses of PRISMA[23] concerning the approaches to reducing the stigma caused by HIV in the world. All the international scientific databases, Cochrane, PubMed, Web of Science, Scopus, Embase and CINHAL, were searched for the papers published from early 2000 to the end of 2022; the search was done using the Mesh keywords: Social Stigma, Stigma, Shame, HIV, Acquired Immunodeficiency Syndrome, Health Personnel, Students, Medical And other keywords includein: self-stigma, social stigma, stigma reduction, discrimination, human Immunodeficiency Virus, AIDS, intervention, people living with HIV/AIDS, PLWHA, healthcare providers, people living close to HIV, PLC. Keywords were searched in the papers' title, abstract, and full text singularly and collectively using OR and AND operators. The search syntax in PubMed was: ((((((“Social Stigma”[Mesh]) OR “Stigma”[Mesh]) OR “Shame”[Mesh]) AND “HIV”[Mesh]) OR “Acquired Immunodeficiency Syndrome”[Mesh]) AND “Health Personnel”[Mesh]) OR “Students, Medical”[Mesh].

Inclusion and Exclusion Criteria. Inclusion criteria were organized by Problem or Population, Interventions/Exposure, Comparison, and Outcome (PI(E)CO): Population: People living with HIV, health care providers, and community. Intervention/exposure: stigma reduction approaches, economic, social, psychological, therapeutic, and religious supports. Result: reduction of stigma in patients with HIV. A group of studies were excluded from this research: they were conducted as observation, review, letter to the editor, case report, and cases series, plus those without any intervention, those with low quality, or those published in a language other than English.

Selection of Studies. The initial search provided 6852 relevant papers. Then, the resources were entered into Endnote software to organize the studies. The duplication of resources was checked with the software, and 1682 duplicates were omitted. Then, the full text of the papers was obtained, and their titles and abstracts were evaluated, and then, 4882 articles not related to the purpose of the systematic review were omitted. Finally, the full text of 288 related articles was reviewed, and 257 studies conducted using non-interventional methods were eliminated. A total of 31 related articles were admitted to the systematic review process (Figure 1).

Quality Assessment of Papers. The quality assessment of the articles was done using the Tool to assess risk of bias in systematic reviews (ROBIS) checklist. This checklist has seven sections Random sequence generation, Allocation concealment, Blinding of participants and personnel, Blinding of outcome assessment, incomplete outcome data, Selective reporting and other sources of bias, in each section the answers Lower risk of bias, Higher risk of bias or unclear risk of bias can be selected.[24]

Data Extraction. Quality assessment and extraction of information were done independently by two researchers trained in the examination,

quality assessment and evaluation of papers. Accordingly, the researchers investigated the title and abstract of the papers meeting the inclusion criteria for the systematic review. If the articles were thoroughly relevant, their full text was evaluated. If two researchers rejected an article, the reason for the rejection was mentioned. In cases of disagreement between the two researchers, the article was assessed by a third person. In order to extract data, a checklist was used; it covered the corresponding author's profile, the place and time of the paper's publication, the type of intervention, and the two groups of intervention and control.

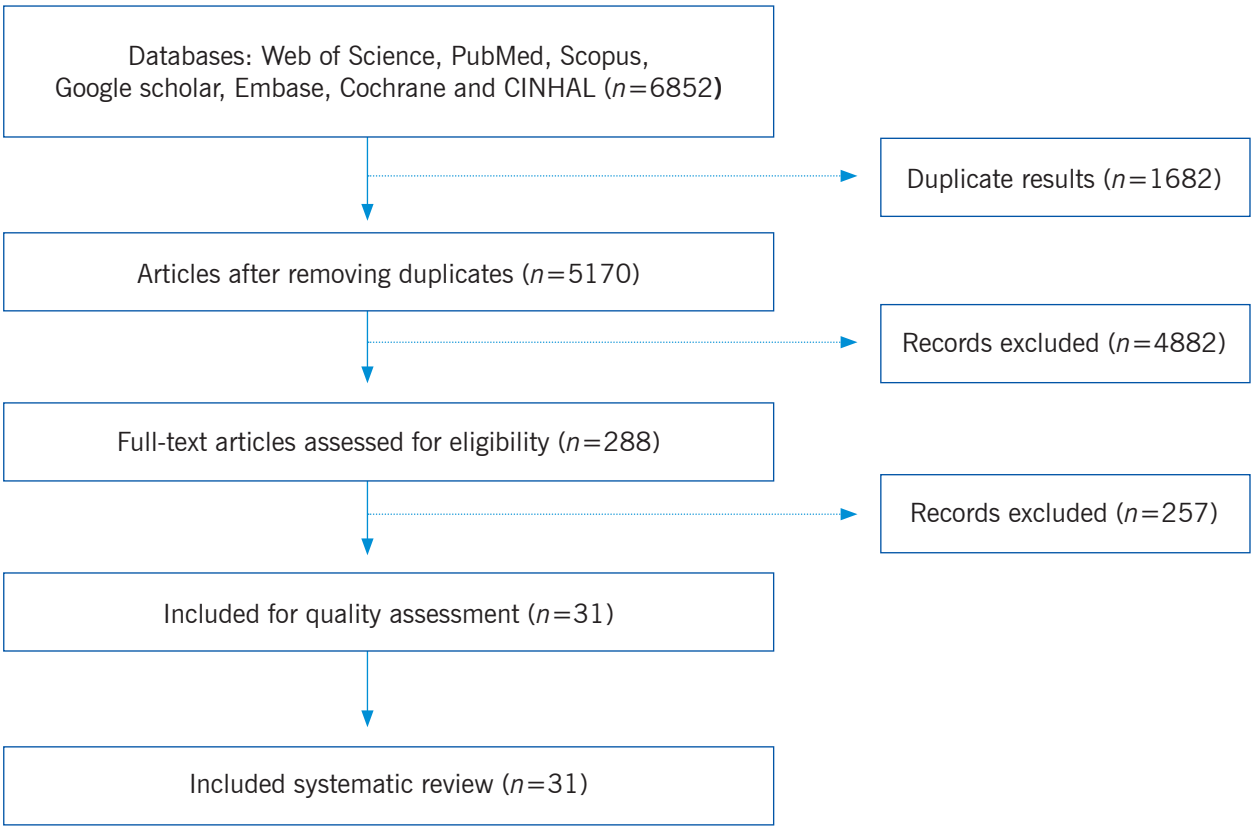

Figure 1. The PRISMA flow diagram

Results

The present research investigated 31 interventional studies carried out from 2008 to 2020 on the reduction of stigma across the world. Among the conducted studies, 9 were carried out on community-based reduction of stigma, 11 were done on medical department employees and students, and 11 were interventions covering individuals with HIV. The specifications of the reviewed articles are presented in Table 1 and the results of the quality assessment of the articles are presented in Table 2.

Table 1. The features of the papers admitted to the systematic review

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Nyblade *et al.*[25]	2020	Ghana	Health Facility Staff	-	Education and putting up posters, banners and instructions about reducing stigma.	Reduction of Stigma	Mild
Machowska *et al.*[26]	2020	India	Health Facility Staff and Students	650	**Education about stigma reduction.** The education was on the epidemiology of HIV infection, the mechanisms of virus transmission, diagnostic tests, treatment options, how ART drugs work, and ethical issues related to PLWHA and their rights, the duties of HCPs, universal precautions, and measures for prevention from infection.	Increasing Knowledge and Changing Attitudes	High
Ekstrand *et al.*[27]	2020	India	Health Facility Staff	3182	**Tablet-based Application.** Intervention included two self-guided sessions on tablet devices and one joint skill-based session. Each tablet session included four parts and was a combination of video commentary by a narrator, interactive practices, reflection on the content and a summary of key points. Face-to-face session included experiences of PLWH around the diagnosis of HIV plus positive and negative interactions with health care system.	Reducing Misconceptions, Reducing Approval of Mandatory Policies and Discrimination and Stigma	High
Jacobi *et al.*[28]	2020	Cameroon	Secondary School Students	400	**Education on the Multiple Aspects of HIV and AIDS and Stigmatization.** The content of the educational sessions included 1- elaboration on the problem; 2- more understanding, less fear; 3- sex, ethics, shame and blame; 4- family and stigma; 5- coping with the stigma; and 6- moving towards action. Then the students made a story around different topics related to HIV and stigma inside society. Then, they, accompanied by a film production group, turned these scripts into plays and recorded them on DVDs.	Improving Knowledge and Performance Regarding the Reduction of Stigma	High
Camlin *et al.*[29]	2020	Kenya and Uganda	Community	144	**A theoretical Model of Stigma Reduction.** Reduction of internal stigma was performed through two processes of acceleration of absorption and successful use of ART; reduction of anticipated stigma was made via normalization, reduction of fear and improving the quality of HIV care.	Reduction of Stigma	High

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Bauermeister *et al.*[30]	2019	Carolina	Black Men Who Have Sex with Men with and without HIV	238	**Health Empowerment Intervention.** web-based sessions were threefold; 1- sharing information and experiences of participants through conversations around different subject areas like getting tested, safe intercourses, dates and relationships, healthy life and living skills; 2- asking questions anonymously by participants from a doctor specializing in infectious diseases and uploading questions and answers as posts so that all participants can have access to them; 3- Sharing multimedia content including poems, videos, images and news stories and commenting on them.	Reduction of Stigma	High
Rao *et al.*[31]	2018	Chicago and Birmingham	African American Women with HIV	239	**UNITY Workshop.** The UNITY workshop started with a discussion around group expectations and the meaning of stigma; then, the group watched a 3-4 minutes stimulating video that was intended to provoke a discussion among the members, and following the end of the video, a facilitator led the discussion; during the discussion, the participants exchanged their reactions to the video and shared their personal experiences associated with stigma in a large group. The following practice included methods of confronting stigma, self-soothing, modelling, and practising assertiveness vs passivity or aggressiveness in response to stigma, practising self-esteem, and social support. Finally, it focused on disclosing information through case studies and role-playing.	No Effects on Stigma	Mild
Li *et al.*[32]	2018	Toronto	PLHIV* and Non-PLHIV Community Leaders	67	**Collaborative Learning Approach Based on CHAMP Study.** (CHAMP) evaluated the effectiveness of two group interventions, treatment, education, acceptance, commitment and social justice capacity development in reducing the stigma caused by HIV. In his study, educational activities encompassed experimental practices related to social inclusion or exclusion, critical conversations about social oppression, sharing resistance strategies, and participation in developing collective strategies to deal with HIV-related stigma and other social inequalities.	Reduction of Stigma	High

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Payne-Foster *et al.*[33]	2018	Alabama	Community	12 Churches	**Reducing Faith-based Stigma Using FAITH Educational Intervention.** The FAITH intervention included eight modules to educate about HIV, highlight the negative impacts of stigma, encourage action to counter stigma, and support PLWH.	Reduction of Stigma	Mild
Jaworsky *et al.*[34]	2017	Toronto	Medical Students	38	**Education.** Education content around HIV counselling and tests was submitted to students. The student provided pre- HIV-test counselling, including obtaining sexual history and consent for taking an HIV test from the individual who had HIV. In one scenario, she delivered the negative test results and post-test counselling; in the other scenario, presented the positive test result and post-test counselling to patient.	Reduction of Stigma	Mild
Tsai *et al.*[35]	2017	Kenya	PLHIV	54	**Living Intervention.** A small loan about 125 US dollarswas provided for purchasing a manual water pump and related farm devices, together with an eight-session educational program on agriculture and financial management.	Reduction of Stigma	High
Prinsloo *et al.*[36]	2017	South Africa	PLHIV and Community Members	632	**Stigma-reduction Community "Hub."** The intervention included 27 three-hour workshops on understanding HIV stigma for People living with HIV/AIDS (PLWHA) groups and members of the society, five educational workshops on combating HIV stigma for those interested, and weekly door-to-door education on understanding HIV stigma using pamphlets. Later, a six-session support program for both groups and eight psychotherapy group sessions were held to reduce HIV stigma in places such as churches, communities, and clinics.	Reduction of Stigma	High
Derose *et al.*[37]	2016	US	Community	-	**Church-based Educational Workshop.** The educational workshops were held on raising awareness about HIV, enhancing knowledge around HIV tests and HIV infection, and creating empathy for the people with HIV in churches.	Reduction of Stigma and Increase in HIV Testing	Mild

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Varas-Diaz *et al.*[38]	2016	Puerto Rico	Medical Students	507	**Education-based Stigma-free Spaces in Medical Scenarios.** The education was provided as supplying information about HIV stigma and its consequences on service provision, the role of negative emotions like fear, shame, disgust and admiration in forming HIV stigma-based attitudes and behaviours, and skills for stigma-free interaction with PLWHA.	Reduction of Stigma	High
Pretorius *et al.* [39]	2016	South Africa	PLHIV and Close Family Members	18	**Educational Workshop.** The intervention consisted of a two-day workshop centred around understanding HIV stigma, identifying patients' strengths and how they deal with responsible disclosure, and a three-day workshop on reducing HIV stigma based on the PLWH community and their families.	Reduction of Stigma from the Family	Mild
Skinta *et al.*[40]	2015	San Francisco	Gay and Bisexual Men with HIV	5	**Acceptance and Compassion-Based Group Therapy.** Education was held about introducing patients to the principal perspectives of the treatment group and aligning them with these perspectives. It included an introduction to stigma and identification of valuable practices as a tool to find ways to experience better life quality; The education also covered endeavours to control or avoid negative responses to HIV status and their effect on patients, value-centred behaviours and the focus on compassion, together with remembering the supportive and lovely people in one's life. The education further discussed the acceptance, awareness and manner of alleviating concerns about HIV, self-description concerning HIV, viral load, sexual desires, experiences and history of rejection, as well as positive thoughts about oneself; other issues dealt with by the discussion were the significance of willingness to return to valuable behaviour in life, and the importance of the desire to engage in behaviours that raise fear and thoughts of HIV stigma without attempting to control or put an end to those thoughts and envisioning a caring friend.	Reduction of Stigma	Mild

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Rivera *et al.*[41]	2015	New York	High-risk Population	716	**An Educational Video Based on Social-cognitive Theory.** The ten-minute-long educational video covered the normalization of HIV and HIV testing, education about HIV testing, promotion of HIV testing and awareness of HIV status.	Reduction of Stigma and Increase in HIV Testing	High
Pulerwitz *et al.*[42]	2015	Vietnam	Hospital Staff	795	**Stigma Reduction Education.** Educating the staff of the hospital covered: 1- Creation of a safe and friendly hospital environment; 2- Greater respect, care and support for the people who have HIV; 3- Developing practical skills to implement global precautionary measures systematically; 4- laying down a code of practice specifically for each hospital concerning the adoption of stigma-free practices so that the quality of services provided to HIV patients and stigma reduction approaches are enhanced.	No Effects on Stigma	High
Shah *et al.*[43]	2014	India	Nursing Students	91	**Short-term Educational Program to Reduce Stigma.** The intervention worked on building knowledge about the reduction of fear of the possibility of HIV transmission during short interactions, HIV epidemiology, transmission routes, misconceptions of transfer and ways of preventing HIV transmission; then, a PLWH told the story of his life before being infected with HIV; he further shared experiences of being stigmatized inside the health care environments together with some reflections on how this stigma impacted him	Reduction of Stigma	Mild
French *et al.*[44]	2014	South Africa	PLHIV and Close Family Members	83	**Educational Workshop.** The PLWH were educated about understanding the stigma associated with HIV, knowing personal strengths, and handling the disclosure of HIV status. Then, workshops in the form of speeches and discussions and small group activities were held in urban and rural environments with PLWH and PLC about (a) sharing information about the stigma of HIV and countering it, (b) balancing relationships between PLWH and PLC via increased interactions and contacts, and (c) empowering participants to become leaders of HIV stigma reduction using the practical knowledge and the experience provided by the programs of HIV stigma reduction and implementing them within the communities.	Reduction of Stigma	High

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Barroso *et al.*[45]	2014	South Africa	HIV-Infected Women	99	**Educational Video.** A 45-minute video included five representations of the women infected with HIV; each woman told narratives with different topics. Narratives included the experience of an HIV-infected woman of the fear of negative social influences caused by letting others know about her HIV status, serious conflict over (not) informing her children, the importance of communication with nurses, doctors, and trusted family members and friends, the positive effects of disclosure and extra stigma and discrimination associated with being a woman, and a minority woman	Reduction of Stigma	Mild
Varas-Diaz *et al*.[46]	2013	Puerto Rico	Medical Students	507	**Education-based stigma-free spaces in medical scenarios.** The education was provided as supplying information about HIV stigma and its consequences on service provision, the role of negative emotions like fear, shame, disgust and admiration in forming HIV stigma-based attitudes and behaviours, and finally, skills for stigma-free	Reduction of Stigma	High
Li *et al.*[47]	2013	China	Health Staff	880	**Education of popular opinion leaders** (POL) **about the reduction of stigma.** POLs were educated about observing global precautionary standards and ensuring occupational safety, combating stigma and improving the relationship between the patient and the service provider, taking measures and attempting to take care of patients and resolve problems and create a better medical environment, and finally distributing the intervention messages to the members of their community.	Reduction of Stigma	High
Jain *et al.*[48]	2013	Thailand	Community	560	**Positive Partnership Project.** In the project of positive partnership, low-interest loans were granted to a pair composed of a PLHIV individual and a healthy one. They started their career by training and obtaining marketing, accounting and business management skills. Besides, stigma reduction interventions included launching HIV campaigns, providing information and education, plus holding entertainment events.	Increasing the Knowledge of HIV transmission, Reducing the Fear and Shame	High

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Rao *et al.*[49]	2012	Washing-ton	Women Living with HIV	24	**Unity Workshop.** Workshops included: practising 1- relaxation and self-care; 2- sharing strategies for combating other group members; 3- watching stimulating videos; 4- discussing how to handle potentially stigmatizing situations with family, at work, and in other locations; and -5 role-playing ways for handling)	Reduction of Stigma	Mild
Li *et al.*[50]	2010	China	Market Workers	4510	**Effectiveness of Popular Opinion Leaders on Reduction of Stigma.** POLs were taught to take on roles as the advocates of AIDS prevention in the market; afterwards, they acquired skills and knowledge on how messages about reducing HIV risk should be disseminated in everyday conversations and how they should share these skills with others.	Reduction of Stigma	High
Rimal *et al.*[51]	2008	Malawi	Commu-nity	1776	**Radio Diaries Program.** This radio program, aimed at reducing the stigma of HIV among the people, allowed HIV-infected men and women to talk about the events of their daily life openly.	No Effects on Stigma	Mild
Wu *et al.*[52]	2008	China	Health Staff	138	**Education.** Short counter-stigma education was provided around the issues appertaining to awareness of HIV policies and procedures, ensuring access to universal precautions, post-exposure prevention, enhancing knowledge of HIV transmission, and raising the comfort level of working with PLWH. Then, the program concentrated on equal medical treatment for all individuals, regardless of their social status, type of disease, or routes of infection. Afterwards, the participants discussed the possibly discriminatory language, attitudes, and behaviours commonly heard or observed in a medical environment, and then, the ways of changing them were dealt with.	Reducing negative feelings towards people with HIV	Mild
Ma *et al.*[6]	2019	World	PLWHA	23	Stigma reduction approaches among PLWHA and their families included: psycho-educational intervention, supportive intervention for adherence to treatment (antiviral treatment), psychotherapy intervention, narrative intervention and social participation intervention.	Reduce stigma	-

Table 1. The features of the papers admitted to the systematic review. (Cont.)

Author	Year	Country	Target group	*n*	Intervention	Effect	Quality assessment
Thapa *et al.*[53]	2017	World	Community	21	The strategies to reduce the stigma caused by HIV and increase testing included: creating awareness, influencing normative behavior, providing support and developing regulatory laws. which could reduce the stigma caused by HIV and lead to an increase in the recruitment of people for HIV testing.	Reduce stigma	-
Feyissa *et al.*[2]	2019	World	Community	14	Information-based, skills building, structural, contact-based and biomedical interventions.	Reduce stigma	-

Table 2. Evaluation of the quality of the articles by level of risk of bias in included articles in the systematic review

Author	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias
Nyblade *et al.*[25]	High	Low	Low	Low	Low	Low	Low
Machowska *et al.*[26]	High	High	Unclear	Low	Low	Low	Unclear
Ekstrand *et al.*[27]	Low	Low	Low	Unclear	Low	Low	Low
Jacobi *et al*.[28]	High	Low	Unclear	Low	Low	Low	Unclear
Camlin *et al.*[29]	Low	Low	Low	Unclear	Low	Unclear	Unclear
Bauermeister *et al.*[30]	Low	Low	Low	Low	Low	Low	Low
Rao *et al.*[31]	Low	Low	Low	Low	Low	Low	Unclear
Li *et al.*[32]	High	Low	Low	Unclear	Low	Low	Low
Payne-Foster *et al.*[33]	Low	Low	Low	Low	Low	Low	Low
Jaworsky *et al.*[34]	High	Low	Low	Low	Low	Low	Unclear
Tsai *et al.*[35]	High	High	Low	Unclear	Low	Low	Low
Prinsloo *et al.*[36]	High	High	Low	Unclear	Low	Low	Low
Derose *et al.*[37]	High	Low	Low	Low	Low	Low	Unclear
Varas-Diaz *et al.*[38]	Low	Low	Low	Low	Low	Low	Low
Pretorius *et al.*[39]	High	High	Low	Low	Low	Low	Low
Skinta *et al.*[40]	High	High	Low	Low	Low	Unclear	Low

Table 2. Evaluation of the quality of the articles by level of risk of bias in included articles in the systematic review. (Cont.)

Author	Random sequence generation	Allocation concealment	Blinding of participants and personnel	Blinding of outcome assessment	Incomplete outcome data	Selective reporting	Other sources of bias
Rivera *et al.*[41]	High	Low	Low	Low	Low	Low	Unclear
Pulerwitz *et al.*[42]	High	Low	Low	Low	Low	Low	Unclear
Shah *et al.*[43]	High	Low	Low	Low	Low	Low	Unclear
French *et al.*[44]	High	High	Low	Low	Low	Low	Low
Barroso *et al.*[45]	Low	Low	Low	Low	Low	Low	Low
Varas-Diaz *et al.*[46]	High	Low	Low	Low	Low	Low	Low
Li *et al.*[47]	Low	Low	Low	Low	Low	Low	Low
Jain *et al.*[48]	High	High	Low	Low	Low	Unclear	Low
Rao *et al.*[49]	High	Low	Low	Low	Low	Low	Low
Li *et al.*[50]	High	High	Low	Low	Low	Low	Low
Rimal *et al.*[51]	High	High	Unclear	Unclear	Low	Low	Low
Wu *et al.*[52]	High	High	Low	Low	Low	Low	Low
Ma *et al.*[6]	High	Low	Low	Low	Low	Low	Low
Thapa *et al.*[53]	High	Low	Low	Low	Low	Low	Low
Feyissa *et al.*[2]	High	Low	Low	Low	Low	Low	Low

Overall, the findings illustrated that the stigma associated with HIV causes adverse impacts on the patients' physical, mental and social health and acts as a significant obstacle to the prevention, control and treatment of this disease. In order to achieve control of the HIV epidemic, the reduction of stigma is emphasized across the world. The review of the studies shows that, with regard to the types of the stigma associated with HIV and the conducted evaluations, interventions have been carried out at three levels of society, healthcare service providers and patients who have HIV and their families; the following elaborates on these interventions:

Society-based Interventions

In the studies centred around the society-based interventions carried out on reducing stigma in people with HIV, generally, we can point to the following component:; 1- Normalization of contracting the disease and allying fear through education and intervention programs inside the society that leads to an increase in taking HIV tests as well as applying for treatment and experiencing less isolation; 2- Opening up opportunities for social support and solidarity through the generation of jobs for the infected individuals and providing financial supports such as offering job facilities in this regard; 3- Education about HIV, it's testing

and treatment in religious environments and developing religious and educational programs for the attendance of the people suffering from HIV at these places; 4- Production of films, slides, banners and educational files about HIV for people in the community; 5- Forming associations that support HIV patients, and 6- Employing radio and television to educate the community about HIV. (Figure 2)

Intervention on the Health and Medical Staff and Students of Medical Sciences

According to the findings, in order to maintain health, people with HIV should be provided with health care and medical services; besides, they should experience no shame, stigma and inappropriate treatment when they attend the centres. Therefore, an environment should be created where patients enjoy safety, confidentiality and empathy; the staff should also provide medical services, control the disease without fear, and behave appropriately towards patients. Accordingly, interventions were made in this regard for training and preparation of the personnel and students of medical departments. In the conducted studies, various interventions were made to reduce stigma among the people infected with HIV. Generally, the components of interventions are 1- Education about the provision of services to HIV patients; 2- Education about global standard precautions; 3- Education about preserving the privacy of patients as well as confidentiality; 4- Education about HIV infection, mechanism of virus transmission, diagnostic tests and treatment options; 5- Education about allaying fear and implementation of programs and group meetings, as well as role playings; 6- Implementation of web-based interventions with applications; 7- Informing the public by putting up banners and posters related to the reduction of the stigma in centres of service provision and public places; 8 - The utilization of POLs for conducting interventions and running educations. (Figure 2)

PLWH-based Interventions

As per findings, the central point about reducing stigma in people with HIV is empowerment, allaying shame and fear caused by disclosure, treatment and presence in communities. Thus, these goals will be achievable via conducting intervention programs like education, preparing conditions for the presence of PLWHs in the community and their employment, and the acceptance and acceptability of these people. According to the results of the conducted studies, approaches to the reduction of stigma in PLWH included: 1- Web-based interventions and formation of mass media campaigns; 2- Sharing information and experiences and educational videos about HIV, such as programs about getting tested, safer intercourses, dating, social relationships, healthy living and living skills among PLWHs; 3- Organizing workshops and educational and functional campaigns about HIV covering positive living, easing fear and reduction of isolation, coping with stigma and applying for treatment and participation of PLWHs in these programs; 4- Living intervention and aiding PLWH's occupational activities; 5- Forming a community centre for reduction of the stigma associated with PLWH and provision of supports by organizations, leaders and popular mobilization; 6- Educating PLCs about the reduction of stigma, increasing positive interactions and management of the relationship. (Figure 2)

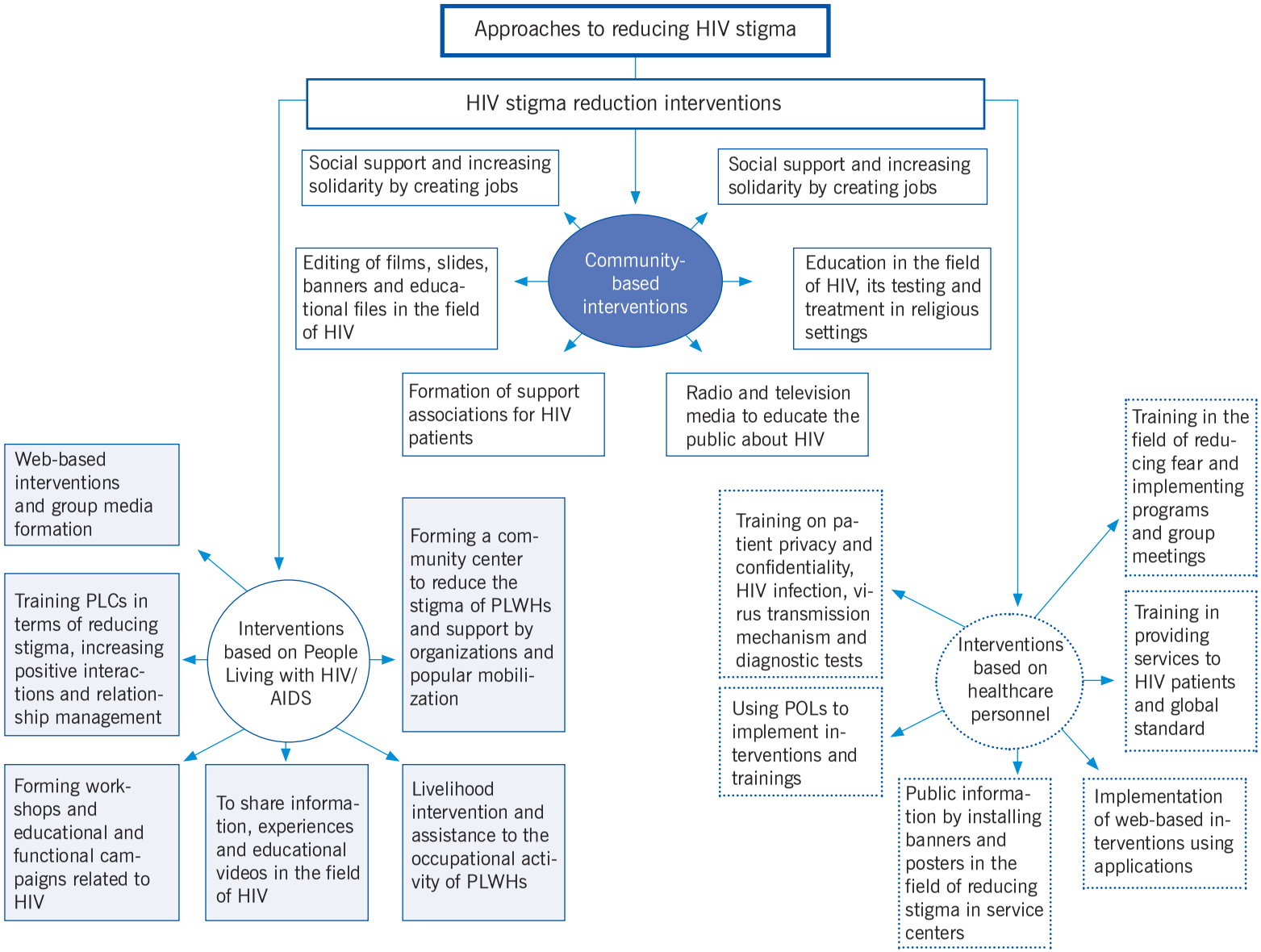

Figure 2. Concept map, approaches to reduce the stigma caused by HIV

Discussion

According to the results of the present systematic review, interventions of stigma reduction working based on populations, providers of health services and PLWHs covered the elimination of the shame and concealment of the disease through normalizing the malady and allaying fear through education and intervention programs in the society; opening up opportunities for the provision of economic, social and cultural supports by the communities and their prominent members; education provided by health staff, religious leaders and notable people about HIV and taking necessary measures for the participation of the infected people in religious programs and meetings; formation of associations that support PLWH plus the employment of radio, television and web-based applications to educate the general society of PLC and PLWH; running workshops and educational and operational campaigns related to HIV; living interventions and facilitating the employment of PLWH; forming associations for the reduction of the stigma associated with PLWH; and supports provided by organizations, leaders and popular mobilization. In a review study by Andersson *et al*., PLWHA-based interventions included radio educational programs, provision of home-based health and medical care and family support, recruitment of affected people to income-generating activities, understanding HIV, strong interpersonal relationships, management of conflict and discrimination, setting up peer support groups, building small support teams, education, group-based behavioural interventions and social support. These factors reduced stigma and enhanced the living quality of these people.[53] In the review study by Ma et al., which dealt with the interventions of stigma reduction in PLWHA and their families, interventions fell into five categories: 1- Psycho-educational interventions, 2- Supportive interventions for encouraging patients to comply with treatment, 3- Psychotherapy interventions; 4- Narrative interventions; and, 5- Social partnership interventions.

The following studies covered psycho-educational interventions: education about safe behaviour, management of negative emotions, building support networks, acquiring skills of stress alleviation, reduction of stigma, calming down, anger management, decision-making skills, self-efficacy and social relationships. In terms of compliance with treatment, the goals were removing obstacles to treatment, improving access to treatment, and providing financial, nutritional, informational, and emotional support. In the area of psychotherapy, people underwent psychological and behavioural treatments. Concerning the narrative, the patients explained how they contracted the disease and the events they encountered; finally, the interventions conducted regarding social participation stressed the interaction among PLWHA, family and community. In their review, Feyissa *et al.*[2] investigated the approaches to stigma reduction based on healthcare providers. Therefore, the components of stigma reduction fall into five categories: information-based, skills-building, structural, contact-based and biomedical interventions. These interventions were conducted as approaches providing information verbally and in writing through speeches, putting up banners and printing posters about acquiring further information on HIV and reducing stigma; a structural approach including the availability of safety and prevention equipment and related instructions, interaction strategies like activities and encouraging health workers and PLWHA to communicate; and interventions including testing, treatment and access to health care. In Mak et al. meta-analysis study, educational interventions had led to a decrease in knowledge and negative attitudes towards HIV and the caused stigma.[22]

Thapa *et al*.[55] assessed a conceptual framework to examine the impact of interventions conducted to reduce HIV stigma on HIV testing. Therefore, the interventions were divided into four approaches: building awareness and knowledge, effect on normative behaviour, provision of support, and

drafting regulatory laws. Within the awareness-building approach, effective HIV-related knowledge and norms are expanded in PWLHA and community members. In the standard behaviour approach, the attitudes and behaviours that cause stigma and the views of members of society about HIV are changed (normalized), and subsequently, more people are attracted to taking HIV tests. The approach of supporting and developing regulatory law strategies illustrates that various social and individual factors impact the mechanisms of stigma reduction; furthermore, social and legal interventions influence the implementation of the items mentioned above.[54] In their review, Stangl *et al*.[56] divided the factors affecting the reduction of stigma into four areas: 1- Information-based devices such as brochures, posters, and lectures; 2) Skill generation such as participatory learning sessions or role-playing to lower the rate of negative knowledge and attitudes; 3) Counselling and supporting like building support groups for PLHIV; and, 4) Communication with suffering groups like the interaction between PLHIV and the public. The review study by Mahajan et al. about the stigma caused by HIV maintains that stigma is widely used as a facilitator for the spread of the HIV epidemic; however, facilitating the provision of preventive, laboratory, and antiretroviral treatment services prevents stigma. Therefore, interventions should be carried out in the four areas of stigma and high-risk behaviour, stigma and biomedical prevention, stigma and prevention of mother-to-child transmission, and stigma and testing and treatment.

Concerning stigma and risky behaviour, the suffering people subject to discrimination and stigma are more likely to engage in unsafe sex, risky behaviour, and concealing the disease in their sexual relationships. Thus, interventions should focus on the role of social inequalities, sexual and racial discrimination, and the reduction of risky behaviours. In the biomedical field, measures such as adult male circumcision, prevention before exposure to the virus and infection with HIV, and the use of microbicides and vaccines are the measures that restrict the spread of the epidemic. Nonetheless, the above measures, such as HIV vaccine testing and male circumcision in societies, which attach the stigma of infection to these people, lead to people's unwillingness to comply with these principles. Regarding the prevention of the mother-to-child transmission of disease, pregnant women do not want to be tested and disclose their disease status as they are afraid of the stigma, discrimination and violence from their husbands and families. Therefore, it is necessary to educate the community, pregnant women and women of reproductive age about the services provided to prevent the mother-to-fetus transmission of the disease so that the acceptability of services is improved and the stigma is reduced. According to the treatment and testing approach, an obstacle to taking an HIV test and its treatment is stigma. But on the other hand, the lack of proper access to antiretroviral treatment in countries with limited resources and the lack of facilitation of testing act as the actual driver of not taking tests and applying for treatment. For instance, people with advanced HIV/AIDS who have clinical symptoms can no longer work; they also experience serious stigma. Therefore, treatment of these people and reduction of clinical symptoms allow these people to return to a productive social and financial life. Overall, the facilitation of HIV testing and treatment can turn this disease into a curable, chronic disease; the stigma caused by it can also be reduce. In addition, it is widely acknowledged that education plays a crucial role in mitigating the stigma surrounding HIV globally. Therefore, various approaches should be employed to present the message in different contexts. The target groups can also affect these conditions; that is, the type of training can differ depending on the illness and circumstances at that particular time. As a result, virtual education should be given more importance during the COVID-19 pandemic and effective methods should be used to implement it, such as developing an easily navigable platform for the general public. Previous research has shown that conditions prior to the pandemic were different.

because of the numerous impacts COVID-19 has had on practically every organ in the body, including the liver, kidneys, lungs, eyes, and so forth. Virtual classes are important because, quite naturally, people's fear of getting this virus can make them avoid attending training sessions in person.[57-65]

In general, the conducted studies have introduced various approaches to reducing the stigma caused by HIV; they also evaluated these approaches as interventions in different communities. Having an objective assessment of the condition and performance of AIDS patients and the attitude of nurses in relation to the insight, customs and norms of patients with AIDS is effective in making the right decisions in interacting with patients. Due to limitations in time, resources and performance, nurses need to benefit from the best evidence-based resources to improve their skills, and the results of review studies are very effective to improve knowledge and implement appropriate approaches to reduce stigma. The present research elaborated on these interventions and summarized them. However, the stigma cannot be controlled only by intervention in a specific group or population; diverse factors influence it in communities, families, suffering people and the policies related to prevention, diagnosis and treatment facilities. Besides, complex relationships exist among them, and as noted earlier, these factors have mutual effects in many cases. People with HIV will be deprived of a normal life, high-quality living, life expectancy and treatment enjoyed by all people suffering from other chronic diseases. The prevention and control of this epidemic will not be possible unless the interventions described above are implemented as a general policy in societies.

Limitations. Limitations of the study include 1- Not using the same tool to check the reduction of stigma in studies; 2- Examining populations with different economic and social conditions; 3- Selection of diverse control groups in studies; and 4- Conduction of studies in different times, and the possibility of the effect of therapeutic, cultural and social developments on the studies.

Conclusion. The stigma associated with HIV is a significant obstacle to treatment, life expectancy and living quality of patients. Therefore, the education of society, healthcare service providers, and afflicted people can reduce the stigma caused by this disease and raise the living quality of patients. Furthermore, economic, social, cultural, and psychological support can reduce the stigma of this disease and increase the living quality of the patients. Thus, it is recommended to conduct educational interventions within laws, instructions and programs in communities, health and medical and educational centres so that people suffering from this disease can enjoy a quality life.

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Patient Repositioning during Hospitalization and Prevention of Pressure Ulcers: a Narrative Review

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Review

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Patient Repositioning during Hospitalization and Prevention of Pressure Ulcers: a Narrative Review

Abstract

Objective. This article presents a literature review to explore and analyze the current situation of pressure ulcers or lesions or decubitus ulcers, pathophysiological, epidemiological aspects, and risk factors. The progress in evidence of the effectiveness of preventive repositioning in the appearance of these lesions in vulnerable hospitalized patients is also evaluated. **Methods.** Databases were reviewed in non-systematic manner, including the Cochrane Wounds Specialized Register; Medline, Scopus, PubMed, the Cochrane Central Register of Controlled Trials; MEDLINE (Ovid); EMBASE (Ovid), Web of Science, SciELO, and Lilacs. The general search terms included [pressure ulcers or pressure lesions or decubitus ulcers] and [prevention or preventive] and [repositioning or positioning or position changes or postural change] and [patient at risk or vulnerable] and [hospitalized or ICU or intensive care].

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Systematic literature reviews, randomized clinical trials, observational studies, cost-effectiveness and qualitative studies in English or Spanish were included. **Results.** Although globally, the incidence, prevalence, and years of disability associated to these lesions has diminished between 1990 and 2019, the high impact on health persists. Evidence found on the effectiveness of repositioning in preventing pressure ulcers and health associated costs has been evaluated with certainty between low and very low, as a result of conducting research with serious methodological limitations that report results with high inaccuracy. **Conclusion.** The findings reported present that these lesions persist at hospital level and continue being a global social and health problem with high impact on health budgets. Likewise, there is a need to develop greater quality research on prevention strategies, such as repositioning, which validate their effectiveness, and justify their use.

Descriptors: pressure ulcer; moving and lifting patients; prevention & control; nursing.

Reposicionamiento de pacientes en hospitalización y prevención de úlceras por presión: una revisión narrativa

Resumen

Objetivo. Este artículo presenta una revisión de la literatura con el objetivo de explorar y analizar la situación actual de las úlceras o lesiones por presión o úlceras por decúbito, aspectos fisiopatológicos, epidemiológicos, y factores de riesgo. Se evalúa además el progreso en la evidencia de la eficacia del reposicionamiento preventivo en la aparición de estas lesiones en pacientes vulnerables hospitalizados. **Métodos.** Se revisaron bases de datos de forma no sistemática, incluyendo The Cochrane Wounds Specialised Register; Medline, Scopus, PubMed, the Cochrane Central Register of Controlled Trials; MEDLINE (Ovid); EMBASE (Ovid), Web of Science, Scielo, y Lilacs. Los términos de búsqueda generales incluyeron [úlceras por presión o lesiones por presión o úlceras por decúbito] y [prevención o preventivo] y [reposicionamiento o posicionamiento o cambios de posición o cambio postural] y [paciente en riesgo o vulnerable] y [hospitalizado o UCI o cuidados intensivos]. Se incluyeron revisiones sistemáticas de la literatura, ensayos clínicos aleatorizados, estudios observacionales, estudios de costo-efectividad y cualitativos en idioma inglés o español. **Resultados.** Aunque globalmente la incidencia, prevalencia y años de incapacidad asociado a estas lesiones ha disminuido entre 1990 y 2019, el impacto en salud persiste de forma elevada. La evidencia encontrada sobre la eficacia del reposicionamiento en prevención de úlceras por presión y costos asociados en salud ha sido evaluada con certeza entre baja y muy baja, como resultado de la realización de investigaciones con serias limitaciones metodológicas que reportan resultados con alta imprecisión. **Conclusión.** Los hallazgos reportados

presentan que estas lesiones persisten a nivel hospitalario y continúan siendo un problema social y de salud mundial con alto impacto en los presupuestos en salud. Así mismo se presenta la necesidad de desarrollar mayor investigación de calidad en estrategias preventivas como el reposicionamiento, que validen su eficacia, y justifiquen su utilización.

Descriptores: úlceras por presión; prevención & control; movimiento y levantamiento de pacientes; enfermería.

Reposicionamento de pacientes na internação e prevenção de úlceras por pressão: uma revisão narrativa

Resumo

Objetivo. Este artigo apresenta uma revisão da literatura com o objetivo de explorar e analisar a situação atual das úlceras por pressão ou úlceras de decúbito, os aspectos fisiopatológicos e epidemiológicos e os fatores de risco. Também avalia o progresso na evidência da eficácia do reposicionamento preventivo no desenvolvimento dessas lesões em pacientes hospitalizados vulneráveis. **Métodos.** Foram revisados bancos de dados não específicos do local, incluindo The Cochrane Wounds Specialised Register; Medline, Scopus, PubMed, Cochrane Central Register of Controlled Trials; MEDLINE (Ovid); EMBASE (Ovid), Web of Science, Scielo e Lilacs. Os termos gerais de pesquisa incluíram [úlceras de pressão ou lesões por pressão ou úlceras de pressão ou úlceras de decúbito] e [prevenção ou preventivo] e [reposicionamento ou posicionamento ou mudanças de posição ou mudança postural] e [paciente em risco ou vulnerável] e [hospitalizado ou UTI ou terapia intensiva]. Foram incluídas revisões sistemáticas da literatura, ensaios clínicos randomizados, estudos observacionais, estudos de custo-efetividade e qualitativos em inglês ou espanhol. **Resultados.** Embora, em geral, a incidência, a prevalência e os anos de incapacidade associados a essas lesões tenham diminuído entre 1990 e 2019, o impacto na saúde continua alto. As evidências encontradas sobre a eficácia do reposicionamento na prevenção de úlceras por pressão e os custos de saúde associados foram avaliadas com certeza baixa a muito baixa, como resultado de pesquisas com sérias limitações metodológicas que relataram resultados altamente imprecisos. **Conclusão.** Os resultados relatados mostram que essas lesões persistem em nível hospitalar e continuam a ser um problema social e de saúde global com alto impacto nos orçamentos de saúde. Também há necessidade de mais pesquisas de qualidade sobre estratégias preventivas, como o reposicionamento, para validar sua eficácia e justificar seu uso.

Descritores: úlcera por pressão; movimentar e levantar pacientes; prevenção & controle; enfermagem.

Introduction

Pressure ulcers (PU), decubitus ulcers (DU) or also denominated pressure lesions (PL) are formed on the skin as consequence of gravity pressure between two hard planes (bony prominences of the person and hard support on which the patient's body lies), under specific conditions and during prolonged periods of time.[1] The outcomes of these lesions affect the quality of life of individuals, while increasing hospital costs and health system expenditure.[2-4] Although considered preventable, PU/PL/DU affect between 30% and 50% of patients assessed with high risk and constitute between 10% and 50% of all adverse hospital events.[1,5,6] The existence of Clinical Practice Guides (CPG) for their prevention and management with limited recommendations related with weakness of the evidence that supports them, does not facilitate effectively reducing the problem.[7-10] Among the interventions reported in the CPG that best support effectiveness in preventing PU/PL/DU there are use of anti-decubitus mattresses, use of gels during surgery, and use of protective sponges in the sacral region. Other interventions, such as using dressings, moisturizing creams, use of pressure-reducing pads and scheduled repositioning are carried out empirically with little evidence about their effectiveness.[7-10]

Postural change, or also called bodily repositioning, is considered a preventive-use intervention in the appearance of these lesions that has been used historically by nursing for nearly 200 years.[11] This practice has migrated over time with various denominations, like mobilization, positioning, position change, and body rotation, to refer to the same action of release body areas to prevent tissue ischemia. The term repositioning emphasizes on the frequency of change and the term repositioning practice, which is the most up to date, refers to the planning of changes (hourly frequency) conducted by caregivers, bearing in mind the degree of risk individuals may have due to their clinical condition.[12-16]

The start of position changes must be programmed in patients with high risk of injury, that is, those with a series of determining factors, like the inability to move on their own, with complete dependence on a caregiver to move, or required to remain in bed without moving, for example, those with spinal cord injuries, in hospitalization services, or those in critical state and who are under sedation.[3] Among the changes reported, there are body rotation from a supine position, laying down [with or without elevation of the head of the bed to 30° or 90° inclination] towards the right lateral or left lateral position, planned for serial periods of time.[11,17-19]

Although it is known that not moving patients increases the probability of onset of these lesions in patients at risk, the effectiveness of postural changes with frequency less than or equal to every 2 h is unknown (high frequency)

compared with postural changes performed with lower frequency every 4, 6, or 8 h (low frequency) in 24 h, in diminishing the risk of developing a PU/PL/DU.[12] This article presents a literature review to explore and analyze the current situation of the PU/PL/DU, pathophysiological, epidemiological aspects, and risk factors. Likewise, this review evaluates the progress of the scientific evidence reported on the effectiveness of preventive repositioning on the appearance of PU/PL/DU during the practice of caring for hospitalized vulnerable patients.

Methods

A narrative review[20] was structured of the current state of the literature about repositioning as prevention strategy in adult population on the appearance of PU/PL/DU. The search and the bibliographic review was conducted by the very authors, bearing in mind the following attributes: (a) health impact of the PU/PL/DU, description of the physiopathology and the determining factors for the formation of these lesions, (b) repositioning and description of the repositioning interventions applied, (c) immobility and presence of lesion, and (d) impact of repositioning on the prevention of PU/PL/DU. Despite it being a narrative review, the authors report having explored several databases, like the Cochrane Wounds Specialized Register; Medline, Scopus, PubMed, the Cochrane Central Register of Controlled Trials; MEDLINE (Ovid); EMBASE (Ovid), Web of Science, SciELO, and Lilacs, including studies from the last 6-7 years, although for historical data and epidemiological foundation, we include older reviews. The general search terms included [pressure ulcers or pressure lesions, or decubitus ulcers] and [prevention or preventive] and [repositioning or positioning or position changes or postural change] and [adult patient at risk or vulnerable] and [hospitalized or intensive care]. The specific terms with which were combined for the exploration of each objective included incidence or prevalence, physiopathology, risk factors, complications, costs, effectiveness, efficacy, impact. The related articles of preference were systematic literature reviews, randomized clinical trials, observational studies, cost-effectiveness studies, and qualitative studies, in English or Spanish.

Results

Theme 1: Pressure ulcers/pressure lesions/decubitus ulcers: Impact on Health

The PU/PL/DU are currently included among cutaneous ulcers or lesions related with states of dependency and immobility also associated with other concomitant factors, like advanced age, low tissue perfusion, and nutritional alteration.[7] This review kept in mind the terms PU/PL/DU, which are still used to report these lesions globally. The assessment of the rate of PU/PL/DU is considered an indicator of the installed safety and quality of care programs aimed at high-risk patients evaluated in hospitals and health centers.[21] The high incidence and prevalence of these lesions affects in terms of cost per treatment to patients, society, health services, and assurance systems, which are higher than the costs of health prevention.[21]

Globally, it is estimated that their prevalence in adult population is from 5% to 15% in hospitalized patients, with higher prevalence in intensive care units (ICU) between 15% and 25%.[22] A systematic review and meta-analysis of global prevalence and incidence of PU/PL/DU, which included cross-sectional and longitudinal studies conducted in hospitals in Asia, Australia, Europe, the Middle East, North America, and South America (surgical, medical and from ICU) between 2008 and 2018, reported calculated pooled prevalence of 12.8% (95% CI 11.8-13.9), a combined incidence rate of 681 885 patients was of 5.4 per 10 000 patient-days (95% CI: 3.4–7.8), and the combined rate of hospital-acquired pressure injuries (HAPI) of 1,893,593 was 8.4% (95% CI: 7.6–9.3%).[23]

More profoundly, another study, the Global Burden of Decubitus study,[24] presents an epidemiological evaluation by integrating changes in prevalence, incidence, and years of life with disability (YLD) for PU/PL/DU between 1990 and 2019 globally, in hospitalized population. It included for the analysis 369 diseases and lesions, 282 causes of death, and 84 risk factors in 204 countries. The analysis used 7 333 national vital registration systems and 24 657 subnational; 16 984 published studies and 1 654 follow-up household surveys.[25]

Table 1. Global changes and in Colombia of Incidence, prevalence, and years of life with disability due to PU/PL/DU between 1990 and 2019[25]*

Global and in Colombia	1990		2019		Percentage of change in ASR between 1990 and 2019 per 100 000 inhabitants
	Cases (95% UI)	Rate (95% UI) per 100 000 inhabitants	Counts (95% UI)	Rate (95% UI) per 100 000 inhabitants	
Global Prevalence	417 024 (375 180 to 462, 07)	12.6 (11.33 to 14.05)	853 854 (776 189 to 942 491)	11.3 (10.19 to 12.48)	-0.1 (-0.12 to -0.09)
Colombian Prevalence	4940 (4483 to 5426)	30.5 (27.4 to 33.68)	15 262 (13 657 to 17 106)	28.1 (25.12 to 31.25)	-0.1 (-0.12 to -0.03)
Global Incidence	1 541 945 (1 389 163 to 1 720 928)	46.5 (41.72 to 52.02)	3 170 796 (2 875 433 to 3 499 729)	41.8 (37.8 to 46.22)	-0.1 (-0.12 to -0.08)
Colombian Incidence	18 268 (16 662 to 20 169)	113.2 (101.61 to 125.72)	57 068 (51 028 to 64 099)	105.1 (94.12 to 118.02)	-0.1 (-0.11 to -0.03)
Global YLD	64 857 (45 376 to 85 486)	1.9 (1.36 to 2.51)	130 238 (92 478 to 171 036)	1.7 (1.2 to 2.2)	-0.1 (-0.12 to -0.08)
Colombian YLD	775 (536 to 1052)	4.6 (3.23 to 6.26)	2328 (1593 to 3147)	4.3 (2.9 to 5.8)	-0.1 (-0.2 to 0.07)

*Information taken from: Zhang X *et al.*,[25]

ASR = Age-standardized rate; YLD = years of life with disability; UI = Uncertainty Interval

The age-standardized rates of prevalence, incidence and years of life with disability (YLD) in 2019 were 11.3 (95% UI 10.2 to 12.5), 41.8 (95% UI 37.8 to 46.2), and 1.7 (95% UI 1.2 to 2.2) per 100-thousand inhabitants, respectively. The study reported a global decrease compared with data from 1990 of 10.6% (95% UI 8.7% to 12.3%) for incidence, 10.2% (8.2% to 11.9%) for prevalence, and 10.4% (8.1% to 12.5%) for YLD (Table 1). Additionally, the global prevalence and incidence rates of the PU/PL/DU increased with age, reaching their maximum point in the age group of 95 years.[25] The highest prevalence rates per 100-thousand inhabitants standardized by age are reported in the countries included in the high-income region of North America [USA, Canada] (34.6 [31.9 to 37.6]), Latin and Central America [Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Venezuela] (27.4 [24.6 to 30.4]), and Tropical Latin America [Brazil, Paraguay] (24.3 [22.2 to 26.8]).[25] Colombia, despite being among the countries with high prevalence, incidence, and high rate of years of life with disability, is also

among the countries that show a decrease in these events.

Surveys conducted in hospitals in Colombia have reported that the PU/PL/DU of higher prevalence are those Grades I and II (30%), followed by stages III and IV (11%); with greater location in the sacral area (24%), trochanters (19%), glutes (11%), elbows (8%), malleoli and heels (6% each). The most affected patients are those in critical condition hospitalized in internal medicine services (41%), orthopedics (8%), and in ICU services (7%).[26]

The magnitude of these lesions increases health costs generated as consequence of their complications, among which infection is most frequently observed, which can lead to a prolonged hospital stay and death.[3-5] Approximate data obtained from several studies have estimated that the total cost of managing a PU/PL/DU, which includes materials, increased bed days, and medications, ranges between $2.2 and $3.6 billion USD/year [Ulcers grade I $12 USD, grade II $373 USD, grade III $3 222 USD, grade IV $66 834 USD).[27,28] However, information about the cost per event/patient and annual per countries is very heterogenous, with methodological limitations related with the way of obtaining and analyzing the data. Table 2 shows the data found per countries identified in the literature.[29-42]

Regarding prevention, the use of strategies aimed at this purpose has shown a cost-patient savings of up to $2 500 USD and of approximately $7276 USD in the total cost of care.[25,27] Uncertainty exists about the strategies for effective repositioning practice in reducing lesions, and few studies have reported costs for repositioning (Table 3).[27,37,39,44,45]

A study about costs related with postural changes to prevent PU/PL/DU reported a repositioning price per minute of 0.58 € (equivalent to $0.63 USD).[28] Furthermore, it was shown that the time invested in the preventive repositioning of a patient without any of these injuries is less (7.9 min.) than the time invested in the repositioning of patients with PU/PL/DU (10.4 min.). This is equivalent to a cost of 4.6 € ($5.05 USD) for preventive repositioning (without ulcer) and a cost of 6.0 € ($6.58 USD) for repositioning as part of the treatment of patients who have developed an ulcer.[28,29] The clinical trial proposed by Moore *et al.*,[44] compared the incidence of PU/PL/DU and the cost associated with two types of repositioning frequencies at 30 grades° head of bed elevation (30° of inclination tilt). The results showed a lower difference of PU/PL/DU in the group intervened compared with the control group (3% vs. 11%, RR 0.26, 95% CI 0.078-0.90, respectively). The cost per ulcer-free patient was 213.9 € in the group intervened and 283.3 € in the control group. However, these results must be contrasted with other clinical trials of greater magnitude to validate their generalizability.[44]

Table 2. Approximate cost of PU/PL/DU

Country	Year	Individual cost	Annual/ biannual cost	Cost according with grade of lesion
Chile[29] (USD)	2020	-	Biannual 2018 19 558	-
Iran[30] (USD)	2019	Grade 1: USD $12 to Grade IV: $66,834	519 991	-
Colombia[31] (Colombian Pesos)	2018	$84 519	Biannual 369 178 992	-
Canada[32] (Canadian Dollar)	2017	$26 800 to $233 000 Increased nursing hours: 50%	-	-
Spain[33] (Euro, €)	2017	-	461 million	-
Singapore[34,35] (Singapore Dollars)	2016	$4546 to $33 138	-	-
Australia[36] (Australian Dollars, UD)	2015	$930 million for PU/PL Loss according to bed days: $820 million 525 000 bed days	1.8 billion	Grade I: $747 Grade III: $17 442 Grade IV: $22 467
Belgium [37] (Euro, €)	2015	-	4 857 854	Grade I: $67.7 Grade II: $368.4 Grade III: $1,276.3 Grade IV: $2,507.9
New Zeland[38] (USD)	2015	-	694 million	
USA [39] (USD)	2000-2012	$ 500-$15 200	11.6 billion	Grade I/II: $2770 Grade III/IV: $5630
United Kingdom, UK[40] (Pound sterling, £)	2012	Per day: £ 43 to 374 (Grade I/II) £ 57 to 343 (Grade III/IV)	3.36 million	Healing cost: Grade I: $1214 Grade II: $5241 Grade III: $9041 Grade IV: $14 108
Germany[41] (Euro, £)	2012	991 (52/day)	1.3 billion	
Ireland[42] **(**Euro, £)	2005	119 000	£ 250 million	-

Table 3. Costs of preventive repositioning for PU/PL/DU

Country	Year	Cost Day/patient
USA[39] (USD)	2019	$867
Australia[27] (Australian Dollars)	2016	$98.90
Belgium[37] (€)	2015	$7.88 (SD $8.21)
Brazil[45] (Brazilian Real)	2015	$5.38 (SD $6.57) to $8.15(SD $5.8) $31.04 total mean
UK[44] (€)	2013	$287.3 Nursing cost: $25 310

Theme 2: Pathophysiology and determining factors of their formation

The PU/PL/DU are formed as consequence of ischemic necrosis on the skin and subcutaneous tissue, secondary to increased pressure exerted on any of the bony prominences (such as the sacrum, trochanters, scapulae, heels, and elbows, among others) in immobile patients, elderly adults, and those with greater fragility.[1] Under normal conditions, maximum capillary pressure is around 20 mmHg and mean tissue pressure varies between 16 and 33 mmHg; however, the presence of pressure higher than these in a given area and exerted for a long time generate the risk of increased ischemic processes that progress up to tissue necrosis.[43] Subjecting the tissue to greater compression is directly related to diminished blood flow (damage to microcirculation that decreases oxygen delivery), generating ischemia of the vascular membrane, vasoconstriction in the area, with initial erythema characteristic of PU/PL/DU, in addition to extravasation of fluids and cellular infiltration in the area. If said pressure does not diminish and remains so for a sustained time > 2 h, venous thrombosis is generated ending in cell death, necrosis, and ulceration of the tissue.[7,46]

The different stages of PU/PL/DU are described from slight to severe (I-IV, and other undetermined stages), depending on the degree of involvement in the skin and subcutaneous tissue.[6,7]

Multiple studies have described the factors associated with the onset of PU/PL/DU. The existence of extrinsic factors is related to the appearance of PU/PL/DU, among these factors are rubbing, friction, increased surface temperature and body humidity or of the area at risk.[47-51]

The extrinsic factors were reported in the systematic review by Lima-Serrano *et al.,*[47] which condenses the findings obtained from 17 studies, and the description of the determining factors of PU/PL/DU observed in 19,363 patients hospitalized in different ICUs. The results reported that age ≥ 65 years (OR 2.14, 95% CI 1.27-3.62) and presence of diabetes (OR 5.58, 95% CI 1.58- 18.7) were the two determining factors of higher prevalence of these lesions. In this same study, the factors of higher prevalence related with care were the duration or permanence for long periods of time with an average arterial pressure < 60-70 mmHg (OR 1.09, 95% CI 1.02-1.17), being exposed to mechanical ventilation (OR 23, 95% CI 6.42-86.6), receiving continuous veno-venous hemofiltration treatment, or intermittent dialysis (OR 3.7, 95% CI 1.03-13.86), and having treatment with sedatives (OR 1.02, 95% CI 1.01- 1.03). Likewise, this systematic review identified that in terms of care, performing few postural changes was associated with higher presence of PU/PL/DU (OR 3.63, 95% CI 1.09-12.05).

Regarding postural changes, some studies have reported a higher PU/PL/DU trend in patients who are moved between 4 to 6 times per day (OR 3.63, 95% CI 1.09-12.0), that is, approximately every 4 h in 24 h with a probability of 2.96 for developing Grade II PU/PL/DU (95% CI 1.23-7.15).[48-50]

Theme 3: Repositioning in prevention of PU/PL/DU

Postural changes are interventions to prevent PU/PL/DU, which have remained as conventional part of the care patients throughout history. Although it is a valid intervention, it still lacks sufficient evidence to support its effectiveness associated with the frequency of position changes in immobile patients. Postural changes are defined as body repositioning practice regimens performed to redistribute and release the pressure exerted between the body and the support surface upon which the patient is located, including body rotation in lying position, accompanied by elevating the bed angle.[51,52] It has been found that the 90° lateralized supine position for more than 2 h decreases blood flow and leads to very low oxygen levels (close to anoxia levels); and positioning patients laterally with a 30° inclination improves transcutaneous oxygen levels, favoring the prevention of these ulcers on the skin and other complications associated with immobility, such as pneumonia, muscle contractures, deconditioning, or urinary tract infections.[52]

Bodily rotation or repositioning strategies may be manual or mechanical; the latter have been implemented with technological progress in health care. Manual body repositioning has traditionally been performed with time intervals (high frequency every 2 h or lower frequency every 4, 6, or 8 h).[51] However, much uncertainty still exists about which could be the best repositioning frequency with the best benefit for the patient. Current research evidence that mobilization carried out with intervals every 2 h diminishes pressure time over the soft tissue and, likewise, a decrease on the damage generated on the blood capillaries. This practice is performed in distributed and organized manner when the patient is changed from supine position to lateral position (right or left) and back to supine position.[52] Other elements, such as support surfaces or pads, are helpful in applying this intervention.[7,12]

Repositioning performed by alternating pressure air surfaces (also called active distribution mattresses) can reduce the incidence of PU/PL/DU compared with foam surfaces, however, the certainty of the evidence is low in terms of cost effectiveness.[53] Overall, these surfaces allow the release of pressure in specific body zones through automatic and continuous programming, but they partially mobilize the patient in bed. Some of these devices are a combination between specialized beds and lateral repositioning mattresses, which can diminish the work burden of nursing professionals.[53] Currently, the use of devices that monitor the frequency of repositioning has also been added. These are portable sensors that can be attached to patients in ICU and use artificial intelligence to program mobilization alarms. The use of sensors has shown that, when used, these warn about the moment when a patient must be repositioned, allowing the evaluation of caregivers' adherence to mobilization protocols. In addition, a reduction in the appearance of PU/PL/DU is evident, although said sensors have not yet been fully commercialized in developing countries.[54]

Theme 4: Relationship between immobility and formation of PU/PL/DU

A relationship exists between the development of PU/PL/DU and loss of independence in spontaneous and autonomous mobilization of individuals. Patients who reposition themselves develop less ulcers, and some studies have observed that a traditional mobilization frequency of every 2-3 h could be an option in reducing these lesions.[18] However, in the current and routine practice conducted by the nursing staff, this interval has been increasing (lower mobilization frequency per shift), becoming an additional factor for the development of PU/PL/DU.[53] These failures in reducing the frequency of position changes can be explained by administrative-type factors, related with health costs, like, for example low ratio of nurses per number of patients, limited type and number of beds with specialized mattresses to prevent PU/PL/DU, lack of adequate hospital prevention elements, higher complexity of patients, but above all the

existence of limitations in the evidence about the effectiveness of repositioning and prevention interventions.[55,56]

Some studies suggest that the repositioning interval could be every 3-4 h, using pressure redistribution mattresses, a technology that depends very little on the decision of caregivers and increases hospitalization costs.[6,55,56] However, mobilization frequencies with greater time intervals (3 h, 4-5 h) seem less like the natural (or, one might say, normal) frequency of position changes that an adult individual makes during sleep, state in which individuals move according with their individual needs [at least once/hour during a 7-h sleep period].[56-58] This could influence on the intervention, but perhaps more importantly, could also indicate the need for a higher repositioning frequency in patients who cannot make spontaneous movements independently (*e.g.,* patients with spinal cord injury at cervical level or exposed to sedation in the ICU). Although repositioning is often associated with the prevention of PU/PL/DU, it is also important to minimize other types of problems related with prolonged immobility, such as spasticity, muscle rigidity, lack of sensory input, orientation and relationship with the environment, awareness of body image, while minimizing respiratory and vascular complications.[58]

Some factors favor the appearance of these lesions in patients with immobility and dependence on caregivers. The use of medications or treatments with sedatives and analgesics are factors associated with the appearance of PU/PL/DU, given that these reduce sensitivity to pain caused by the prolonged stay in the same position. Further, repositioning may be determined by medical prescription of immobilization in special cases, such as hemodynamic instability, presented by some patients in critical state.[56] In the usual hospital care and ICU practice the repositioning frequency is normally applied in the morning or afternoon shifts, but this mobilization is reduced during the night shifts.[56-58] Reduction in the frequency of position changes during the night may be explained by the premise of respecting the circadian sleep cycle, or due to the lack of available care staff, or only due to patient hygiene reasons, considerably increasing the level of risk of injury.[56]

The impact of the frequency of mobilization carried out per shift (day-night) on the appearance of injuries is still unknown, although the description of these factors is based on observations by caregivers, it must be considered when planning the patient repositioning program.

Theme 5: Some progress about the impact of repositioning

The limitations on the evidence about repositioning include research related with turning times, body elevation angle, or optimum manual repositioning. An observational study conducted in 1999, the first related with nursing research, analyzed in adult population three turn groups (every 2 to 3 h [n = 32], every 4 h [n = 27], or between 2 and 4 times per day [n = 41]), observing that elderly adults who were repositioned every 2 to 3 h had less ulcers.[59] This historical study created the gold standard that would support the practice of mobilization every 2 h in vulnerable patients. Conversely, a study carried out some years later by DeFloor *et al*., suggested that depending on the support surface used (for example, viscoelastic surface in mattresses), less frequent turning could be optimal to prevent PU/PL/DU in patients hospitalized in long-term care facilities.[60] However, these findings have been questioned by other authors, who have suggested that it may be too soon to abandon the mobilization routine of every 2 h in favor of every 4 h based on this study.[61,62]

The systematic review by Gillespie *et al*.,[63] to assess the clinical and cost-effectiveness aspects of repositioning to prevent PU/PL/DU in adult population, included eight clinical trials conducted in diverse hospitalization services. It analyzed 3,941 patients included in the clinical trials evaluated; however, only three clinical

trials (including 1,074 patients) compared the 2-h repositioning frequency against every 4 h on the onset of PU/PL/DU. The results showed non-significant differences between both interventions (Relative risk 1.06, 95% CI 0.80 to 1.41, I^2 45%). This review also identified two studies (with 252 participants) that compared two types of bed repositioning (30 degrees versus 90 degrees of inclination) in the reduction of PU/PL/DU. The results showed no significant differences between both interventions (Relative risk 0.62, 95% CI 0.10 to 3.97, I^2 69%).

Discussion

The literature synthesis provides a global sample of the current state of PU/PL/DU developed by adults during hospitalization; a health situation that continues being of great magnitude and which affects patients, their families, society, and health systems in general. Furthermore, a review is presented of the pathophysiological aspects and determining factors that lead to their formation. Finally, a prevention intervention is explored, like repositioning or position changes in preventing these lesions and the scope of the evidence in terms of effectiveness at hospital level.

Among the most-relevant epidemiological aspects of this review there is the existence of data that show a global reduction of the prevalence and incidence and of the YLD between 1990 and 2019.[24,25] Despite these results, Colombia still reports high PU/PL/DU rates, aspects that must be disclosed and taken into account to implement better control measures of events and of hospital prevention, with a multiple approach.[6,26]

The magnitude of these lesions increases health costs around 1.4% - 1.9% of public spending, which are generated as a consequence of their complications, mainly infections that can lead to increased hospital stay and increased mortality.[27,28] However, obtaining this information is affected by the scarce number of cost-effectiveness studies conducted in that regard and by the great heterogeneity in the methods reported. In addition, the detailed costs presented by some studies include high-cost prevention strategies, such as the use of dressings (hydrocolloid), among others, with scant evidence reported of their effectiveness.[24,27,39,40]

Repositioning, or body rotation of individuals in state of total fragility and dependence at hospital level, is a care intervention used historically and empirically to prevent PU/PL/DU. Position changes could prevent the appearance of these lesions, avoiding the development of the more complicated and costly injuries to treat: grades III and IV PU/PL/DU.[63] Although the scope of the evidence about this intervention's effectiveness is quite weak, it is known that the release of pressure on body areas contributes to better tissue perfusion, considering that these lesions can develop in less than 2 h remaining in the same position. However, to date, high-quality evidence has not been observed to permit supporting or modifying this practice.

Moreover, it is necessary to keep in mind the challenges implied to the nursing staff by using these types of interventions and which may be determinant for their application, like – for example, sufficient number of staff to carry out the rotations, support systems to control time, and use of devices to facilitate displacement during the turns.[55] Additionally, the particular conditions of the patients' diseases could also be limitations to apply these types of interventions.

Including weak evidence in CPG based on studies of low methodological quality delays progress in research related to these types of interventions. Some limitations identified within the studies available are related with the lack of blinding mainly of those who evaluated the outcomes, failures in reporting (or non-performance) of randomization, and lack of precision of the results, the context of where these took place (mostly in developed countries and ICU) that diminishes the possibility of generalizing their results to other scenarios. In turn, most of the studies had a small

sample size, which limits their power and leads to over or underestimation of results.[62,64]

In that sense, uncertainty persists regarding the adequate type and frequency for repositioning in hospitalized vulnerable patients. Currently, the nursing care plan for hospitalized patients includes position changes and its frequency lies at the discretion of each professional, bearing in mind the analysis of the multiple factors that determine the feasibility of its use. It is also not clear if the repositioning frequency should be modified during the night period considering that thus there is less spontaneous movement from the patients and, thereby, greater body pressure. Consequently, further research is needed with more-robust methodological approaches that permit obtaining valid results that guide appropriately the clinical practice.

The PENFUP phase 2 research project is a pragmatic randomized controlled clinical trial in 22 clusters [hospitals], led by nursing and funded by MINCIENCIAS in Colombia, which is finishing its development (Registry in Clinical Trials.gov NCT04604665). This project sought to assess the effectiveness of two levels of manual repositioning to prevent PU/PL/DU acquired in adult patients hospitalized in various ICUs in different Colombian cities. Being a cluster randomized clinical trial, the ICUs of the hospitals will be randomized to a high-frequency repositioning (position changes between 1-2 h of eligible patients plus reinforcement of care via telegram and SMS text message to the caregivers) or to a conventionally administered frequency repositioning, thus, allowing to evaluate the primary outcome: incidence or onset of new PU/PL/DU by ICU groups.[65] Although this study is conducted particularly in critical care settings, it is expected for its results to contribute to solving the knowledge gap related with the repositioning practice not only in this population, but to provide guidelines for the management of other vulnerable patients.

Conclusions

The narrative review performed provides valuable information about the epidemiology, costs, and the state of the research related with repositioning, a prevention intervention used for over 200 years to control the onset of PU/PL/DU in vulnerable adults during hospitalization. The literature reports that, although a decrease exists in the incidence, prevalence, and years of life due to disability due to these lesions globally between 1990 and 2019, the rate of events is still high and continues producing a high social and economic impact on health that must be mitigated. Among the interventions applied to prevent these events, there is the repositioning of patients; an intervention that is carried out empirically during patient care. Progress in research on the effectiveness of repositioning to prevent PU/PL/DU shows no differences in reducing these lesions when comparing different strategies and frequencies in position changing of patients at risk of injury. High-quality research must be promoted to determine the effectiveness and costs related with implementing preventive repositioning that leads to improving the clinical results of patients at hospital level.

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Review

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The effect of Orem self-care model on the improvement of symptoms and quality of life in patients with diabetes: A scoping review

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The effect of Orem self-care model on the improvement of symptoms and quality of life in patients with diabetes: A scoping review

Abstract

Objective: to evaluate the association of Orem self-care model improvement of symptoms and quality of life in patients with diabetes. **Methods.** A scoping review was carried on bibliographic databases: PubMed-Medline, Scopus, SID and Magiran. The inclusion criteria encompassed studies examining the impact of the Orem self-care model on diabetic patients. Studies considered

for inclusion needed to have full-text availability and be written in either English or Persian, with key words including “Models”, “Nursing”, “Quality of Life”, and “Diabetes Mellitus”. CONSORT checklist and STROBE statement were selected for quality assessment. **Results.** A total of 9 studies were included, all using quantitative methodology and focusing on adults or older adults. The majority of articles focused on quality of life and diabetic symptoms. 8 studies showed positive outcomes after implementation of the model. The findings indicate that this model led to an enhanced level of self-efficacy, improved quality of life, and better self-care practices among diabetic patients. **Conclusion.** Orem self-care model can reduce the diabetic symptoms and improve the quality of life, self-efficacy and self-care in these patients.

Descriptors: Diabetes Mellitus; models, nursing; self-care; quality of life.

Efecto del modelo de autocuidado de Orem en el mejoramiento de los síntomas y en la calidad de vida de pacientes con diabetes: Una revisión de alcance

Resumen

Objetivo. Evaluar la asociación del modelo de autocuidado de Orem en el mejoramiento de los síntomas y en la calidad de vida en pacientes con diabetes. **Método.** Se realizó una revisión de alcance empleando las bases bibliográficas PubMed-Medline, Scopus, SID y Magiran. Los criterios de inclusión abarcaron estudios que examinaran el impacto del modelo de autocuidado de Orem en pacientes diabéticos. Los estudios considerados para su inclusión debían tener disponibilidad de texto completo y estar escritos en inglés o persa, con palabras clave como: “Models”, “Nursing”, “Quality of Life” y “Diabetes Mellitus”. Se utilizaron para la evaluación de la calidad de los estudios la lista de comprobación CONSORT y la declaración STROBE. **Resultados.** Se incluyeron un total de 9 estudios, todos ellos con metodología cuantitativa y centrados en adultos y en ancianos. La mayoría de los artículos se estudiaron la calidad de vida y los síntomas diabéticos. 8 estudios mostraron resultados positivos tras la aplicación del modelo de Orem. Los hallazgos

indican que este modelo condujo a un mayor nivel de autoeficacia, mejor calidad de vida y mejores prácticas de autocuidado entre los pacientes diabéticos. **Conclusión.** El modelo de autocuidado de Orem puede ayudar a disminuir los síntomas diabéticos y mejorar la calidad de vida, la autoeficacia y el autocuidado en estos pacientes.

Descriptores: Diabetes Mellitus; modelos de enfermería; calidad de vida; autocuidado.

Efeito do modelo de autocuidado de Orem na melhora dos sintomas e na qualidade de vida de pacientes com diabetes: uma revisão de escopo

Resumen

Objetivo. Avaliar a associação do modelo de autocuidado de Orem na melhora dos sintomas e na qualidade de vida de pacientes com diabetes. **Métodos.** Foi realizada uma revisão de escopo usando os bancos de dados PubMed-Medline, Scopus, SID e Magiran. Os critérios de inclusão incluíram estudos que examinaram o impacto do modelo de autocuidado de Orem em pacientes diabéticos. Os estudos considerados para inclusão tinham que estar disponíveis em texto completo e escritos em inglês ou persa, com palavras-chave como: "Models", "Nursing", "Quality of Life" e "Diabetes Mellitus". A lista de verificação CONSORT e a declaração STROBE foram usadas para avaliar a qualidade dos estudos. **Resultados.** Foram incluídos 9 estudos, todos com metodologia quantitativa e com foco em adultos e idosos. A maioria dos artigos estudou a qualidade de vida e os sintomas diabéticos. Oito estudos mostraram resultados positivos após a aplicação do modelo de Orem. Os achados indicam que esse modelo levou a um nível mais alto de autoeficácia, melhor qualidade de vida e melhores práticas de autocuidado entre os pacientes diabéticos. **Conclusão.** O modelo de autocuidado de Orem pode ajudar a diminuir os sintomas da diabetes e melhorar a qualidade de vida, a autoeficácia e o autocuidado desses pacientes.

Descritores: Diabetes Mellitus; modelos de enfermagem; qualidade de vida; autocuidado.

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Introduction

Diabetes originates from impairment in the metabolism of proteins, carbohydrates and lipids.[1] It is a chronic metabolic disorder that is defined and recognized by the increase in blood sugar caused by defects in the secretion or action of insulin or both. This disease leads to many complications such as limb amputation, cardiovascular problems, kidney diseases, blindness, and long-term disabilities.[2] Diabetes is one of the most common non-communicable diseases that has the highest prevalence rate among metabolic diseases. More than 90% of diabetic patients suffer from type 2 diabetes. This disease is associated with short-term and long-term complications that are irreversible in many cases.[3] Complications and deaths caused by diabetes are among health problems all over the world. The increase in the number of patients with type 2 diabetes indicates a global epidemic.[4] In addition to direct complications, diabetes also has many costs that affect the lives of the patients. In 2017, 327 billion dollars was the total cost of diagnosed diabetes.[5]

The prevalence of type 1 and type 2 diabetes is increasing worldwide, but the rate of type 2 diabetes is higher than that of type 1.[6] Diabetes is a chronic condition that imposes major threats to the mankind and affected 435 million individuals in 2017.[7] It will involve 552 and 624 million patients by 2030 and 2040, respectively.[8,9] According to the International Diabetes Federation (IDF), Iran ranks third among Middle Eastern countries in terms of diabetes (5.4 million cases). It is expected that the rate of diabetes will reach 9.2 million Iranians by 2030.[10] Aging population will be another effective factor in increasing the prevalence of diabetes in the future.[11] The increase in the number of diabetic patients has faced the care provider organizations with increasing financial problems and a decrease in the number of care providers.[12] 15-20% of hospital beds are occupied by patients with diabetes and it is difficult to determine which of these patients require more medical attention.[13] Regardless of age, country and economic conditions, diabetes is a major health challenge and has a global impact, so that the prevalence of diabetes is reaching an alarming level.[14] Therefore, the prevention and control of this disease is considered one of the health challenges, so that one of the goals of the Ministry of Health, Treatment and Medical Training of Iran is to stop the spread and growth of diabetes until 2025.[15]

One of the most important clinical goals of nursing care is to reduce the severity of disease symptoms and the stress caused by it in order to improve the quality of life in these patients. Without patient participation, favorable outcomes cannot be considered. Quality of life is a crucial aspect of healthcare, particularly in the context of nursing care. The primary clinical objective for nurses is to alleviate the severity of disease symptoms and mitigate the associated stress experienced by patients. By doing so, the overarching goal is to enhance the overall quality of life for individuals undergoing medical

treatment.[16] Self-care behaviors are one of the most important components which requires special attention. These behaviors in diabetic patients includes appropriate glycemic control, following a healthy diet, taking medicines regularly, monitoring blood sugar, taking care of feet and doing sports activities.[17] Self-care behaviors are naturally multidimensional and include all the activities focused on health maintenance, disease prevention and treatment. These kinds of behaviors are done purposefully and with the consent of the patient.[18] Improving the self-care behaviors is the first step toward helping the diabetic patients. Normally, self-care practices can reduce the costs and prevent acute or chronic complications of diabetes.[19,20] Appropriate behaviors can lead to a decreased level of cardiovascular risks among diabetic patients.[21] Since self-care activities are effective in glycemic control and other outcomes in diabetic patients, it can be claimed that self-care behaviors can be an underlying reason for mortality among them.[22, 23]

One of the models that can contribute to the patient's self-care is Orem self-care model.[24] According to Orem, humans have the ability to take care of themselves, and if this ability is disturbed, nurses help them to regain this ability.[25] Understanding the impact of the Orem Self-Care Model on symptom alleviation and quality of life is crucial for healthcare professionals and policymakers. Positive findings could lead to the development of targeted interventions and strategies that enhance patient outcomes, potentially improving the overall quality of care for individuals with diabetes. The need for research on factors affecting self-care based on the needs of patients to increase their self-care ability seems necessary. Hence, this study aimed to evaluate the association of Orem self-care model improvement of symptoms and quality of life in patients with diabetes.

Methods

This scoping review adheres to PRISMA guidelines. The review was registered on PROSPERO (ID:CRD42022367809). (ID:CRD42022367809) Also, this research has been approved by the ethics committee of Behbahan Faculty of Medical Sciences (code of ethics: IR.BHN.REC.1402.002)

Search strategy. The following databases were searched: PubMed, Scopus, SID, Magiran. Articles published between 2011 and October 31, 2022 were included in the search strategy. The search included following terms: 1- Orem Self-Care Model (Text Word) OR Model, Orem Self-Care (Mesh Term) OR Self-Care Model, Orem (Mesh Term) OR Orem Self Care Model (Mesh Term); 2- Diabetes Mellitus (Text Word) OR Diabetes Mellitus, Noninsulin-Dependent (Mesh Term) OR Diabetes Mellitus, Ketosis-Resistant (Mesh Term) OR Stable Diabetes Mellitus (Mesh Term) OR Type 2 Diabetes Mellitus (Mesh Term) OR Noninsulin Dependent Diabetes Mellitus (Mesh Term) OR NIDDM (Mesh Term) OR Adult-Onset Diabetes Mellitus (Mesh Term) OR IDDM (Mesh Term) OR Type 1 Diabetes OR Autoimmune Diabetes (Mesh Term) OR Juvenile-Onset Diabetes (Mesh Term) OR Sudden-Onset Diabetes Mellitus; and 3- 1 AND 2. In order to minimize the number of missing data, Google Scholar was also searched. The search strategy was completed by snowball search (e.g., existing systematic reviews and included articles) of included studies.

Inclusion/Exclusion Criteria. The inclusion criteria were as following: Studies published in English or Persian with full text available, participants aged 10-65 years, participants with the diagnosis of diabetes mellitus at any stage of the disease. Included interventions were those that aimed to implement Orem model. Moreover, the intervention can be emanated from either inpatient or outpatient setting. Additionally, randomization may reduce the risk of bias, it may not be fully possible in health care. Hence, the studies with nonrandomized or one-group study designs were included.

The exclusion criteria were as following: interventions of models other than Orem model; intervention specifically aimed to treat homeless

patients, participants with physical or mental handicap and patients involved in forensic process. Gray literature which did not publish as articles, such as posters, organizational projects, class presentations, health messages and other similar literature did not meet the eligibility criteria.

Quality Assessment. For the assessment of observational studies, STROBE statement (Strengthening the Reporting of Observational studies in Epidemiology) was used. The statement consists of 22 items.[26] In addition, CONSORT checklist was used for the assessment of interventional studies.[27]

Data Extraction. In order to find eligible studies, titles and abstracts from databases and additional sources were assessed by two authors independently. Then, the retrieved full texts were checked by the same two authors. Any disagreement was resolved by consultation with the third author. Unavailable data was requested from study authors.

Two authors were responsible for data extraction of included studies. The following items were extracted: 1- General information (Author, publication year, reference, study type, mean age, sample size); 2- Participants; 3- Measurement tool; 4- Intervention period, 4- Control; 5- Outcome; 6- Main finding or key points.

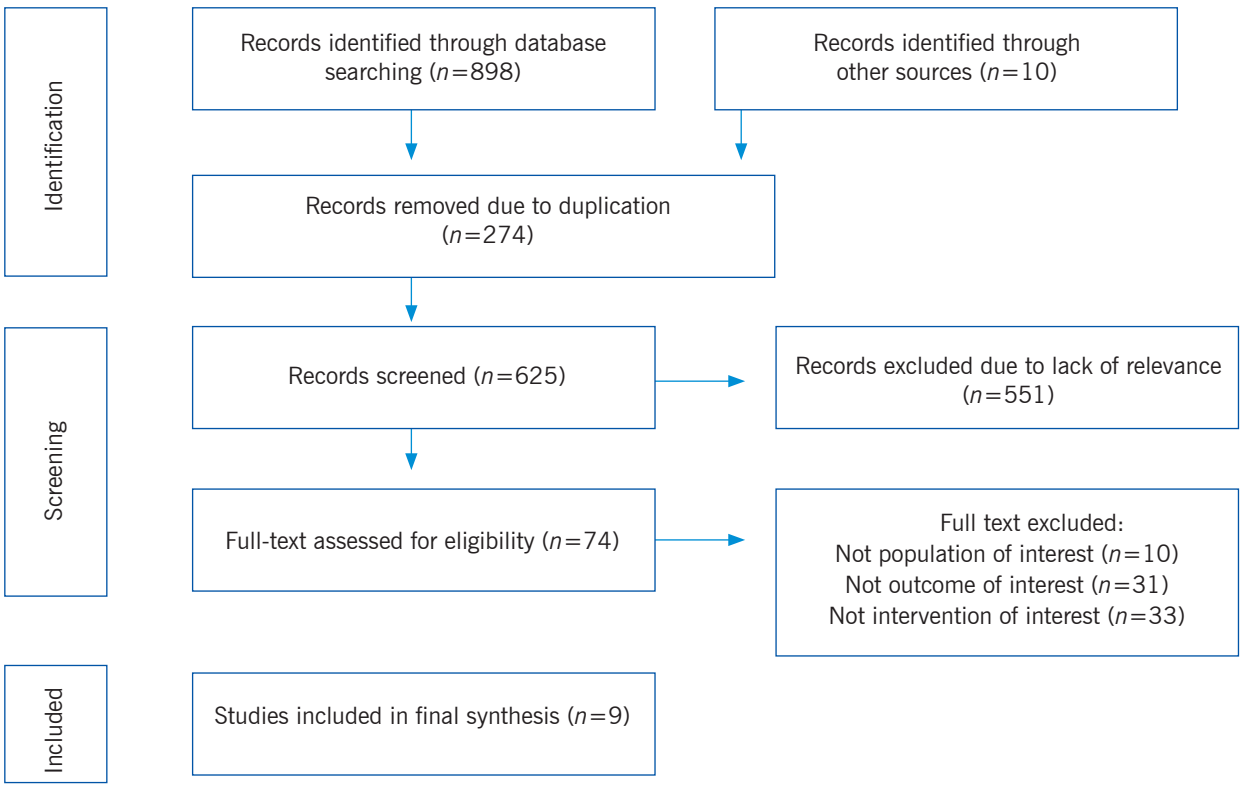

Figure 1. PRISMA Flowchart of selected studies

Results

The initial search yielded 259 records on PubMed, 226 on Scopus, 215 on SID and 189 on Magiran. After removal of duplicates, the final records were 625. By reviewing the titles, the eligible articles reduced to 321. The selection by abstract brought the total to 74. The main purpose of the study was to select the studies have examined the special association between Orem self-care model and diabetic patients. This led to a significant reduction of eligible articles. Eventually, 9 studies met the inclusion criteria and were considered. Figure 1 shows the process of study selection.

Two studies were from PubMed, whilst 6 were extracted from SID and Magiran. Additionally, one study gained from snowball method. Almost, all of the studies were interventional. There were 597 participants in this systematic review.

Within the selected studies, there were some items investigated: 3 articles focus on diabetes-related psychical symptoms,[28,29] 3 articles focus on self-efficacy,[30] 2 articles focus on quality of life,[31-33] 1 articles focus on self-care.[34-36] 8 out of 9 articles showed a positive statistically significant correlation between Orem self-care model and positive outcomes in diabetic patients.

The details and main findings are given in Table 1. For instance, it was found that implementing Orem's self-care model can lead to a decreased level of diabetic neuropathy.[28] As well, the study showed that the group receiving Orem's model has more appropriate level of self-care.[29] Similarly, as previously mentioned, other factors such as quality of life[31-33] and self-efficacy[30] had improved in the group receiving Orem's self-care model.

An overview of quality assessment of studies using STROBE statement and CONSORT checklist and is presented in Tables 2. For the quality assessment of observational studies, the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) was used. STROBE consists of a checklist with 22 items. The total scores lower than 17 were indicative of low methodological quality. [37]. On the other hand, experimental and quasi-experimental studies were assessed by the CONSORT checklist. This checklist includes 25 items (38). Two authors were responsible for methodological quality of included studies. The third author resolved any disagreement between the reviewers. Seemingly, the included studies possessed acceptable quality.

Table 1. CONSORT and STROBE checklist scores of selected studies

Author and year of publication	Reference	Type of study	Score
Ahrary *et al.* (2020)	29	Randomized controlled trial	20/24*
Hemmati Maslakpak *et al.* (2017)	30	Controlled trial	21/24*
Mansouri *et al.* (2017)	31	Controlled trial	22/24*
Baraz *et al.* (2017)	32	Controlled trial	22/24*
Borji *et al.* (2017)	33	Controlled trial	21/24*
Shahbaz *et al.* (2016)	35	Controlled trial	20/24*
Ganjlo *et al.* (2015)	34	Randomized controlled trial	21/24*
Ghafourifard *et al.* (2015)	36	Controlled trial	22/24*
Khosravan *et al.* (2015)	37	Descriptive	20/22†

*: CONSORT score; †: STROBE score

Discussion

The results indicated Orem self-care model can lead to an improved level of self-efficacy, quality of life and self-care among the diabetic patients Also, the diabetic symptoms diminished. In this way, similar studies have showed that self-care behaviors can lead to the improvement of quality of life and reduction of costs.[39] It was proved that Orem self-care model is effective in changing the dietary habits among the participants,[35] as other studies have shown the efficacy of educational programs for improving the dietary behaviors and controlling the blood sugar are effective.[40] However, the seasonal preferences need to be taken into account. For instance, in autumn, the desire for protein and fat increases, whilst patients in summer prefer to consume more carbohydrate.[41] Even, religious beliefs, culture and lifestyle can affect dietary habits. In other words, dietary habits are individualized.[42] Even though, culture can alter the perception of patients regarding healthcare providers.[43]

Some of the included studies were conducted on patients with diabetic foot ulcer and showed promising results.[29,34] Other similar programs conducted in Iran were indicative of effectiveness of self-care training programs among diabetic patients as they could be helpful in wound healing process.[44] Similarly, studies in other countries highlighted the pivotal role of educating patients for the self-care.[45] It is proved that controlling the diabetic foot ulcer mainly depends on the patient.[46] However, the factors such as marital status, educational level, gender, age and occupation paly important role in the level of self-care.[47] For instance, it is claimed that rate of self-care is higher in females compared with males.[48] Likewise, single patients pay less attention to their self-care, especially regarding diabetic foot ulcer.[48] It is because stronger emotional and social bonds exist among married patients.[49]

The study participants were middle-aged and older adults. In this way, a study on older adults with diabetes showed health-related quality of life was moderate.[50] Though, married older adults had higher scores of quality of life.[51] Education was another multi-dimensional factor which can lead to higher contribution in the areas such economy, society and politics. Educational level directly affects the quality of life in the diabetic patients.[52] On the other hand, illiterate individuals are less familiar with coping strategies. Also, these individuals are in an inappropriate economic situation, which can cause more stressful situation and lower level of quality of life.[53]

The results indicated that Orem self-care model in female patients with diabetes suffering from neuropathy can be effective in reeducation of symptoms and severity and it led in improvement of knowledge, attitude and other related skills.[28,36] However, their performance and self-care abilities was reported moderate.[36] Other studies conducted in Iran have also shown that training can be effective in communication skills and self-control in patients with diabetic neuropathy.[54] In addition, a study in USA proved that education is effective in regulation of cognitive and emotional states.[55]

The psychological effect of self-care programs is also undeniable. For instance, a study showed that self-management were effective in improvement of mood condition in diabetic patients.[56] However, many programs do not consider education in the area of psychological skills, as problems such as depression are common in diabetic patients.[57] A study in Iran showed psychological training can alter the level of stress, anxiety and depression among diabetic patients.[58] Additionally, existential need in patients encourages them to seek meaning in life and this can help to increase their well-being.[59] In explaining the role of the spiritual dimension of patients, it can be acknowledged that patients who receive more services have more ability to deal with psychological pressure and psychological trauma.[60] For the success in implementing such programs, the imperative role of economy should not be neglected. Economic

well-being and availability of financial services can be effective in medical adherence of patients.[61] Naturally, unemployed individuals or those with a low-income profession are more vulnerable to experiencing adverse effects of the disorders.[62] Additionally, comorbidities play an important part in lack of self-care behaviors in diabetic patients.[63] Obstacles such as physical limitations, polypharmacy, adverse symptoms and lack of social and emotional support exist that can have negative impact on self-control and self-care behaviors.[64] However, it was claimed that increasing comorbidities result in poor diabetes self-care.[65]

One of the findings was focused on gestational diabetes, which indicated Orem self-care model can be effective for the patients.[30] Similarly, other studies also proved that self-care training can bring about positive outcome both in Iran and other countries.[66,67] However, one study claimed that education cannot alter the scores related to blood sugar.[68] Specially, after COVID-19 pandemic, the psychological problems have increased, which it may be reduced in gestational diabetes by self-care training.[66,69] Notably, lack of knowledge regarding health is a risk factor for poor self-management in women suffering from gestational diabetes.[70] Likewise, It is believed that lack of social support is another important risk factor for women and has adverse effects on gestational outcomes.[71] One of the important steps toward coping behaviors in gestational diabetes is acceptance. Emotional stability is a factor which may lead to the acceptance.[72]

In conclusion, looking at the relation found between Orem self-care model and diabetic patients' outcome, it can be stated the model can be effective for the diabetic patients. Positive and supportive implementation of the model can improve patients' quality of life, self-efficacy, and self-care behaviors and reduce diabetic symptoms. The studies analyzed in this review have revealed that Orem self-care has a significant association with positive outcomes among diabetic patients. This shows that Orem self-care model can induce transformational alterations in self-care and quality of life in diabetic patients. However, future studies need to focus on other outcomes related to diabetes as it is a multi-dimensional disease. Specially, psychological outcomes need to be considered.

Limitations. Despite the efforts to present a perfect systematic review, there were some shortcomings. In practice, the studies were included if were published in English or Persian owing to inclusion criteria. Also, the full text of one article was not available. Additionally, there were various tools for the measurement of outcomes. Although the search strategy was designed precisely and snowball search of included studies was considered, there may be some missing data. Absolutely, there is need for conducting more studies to complement the findings of current study.

Table 1. Overview of Included Studies

Author, Year, Ref.	Sample Size/ Gender	Study type	Partici-pants	Mean age	Measurement tool	Inter-ven-tion Period	Control	Outcome	Key points/ Main findings
Ahrary *et al*. (2020) [28]	*n*=120	RCT	Women with type 2 diabe-tes and diabetic periphe-ral neuro-pathy	54.62 ± 6.93	Diabetes Self-Care Activities and Diabetic Peripheral Neuropathy Self-Care, Michigan Neuropathy Screening Instrument, Toronto Cli-nical Scoring System, Peripheral Neuropathy Self-Care Requisites	Four weeks	Routine care program in the diabetes clinic	Symptoms and severity of diabetic neuropathy, fasting blood sugar and glycosylated hemoglobin	Decreased level of diabe-tic neuropathy symptoms and severity among participants (P=0.001), glycosylated hemoglobin (P=0.004), fas-ting blood sugar (P=0.001)
Hem-mati Mas-lakpak *et al.* (2017) [29]	*n*=50 F:27, M:23	Quasi-experi-mental	Patients with dia-betic foot ulcers (Either Type 1 diabetes or Type 2 diabetes)	54.13 ± 7.64	Self-care status, Saint Elian Wound Score System (SEWSS), Orem assessment form	12 weeks	Usual care	Ischemia, infection, edema, neuropathy, location, topographic aspects, number of affected zo-nes, depth, wound healing phase and self-care	Better scores for self-care, num-ber of affected zones, ischemia, infection and wound healing phase in the in-tervention group compared with the intervention (P<0.05)
Mansou-ri *et al.* (2017) [30]	*n*=42	Quasi-experi-mental	Women with ges-tational diabetes mellitus (n=42)	49	Diabetes Self-efficacy Scale (CIDS)	NR	N/A (pre and post type)	Self-efficacy	Higher level of self-efficacy in the intervention group (P=0.01) Better post-in-tervention score compared with the pre-interven-tion (P>0.001)

Table 1. Overview of Included Studies. (Cont.)

Author, Year, Ref.	Sample Size/ Gender	Study type	Partici-pants	Mean age	Measurement tool	Inter-ven-tion Period	Control	Outcome	Key points/ Main findings
Baraz *et al*. (2017) [31]	*n*=30 F:15, M:15	Quasi-experi-mental	Patients with Type 2 Diabe-tes	46.69 ± 7.56	Iranian Short Form Health Survey, Quality of Life Questionnaire	110 hours (two ses-sions)	N/A (pre and post type)	Quality of life	Improvement in some of the quality of life compo-nents such as General health (P = 0.027), Physical role (P < 0.001), Physical functioning (P = 0.027), Social functioning (P = 0.029) and Body pain (P = 0.020) No significant difference between the groups regarding emotional role, strength and vital energy, and general health perception
Borji *et al*. (2017) [32]	*n*=80 F:36, M:44	Quasi-experi-mental	Patients with Type 2 Diabe-tes	43.80 ± 11.93	The 36-Item Short Form Health Survey (SF-36), Orem assessment form	360 to 540 minu-tes (6 ses-sions)	No special care	Quality of Life	Significant improvement of quality of life af-ter intervention (P<0.001) No significant improvement in the control group (P>0.05)
Shahbaz *et al.* (2016) [34]	*n*=60 F:27, M:23	Quasi-experi-mental	Patients with dia-betic foot ulcer	54.57 ± 6.04	Orem assessment form	210-255 minu-tes (5 ses-sion)	NR	Self-care	Significant diffe-rence between the groups after intervention (P<0.001)

Table 1. Overview of Included Studies. (Cont.)

Author, Year, Ref.	Sample Size/ Gender	Study type	Partici-pants	Mean age	Measurement tool	Inter-ven-tion Period	Control	Outcome	Key points/ Main findings
Ganjloo *et al.* (2015) [33]	*n*=75 F:38, M:37	RCT	Patients with diabetes type 2	35-65	Audit of Diabetes Dependent Quality of Life (ADDQoL-19) and Self-care inventory (SCI)	4 wee-ks	Under the current educa-tion of diabetes center	Quality of Life	Improved level of quality of life score after eva-luation of social, psycho-spiritual and social dimensions (P>0/001) Significant difference in quality of life score between intervention and compa-rison group (P>0/001)
Ghafou-rifard *et al.* (2015) [35]	*n*=20 F:3, M:17	quasi-experi-mental	Hospi-talized diabetic patients	42.64 ± 20.15	Summary of Diabetes Self-care Activities (SDSCA)	NR	N/A (pre and post type)	Self-care	Improved level of score regarding diet (P=0.04), physical activity (P=0.000), blood sugar le-vels (P=0.003), medication the-rapy (P=0.001) and diabetic foot care (P=0.01) Improved level of self-care among inter-vention group participants (P>0/05)
Khos-ravan *et al.* (2015) [36]	*n*=120	Cross-sectio-nal	Women with diabetic periphe-ral neuro-pathy	53.50 ± 6.82	Michigan Neuropathy Screening Ins-trument and Toronto Clini-cal Neuro-pathy Score, Summary of Diabetes Self-care Activities (SDSCA), Toronto Cli-nical Scoring System	N/A	N/A	Self-care in re-lation with knowledge, attitude and performan-ce	Weak ability of self-care in the desired outco-mes after based on the Orem self-care model

RCT: Randomized controlled Trial; NR: Not reported; N/A: Not Applicable ; F: Female ; M:Male

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Development and Validation of the Companion's Satisfaction Questionnaire of Patient's Hospitalized in Intensive Care Units

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Development and Validation of the Companion's Satisfaction Questionnaire of Patient's Hospitalized in Intensive Care Units

Abstract

Objective. The current study aimed to develop and validate of companions' satisfaction questionnaire of patients hospitalized in ICUs. **Methods.** This is a methodological study that was performed in three phases: In the first phase, the concept of companion's satisfaction of patients hospitalized in ICUs was defined through qualitative content analysis method. In the second phase, early items of questionnaire were generated based on findings of the first phase. In the third and final phase, validation of the questionnaire was evaluated using face, content and construct validity as well as reliability. **Results.** In exploratory factor analysis, three subscales including: satisfaction with nursing staff communication (5 items), satisfaction with nursing care (12 items), and satisfaction with decision making (5 items) were extracted by Eigen

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value above one and factor load above 0.5. Internal consistency and stability of the developed questionnaire confirmed with 0.94 and 0.95 respectively that indicated acceptable reliability. **Conclusion.** The 22-item developed questionnaire is valid and reliable for measurement of levels of companion's satisfaction of Iranian patients hospitalized in ICUs.

Descriptors: validation study; personal satisfaction; surveys and questionnaires; nursing care; intensive care units.

Desarrollo y Validación del Cuestionario de Satisfacción del Acompañante de Pacientes Hospitalizados en Unidades de Cuidados Intensivos

Resumen

Objetivo. Desarrollar y validar un cuestionario de satisfacción de acompañantes de pacientes hospitalizados en UCIs. **Métodos.** Estudio de validación que se realizó en tres fases: en la primera se definió el concepto de satisfacción de los acompañantes de pacientes hospitalizados en UCI mediante el método de análisis de contenido cualitativo; en la segunda fase se generaron los primeros ítems del cuestionario a partir de los resultados de la primera fase; y en la tercera fase se evaluó la validación del cuestionario mediante la validez facial, de contenido y de constructo, así como la fiabilidad. **Resultados.** En el análisis factorial exploratorio, se extrajeron tres subescalas que incluían: satisfacción con la comunicación del personal de enfermería (5 ítems), satisfacción con los cuidados de enfermería (12 ítems) y satisfacción con la toma de decisiones (5 ítems) con un valor Eigen superior a uno y una carga factorial superior a 0.5. La consistencia interna y la estabilidad del cuestionario desarrollado se confirmaron con 0.94 y 0.95 respectivamente, lo que indicaba una fiabilidad aceptable. **Conclusión.** El cuestionario desarrollado de 22 ítems es válido y fiable para medir los niveles de satisfacción de los acompañantes de pacientes iraníes hospitalizados en UCI.

Descriptores: estudio de validación; satisfacción personal; encuestas y cuestionarios; atención de enfermería; unidades de cuidados intensivos.

Desenvolvimento e Validação do Questionário de Satisfação do Acompanhante para Pacientes Hospitalizados em Unidades de Terapia Intensiva

Resumo

Objetivo. Desenvolver e validar um questionário sobre a satisfação dos acompanhantes de pacientes hospitalizados em UTIs. **Métodos.** Estudo de validação realizado em três fases: na primeira fase, o conceito de satisfação de acompanhantes de pacientes internados em UTIs foi definido por meio do método de análise qualitativa de conteúdo; na segunda fase, os primeiros itens do questionário foram gerados a partir dos resultados da primeira fase; e na terceira fase, a validação do questionário foi avaliada por meio da validade de face, de conteúdo e de construto, bem como da confiabilidade. **Resultados.** Na análise fatorial exploratória, três subescalas foram extraídas, incluindo: satisfação com a comunicação da equipe de enfermagem (5 itens), satisfação com a assistência de enfermagem (12 itens) e satisfação com a tomada de decisões (5 itens) com um valor Eigen maior que um e uma carga fatorial maior que 0.5. A consistência interna e a estabilidade do questionário desenvolvido foram confirmadas com 0.94 e 0.95, respectivamente, indicando confiabilidade aceitável. **Conclusão.** O questionário de 22 itens desenvolvido é válido e confiável para medir os níveis de satisfação dos acompanhantes de pacientes iranianos hospitalizados em UTI.

Descritores: estudo de validação; satisfação pessoal; inquéritos e questionários; cuidados de enfermagem unidades de terapia intensiva.

Introduction

In recent years, quality of care has become an important matter in healthcare systems worldwide. Particularly, the quality of care as perceived by patients and their relatives is a current focus of interest.[1] Satisfaction with nursing cares is one of the indicators of quality of care in health centers in all countries. Therefore, people satisfaction has been concerned for health care and hospitals managers.[2,3] In deed the key to the success of any health center or hospital is to obtain satisfaction with nursing care and to improve patient's satisfaction.[4] Over the last three decades, investigations on health service delivery and patient satisfaction have increasingly played important roles as quality indicators to improve and evaluate the consequences of care provided by health care centers.[5] Hence, measuring satisfaction with nursing care is essential to assess the outcome of ongoing efforts to improve quality of care and ensure hospital progress.[6] In Iran, since 2011, the Ministry of Health and Medical Education, in line with its main mission, all hospitals have obliged to periodically assess patient satisfaction and interventions needed to increase patient satisfaction.[7]

Most often we have problem with measuring patients 'satisfaction in ICUs.[8] Many patients in ICUs are critically unwell, sedated, paralyzed, and unable to communicate. As such, the viewpoints of families and companion's become highly relevant.[5,9] Patients in ICUs even may not remember critical care experience completely, which is very important in investigating patients 'satisfaction.[10] Because most ICU patients cannot make decisions themselves, family members and companions are actively involved in the care process as surrogate decision-makers and are, hence, judges about quality of care. However, family and companions' satisfaction with care is complex and is not clearly defined.[11,12] Therefore, patient's companion's satisfaction can be measured as a substitute for patients 'satisfaction in these units. Patients' companion's is a part of taking care of the patients, as well as providing support for the patients' family and companions can affect patients' improvement.[13] Consequently, assessing family and companions needs and satisfaction with care and information/ decision making must be an integral part of quality assessment in the ICU.[14] Satisfaction is a balance of expectations and actual care delivered and heavily dependent on societal perception of adequate care.[15]

Measuring companion's satisfaction of the patients hospitalized in ICUs requires standard and context-based questionnaires. First reports of families' viewpoints date from the 1970s.[16] However, only recently have tools been validated— e.g., the CCFSS[17] and the FS-ICU[18,19] that systematically measure family satisfaction. This tools are being extensively used in other countries. But measuring the satisfaction of patients companions admitted to ICUs requires specific and context - based tools tailored to socio-cultural conditions that can provide accurate data about the quality of nursing care in that particular country.

The only study in this regard in Iran is a research conducted by Dolatyare *et al.*[20] On the translation and localization of the 34-item satisfaction questionnaire of family patients in ICUs Canadian version (FS-ICU 34) which after translating and performing face, content, and construct validity to 30 items has been reduced in three dimensions: satisfaction with medical staff performance (12 items), comfort (12 items) and decision making (6 items). In designing this questionnaire, the opinions and perspectives of patients' companions and families in Iran for generation of items and design of questionnaire were not taken into consideration and only the questionnaire designed in another country has been translated and localized. Because patient's companion's satisfaction can be influenced by several factors, and the acquired data must be accurate, good validation is obligatory for the adequate use of the questionnaires. Psychometric properties like validity and reliability, are essential components of questionnaires due to these describe the quality of the measurement. Questionnaires lacking acceptable validation may not measure the construct they intend to assess, or the values that arise from the questionnaire may not indicate the "true" value.[1,21] This may not only disrupt research but as well as misguide the health team working with the questionnaire. Therefore, the quality of a questionnaire is evaluated by its psychometric properties and rate of symmetry with social and cultural structure of target community.[1,22] Therefore, the aim of the present study was to develop a valid and reliable questionnaire that assesses level of satisfaction of patient's companions in ICUs (CS-ICU).

Methods

Study design and participants. This study was a methodological study that was performed in three phases. Data in this study were collected from April 2022 to July 2023 at the educational hospitals in Jahrom, Iran. Patient's companions included family members and relatives.

Phases of the study. This research was performed in three phases as follows (Figure 1):

The first phase. In this phase, the concept of patient's companion's satisfaction in ICUs was conceptualized and defined by the qualitative content analysis method. In this method, the codes and their categories were directly extracted from the interviews. In qualitative content analysis, the researcher interpreted the results using presenting data in Microsoft words and categories and dimensions which involved understanding, interpreting and conceptualizing of the underlying meanings of the qualitative data.[23] In this part, 25 patient's companions in ICUs participated in the research. The collection data were conducted through semi - structured and in- depth interviews. Inclusion criteria of patient's companions were (1) willingness to participate in the study, (2) ability to express experiences, (3) passing at least 48 hours of admission in ICU, (4) the presence of the patient's companions including close relatives and those who make decision for the patient including spouse, father, mother, sister, brother, friend, and his/ her children, (5) visiting the patient at least three times in ICU. Exclusion criteria of participants were (1) patient's companions younger than 18 years, (2) patient's companions with cognitive impairment and mental disabilities, and (3) lack of patient's companion's willingness to continue the study. Each interview lasted on average 40 - 60 min. A total interview was conducted in hospital in Jahrom based on their prior agreement and at the time they were comfortable. Interview with patient's companions continued to data saturation. Interviews were tape-recorded, transcribed verbatim in Microsoft words software, Ver2013 for manage the coding process. Then, analysis data were conducted using qualitative content analysis and Graneheim and Lundman approach.[24] In this stage, the primary codes were extracted and the subcategories and categories were formed. In the end of this part, the dimensions of patient's companion's satisfaction in ICUs were extracted and provided a final definition of the concept of patient's companion's satisfaction in ICUs.

***The second phase*.** In this part, the items pool of was formed for design a patient's companion's satisfaction questionnaire in ICUs according to the following stages: (i) Dimensions extracted from the first phase of the study for patient's companion's satisfaction in ICUs; (ii) Reviewing relevant texts and articles regarding patient's companion's satisfaction in ICUs, and (iii) Reviewing relevant questionnaires in the field of patient's companion's satisfaction in ICUs.

The third phase. In this phase, psychometric properties of developed questionnaire were evaluated. These properties included face, content, and construct validity, and reliability questionnaire. These properties were distributed the following:

a) Face validity: The face validity was conducted in the two qualitative and quantitative sections. The qualitative section was performed through interviews with 10 patient's companions in ICUs. The patient's companions about difficulty, suitability and ambiguous of the questionnaire items were asked and their recommendations on the items were applied. In the quantitative section, the impact score was calculated for the importance every item and remove inappropriate items. Thus, for every item within the questionnaire, a Likert scale with 5 - Likert points scale and scores of 1-5 was considered and rated. The range of options include: very important (score 5), important (score 4), standard importance (score 3), slightly important (score 2), and not important (score 1). Then, the developed questionnaire was completed by 10 patient's companions in ICUs. Impact score was achieved above 1.5 for all the items in this part.[25] The method used to calculate the Impact Score was: *Impact Score=Frequency (%)* × *Importance* (Importance= patient's companions who have checked options 4 and 5). [26]

b) Content validity: The content validity was conducted in the two qualitative and quantitative sections. In qualitative part, 12 experts were asked to assess the questionnaire about grammar, using appropriate words, placement of items in the appropriate place and right scoring.[27] In quantitative part, content validity ratio (CVR) and content validity index (CVI) were determined for every item of questionnaire. For evaluating the necessity of every items of the questionnaire, the CVR according to Lawshe[28] scale and modified table by Ayre and John Scally[29] was used. Based on the Lawshe scale the CVR was calculated on a three-point scale. Every item was scored according to three options on the graph (1=not necessary, 2=useful, but not essential, and 3=essential) by 10 experts. If the CVR score is higher than 0.80, the CVR of the scale has been approved.[26,28] The method used to calculate the CVR was:

$$CVR = \frac{NE - N/2}{N/2}$$

Where N= the total number of specialists and NE=the number of specialists who have checked option 3. In the CVI, the relevance of each item was analyzed by 10 experts on a four-point Likert scale (not relevant: 1; a little relevant: 2; somewhat relevant: 3; and extremely relevant: 4).[30] The acceptable and adequate amount for the CVI was equal to 0.79 and if the CVI for every item was calculated to be less than 0.79 it would be considered unacceptable and that item would be eliminated from the questionnaire.[31] If the CVI scores for every item was between 0.70–0.79 that item is questionable and challengeable and so requires further revision and modifications. [26,31] The method used to calculate the CVI was:

$$CVI = \frac{The\ Number\ of\ the\ specialists\ who\ have\ checked\ option\ 3\ and\ 4}{The\ total\ number\ of\ specialists}$$

c) Initial reliability: In this section, correlation coefficient between items and as well as between items and whole questionnaire were determined using the Cronbach's alpha and inter-item correlation coefficient (ICC) by 30 patient companions in ICUs.

d) Construct validity: in this part, exploratory factor analysis (EFA) was used to determine the construct validity of the CS-ICU scale. The EFA was used

to determine the interrelationship between items and to summarize related items in a dimension.[32] In the EFA from the principal component analysis (PCA) for factors extraction, Kaiser- Meyer- Olkin index (KMO) for determine sampling adequacy, Bartlett's Test for evaluation the correlation between the items of the questionnaire in order to integrate them and varimax rotation for simplify and interpret the factor structure using taking the Eigen value above one was used. In addition to, the scree plots as well as for determination the number of factors was used. The number of people required for carrying out factor analysis per every item between 3 - 10 samples.[33] Thus, in the present study, the CS-ICU scale was completed by 301 patient companions in ICUs using convenience sampling. The factor loading for every item in order to item maintenance above 0.5 was considered.

e) Final reliability: Reliability of the CS-ICU scale was calculated through two internal consistency and stability methods. For calculate the internal consistency, the CS-ICU scale was completed by 30 patient companions in ICUs and then Cronbach's alpha coefficient was determined. Alpha coefficient at least 0.7 was considered suitable for the reliability.[34] In order to evaluate the stability of the CS-ICU scale, the test-retest method was conducted. The CS-ICU scale was completed by 30 patient companions in ICUs at two time with on 2-week intervals. [35] Then, the correlation of scores between the two tests was calculated through ICC. The ICC above 0.8 represents the appropriate stability of the questionnaire.[36]

Statistical analysis. Statistical analyses were conducted using the SPSS version 21.0. Normality data with Kolmogorov-Smirnov test was confirmed. Descriptive analysis test, factor analysis, EFA, KMO, Bartlett's Test, Cronbach's alpha, ICC and Pearson test were used for data analysis in this research.

Ethics approval and consent to participate. The current study was approved by the ethics committee of Jahrom University of Medical Sciences in Iran with Number of Ethics IR. Jums. Rec.1397.105). the before the data collection, patient companions in ICUs signed an oral and written informed consent form. They as well as were ensured regarding the anonymity, confidentiality of the data, and voluntary participation in research.

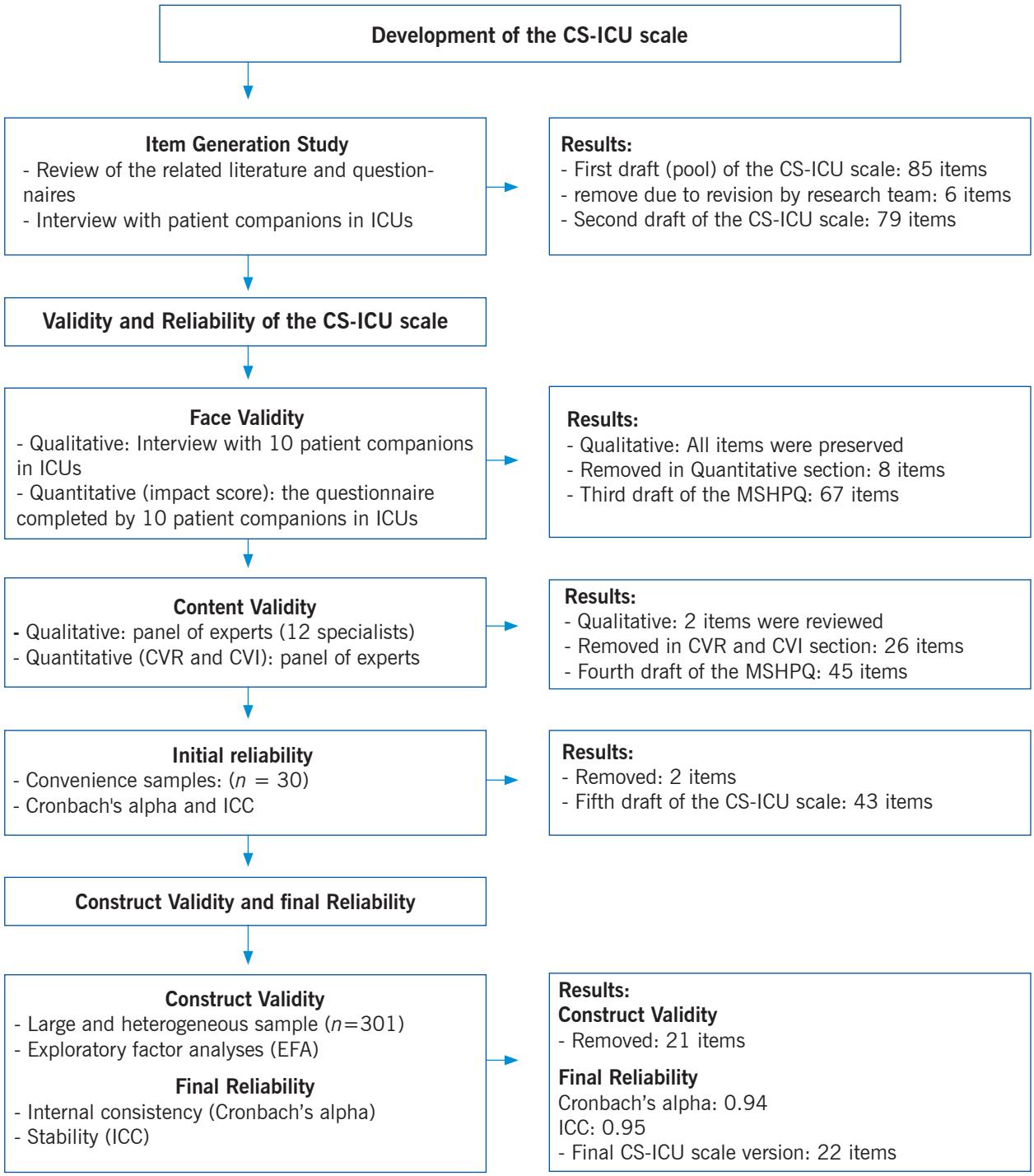

Figure 1. Flow diagram of the development and validation of the companion's satisfaction questionnaire of patients hospitalized in ICUs (CS-ICU scale)

Results

The results of the study are presented in three phases as follows.

The first phase

In this part, the concept of patient's companion's satisfaction in ICUs was defined based on the literature review and patient's companion's experiences using the qualitative content analysis. Patient's companion's satisfaction in ICUs is a complex and multidimensional concept which has different dimensions. The dimensions of patient's companion's satisfaction in ICUs included in four dimensions; satisfaction with nursing staff communication, satisfaction with nursing care, satisfaction with medical team personnel, and satisfaction with decision making.

The second phase

In this phase, the findings of the literature review and qualitative content analysis were merged in order to generate an items pool for the CS-ICU scale. The items pool consists of 85 items in four dimensions of satisfaction with nursing staff communication, satisfaction with nursing care, satisfaction with medical team personnel, and satisfaction with decision making. In the next step, the research team in three sessions reviewed the items of the CS-ICU scale for evaluate overlapping and duplicate items that finally six items were removed from the questionnaire and remained 79 items.

The third phase

a) Face validity. In the qualitative part of the face validity, the item was not deleted and only a few items were modified based on patient's companion's comments. In the qualitative part of the face validity, eight items were deleted due to an impact score less than 1.5. Thus, 71 items remained for the CS-ICU scale.

b) Content validity. In qualitative part of content validity, five items were modified according to specialist's panel comments. In CVR assessment, the 18 items were deleted due to the CVR score of lower than 0.80. In CVI assessment, eight items were removed because of the CVI score of less than 0.79. Thus, in the end this part, 45 items remained for the CS-ICU scale.

c) The initial reliability. the internal consistency CS-ICU scale with Cronbach's alpha was 0.93. The correlation between item number 12 "nurses provided the necessary information about the replacement of the wound dressing" with the whole CS-ICU scale was 0.01, and item number 23 "When with nurse a question is asked, they answer it" was – 0.02. Thus, the above two items deleted due to a correlation of lower than 0.3. Eventually, 43 items preserved for the CS-ICU scale.

d) Construct validity. in this section, the number of 301 patient's companions in ICUs from educational hospitals of Jahrom were completed the 43 - items CS-ICU scale in order to evaluation of EFA. The KMO value equals 0.943, which shows the appropriateness of the selected sample size in the supervision scale for the EFA. Furthermore, the Bartlett test of sphericity was significant in the level of $p = 0.001$. Hence, the data are appropriate for the factor analysis. The EFA with principal component analysis (PCA) and varimax rotation led to the extraction of three factors with Eigen value above one. Table 1 shows the Eigen value, percentage of variance for three factor and as well as factor loadings for the items that met maintenance criteria. The scree plot diagram also showed that 3 or 4 factors are sufficient to explain the concept of companion's satisfaction of patients hospitalized in ICUs from nursing services. Therefore, 21 items removed from the CS-ICU scale because of factor loading less than 0.5. Finally, 22 items and three factors remained for the CS-ICU scale. Three factors of the CS-ICU scale included the following: factor one "satisfaction with nursing staff communication"

Table 1. Results of a PCA of the 22 - items CS-ICU scale

subscales	Item	Factors		
		1	2	3
Satisfaction with nursing staff communication	The nurses had a good relationship with each other.	0.864		
	The nurses treated with patient's companions with respect.	0.764		
	The nurses treated with patients with respect.	0.753		
	The nurses established a good nonverbal communication with patients.	0.567		
	The nurses answered the questions and concerns of the patients' companions properly.	0.598		
Satisfaction with nursing care	The nurses checked patients' vital signs (blood pressure, temperature, pulse and respiration) and serum status in a timely manner.		0.754	
	The nurses carefully examined the patients' problems.		0.756	
	The nurses cared for patients as a member of their family.		0.711	
	The nurses were success in face with occurrence problems in patients.		0.621	
	The nurses followed up on diagnostic procedures of patients (ultrasound, tests, photographs, CT scans, etc.).		0.599	
	The nurses provided the necessary and complete explanations about patient care at home.		0.644	
	The explanations and educations of the nurses are simple and understandable for us.		0.711	
	The nurses provided the required information for the patients' companions honestly.		0.634	
	In patients care, there was good cooperation between of the treatment team members.		0.588	
	The nurses paid attention to the privacy and culture of the patients during care.		0.521	
	The nurses paid attention to patients' emotional needs (such as the meeting patients' needs) and responded appropriately.		0.577	
	The nurses responded to patients' religious-spiritual needs appropriately (such as the call to prayer).		0.579	
Satisfaction with decision making	The nurses were involved the patient's companions in the care process.			0.722
	The nurses were involved the patient's companions in decision-making processes for patients in times of need.			0.635
	The nurses informed the patient's companions of the decisions made for the patient if needed.			0.612
	The nurses agreed with the patient's companions about care and treatment methods of patients if needed.			0.533
	The nurses supported from patients' companions suggestions about patients care methods.			0.512
Eigen value		5.301	3.289	1.987
Percentage of variance		23.345	19.450	15.205

with 5 items, factor two "satisfaction with nursing care" with 12 items, and factor three "satisfaction with decision making" with 5 items. The three rotated factors explained 58% of the total variance. The items of the CS-ICU scale were rated on a five-point Likert response scale, 1 = very low, 2 = low, 3 = moderate, 4 = high and 5 = very high.

e) Final reliability. Cronbach's alpha of the 22-item CS-ICU scale was 0.94 that represents appropriate internal consistency. The ICC coefficient between test and retest reliability was 0.95 that indicated an optimal stability of the CS-ICU scale during the time. Also, Cronbach's alpha and ICC coefficient for three factors was calculated that are shown in Table 2.

Table 2. The Cronbach's alpha and ICC values for CS-ICU scale and its factors

Factors	Subscales	Number of items	Internal consistency	Stability
1	Satisfaction with nursing staff communication	5	$\alpha = 0.92$	ICC = 0.96
2	Satisfaction with nursing care	12	$\alpha = 0.92$	ICC = 0.91
3	Satisfaction with decision making	5	$\alpha = 0.89$	ICC = 0.94
Total	CS-ICU scale	22	$\alpha = 0.94$	ICC = 0.95

Discussion

The present study dealt with the development and validation of a scale for patient's companion's satisfaction in ICUs. Patient's family and companion's satisfaction is one of the important criteria in assessing quality of care in ICUs.[20,37] Measuring companion's satisfaction of the patients hospitalized in ICUs is significant since most of the ICUs patients can't make decision about their care; as well as assessing patient's companion's satisfaction can help the improvement procedure of services, cares and provided treatments.[38] The result showed that the CS-ICU scale was a reliable and valid questionnaire for the evaluation of patient's companion's satisfaction in ICUs.

There are several questionnaires to assess the patient's companion's satisfaction in ICUs. Only four instruments could be classified as being of "well-established quality": the CCFNI, the SCCMFNA, the CCFSS, and the FS-ICU. Nevertheless, these high-quality questionnaires consisted of 35 different versions, each with large disparities in psychometric properties.[1,3] However, these questionnaires have limitations. The limitations of the instruments include insufficient data regarding (1) construct and content validity (2) inter-rater reliability and (3), test-retest reliability (1). Due to construct validity is the extent to which a questionnaire actually measures what it claims to measure, and content validity refers to whether the tool includes the proper information, they both are of great importance, especially in a subjective outcome like satisfaction. Differences may arise because inherent semantic differences and socio-cultural differences. For example, the degree of companions and family participation in the decision-making process differs across the world.[39] Therefore, in order to accurately measure of satisfaction, a specific questionnaire be tailored to the socio-cultural and context – based conditions of the same community is required.

The developed and validated questionnaire of CS-ICU in this study had three domain including satisfaction with nursing staff communication, satisfaction with nursing care, and satisfaction

with decision making with 22 items. These three domains are central to overall companions and family satisfaction with ICU care. First, satisfaction with nursing care provides information on how families and patients companions experience general aspects of care. Second, patient's companion's satisfaction with decision making is an important element due to the family and companions is a substitute decision maker for their especially ill family member in a complex healthcare environment such as ICUs. Patient's companion's satisfaction is also related to the family being provided with clear data due to this enables them to actively participate in the decision-making process.[1,3,40] The FS-ICU scale with 34 – items were developed by Heyland and Tranmer[41] included two domains of satisfaction with care and satisfaction with decision making. Some items of the satisfaction with care and satisfaction with decision making domains in the FS-ICU scale are comparable with items of the CS-ICU scale with 22 – items in the present study. The items in the FS-ICU scale were derived from the existing literature on patient satisfaction and quality of care near the end of life. However, the items in the CS-ICU scale were derived from the existing literature on patient satisfaction and interview with companions of patients hospitalized in ICUs.

The CCFSS developed by Wasser *et al.*[42] is another questionnaire to measure family satisfaction with intensive care that included five domains of assurance, information, proximity, support, and comfort. The result of studies about CCFSS as well as shows first in five studies[42-46] reported adequate internal consistency, whereas four other studies[47-50] found it to be poor. Second, CCFSS had mediocre responsiveness and data on other psychometric data are lacking. Third, a questionnaire designed in a particular country only reflects the language and culture of the same community, in which case due to the content inconsistency it will cause many problems when used in another community.[51] The quality of a questionnaire is as well as highly dependent on the circumstances under which it is used. In addition to, it depends on what population it is used on. For example, differences in language, culture, and patient companion's population have a high effect on the appropriateness of a questionnaire.[1,51] Also, the SCCMFNA 14 – items scale developed by Johnson *et al.*[52] and CCFNI 45 – items scale developed by Molter [53] both measures need of family members which differs from the purpose of satisfaction measurement in the present study. In this regard, Heyland *et al*.[54] express that although satisfaction reflects the amount of fulfillment of needs and expectations, but meeting needs does not guarantee satisfaction.

Finally, in the evaluation of family and companions' satisfaction with intensive care, the use of valid and reliable questionnaires is essential to gain appropriate and high-quality data. Nevertheless, this is the first study in Iran that critically examined the psychometric properties of companion's satisfaction questionnaires of patients hospitalized in ICUs. This data is necessary as an outcome quality indicator and to better target improvement initiatives in the ICU. One of the strengths of present study is that the CS-ICU scale was developed the both inductive and deductive approach and as well as have been used psychometrics properties consist of face, content, and construct validity, internal consistency and test – retest reliability. Also, the CS-ICU scale is a short-form (22 items) questionnaire that can be responded by patient's companions in about 10 minutes, which is indicating the feasibility of using this questionnaire. The greatest strength of the present study was the development of a context-bound questionnaire to assess companion's satisfaction of patients hospitalized in ICUs. Besides the strengths of the described above, this study also holds limitations. First, we do not know the opinions and comments of non-participating families and companions. Another limitation of this study is that the questionnaire suffering of self-report scales.

Conclusion. In the present study, the three-dimension CS-ICU was developed as a short self-report scale for measurement of companion's

satisfaction of Iranian patients hospitalized in ICUs. The CS-ICU scale is a valid, reliable and context-based questionnaire which can be used in different levels in the healthcare centers such as education, research, care management, satisfaction assessment, and improving nursing services.

Availability of data and material. Data is not and will not be made available elsewhere. Further data set could be obtained on request if required through corresponding author with email: ali.dehghani2000@ gmail.com.

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Fatores associados à saúde e autonomia reprodutiva de mulheres quilombolas no Brasil

Original Article

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Factors associated with the health and reproductive autonomy of Quilombola women in Brazil

Abstract

Objective. To verify the association between reproductive autonomy and sociodemographic, sexual, and reproductive characteristics in Quilombola women (a term indicating the origin of politically organized concentrations of Afro-descendants who emancipated themselves from slavery). **Methods.** Cross-sectional and analytical study with 160 women from Quilombola communities in the southwest of Bahia, Brazil. Data were collected using the Reproductive Autonomy Scale and the questionnaire from the National Health Survey (adapted). **Results.** Out of the 160

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participating women, 91.9% declared themselves as black, one out of every three were aged ≤ 23 years, 53.8% were married or had a partner, 38.8% had studied for ≤ 4 years, over half (58.1%) were unemployed, only 32.4% had a monthly income > R$ 430 (80 US dollars), 52.5% had their first menstruation at the age of 12, 70.7% had not accessed family planning services in the last 12 months, and over half used some method to avoid pregnancy (59.0%). The women had a high level of reproductive autonomy, especially in the "Decision-making" and "Freedom from coercion" subscales with a score of 2.53 and 3.40, respectively. A significant association ($p<0.05$) was found between the "Total reproductive autonomy" score and marital status, indicating that single or unpartnered women had higher autonomy compared to married or partnered women. **Conclusion.** The association of social determinants of health such as marital status, education, and age impacts women's reproductive choices, implying risks for sexual and reproductive health. The intergenerational reproductive autonomy of Quilombola women is associated with sociodemographic and reproductive factors.

Descriptors: women; Quilombola communities; reproductive health; socioeconomic survey; personal autonomy; nursing.

Factores asociados a la salud y la autonomía reproductiva de las mujeres *quilombolas* en Brasil

Resumen

Objetivo. Verificar la asociación entre autonomía reproductiva y características sociodemográficas, sexuales y reproductivas en mujeres *quilombolas* (término que indica procedencia de concentraciones de afrodescendientes políticamente organizadas que se emanciparon de la esclavitud). **Métodos.** Estudio transversal y analítico con 160 mujeres de comunidades quilombolas del sudoeste de Bahía, Brasil. Los datos fueron recolectados utilizando la Escala de Autonomía Reproductiva y el cuestionario de la Encuesta Nacional de Salud (adaptado). **Resultados.** De las 160 mujeres participantes 91.9% se declararon negras, una de cada tres tenía edad ≤ 23 años, 53.8% estaban casada o tenían pareja, 38.8% había estudiado por ≤ 4 años, más de la mitad (58.1%) no trabajaba, solo 32.4% tenía renta > R$ 430 mensual (87 $US dólares), el 52.5% tuvo la primera menstruación a los 12 años, 70.7% no había acudido a servicios de planificación familiar en los últimos 12 meses y más de la mitad usaba algún método para evitar embarazo (59%). Las mujeres tuvieron un alto nivel de autonomía reproductiva, especialmente en las subescalas "Toma de decisiones" y "Ausencia de coerción" con una puntuación de 2.53 y 3.40, respectivamente. Se encontró asociación significativa ($p<0.05$) entre la puntuación de "Autonomía reproductiva total" con el estado civil, indicando el análisis que

las mujeres solteras o sin pareja tenían mayor autonomía en comparación con las casadas o con pareja. **Conclusión.** La asociación de determinantes sociales de la salud como el estado civil, la escolaridad y la edad interfieren en las opciones reproductivas de las mujeres, implicando riesgos para la salud sexual y reproductiva. La autonomía reproductiva intergeneracional de las mujeres quilombolas está asociada a factores sociodemográficos y reproductivos.

Descriptores: mujeres; quilombola; salud reproductiva; encuesta socioeconómica; autonomía personal; enfermería.

Fatores associados à saúde e autonomia reprodutiva de mulheres quilombolas no Brasil

Resumo

Objetivo. Verificar a associação entre a autonomia reprodutiva e características sociodemográficas, sexuais e reprodutivas em mulheres quilombolas (termo que indica a origem de concentrações politicamente organizadas de pessoas de ascendência africana que se emanciparam da escravatura). **Métodos.** Estudo transversal e analítico com 160 mulheres (80 mães e 80 filhas) de comunidades quilombolas no sudoeste baiano, no Brasil. Os dados foram construídos através da aplicação da Escala de Autonomia Reprodutiva e do questionário da Pesquisa Nacional de Saúde (adaptado). **Resultados.** das 160 mulheres participantes 91.9% se autodeclararam negra, a maioria com idade ≤ 23 anos (35.6%), 53.8% são casadas ou com companheiro, 38.8% com estudos ≤ 4 anos, mais da metade (58.1%) não trabalham, apenas 32.4% têm renda > R$ 430, a maioria teve a primeira menstruação até os 12 anos de idade (52.5%), não participou de grupo de planejamento familiar nos últimos 12 meses (70.7%), mais da metade utilizava método para evitar a gravidez (59%). Apresentaram elevada autonomia reprodutiva, com destaque para as subescalas "Tomada de decisão" e "Ausência de coerção" medindo 2.53 e 3.40, respectivamente. Encontrou-se associação significativa ($p<0.05$) entre o escore de "Autonomia reprodutiva total" e estado conjugal, com a análise indicando que mulheres solteiras ou sem companheiro apresentaram maior autonomia, comparadas às mulheres casadas ou com companheiro. **Conclusão.** A associação dos determinantes sociais de saúde como estado civil, menarca, escolaridade e idade interferem nas escolhas reprodutivas das mulheres, implicando em riscos à saúde sexual e reprodutiva. A autonomia reprodutiva intergeracional das mulheres quilombolas está associada a fatores sociodemográficos e reprodutivos.

Descritores: mulheres; quilombola; saúde reprodutiva; enquete socioeconômica; autonomia pessoal; enfermagem.

Introduction

The relationship a woman has with her sexual partner, the culture, and the context in which she lives influence her ability to achieve her reproductive intentions. Accordingly, the level of reproductive autonomy is shaped as these influences change, which can differ among women with multiple partners, women without partners, women living in a community with strong reproductive rights, and women living in a community where reproductive rights are not supported.[1] Autonomy is considered essential for decision-making in various healthcare situations, from seeking and using care to choosing treatment options. Women's ability to take care of their health and utilize healthcare services appropriately may partly depend on their autonomy to make decisions.[2]

Women's reproductive decisions may be impacted by factors such as marital status, age, sociodemographic conditions, color and race, religion, occupation, geographic region, and education.[3] Due to geographic distances, difficulty of access, lack of infrastructure in services, and scarcity of public policies, rural populations tend to be disadvantaged in healthcare.[4] Reproductive autonomy is essential for a woman as it facilitates her ability to choose childbirth, abortion, or contraception without undue influence from men, healthcare providers, the government, the international development community, or religious doctrine.[5] This autonomy may fluctuate within different relationships and cultural contexts, depending on the degree to which the partner or the surrounding community supports reproductive rights.[6] Sexual and reproductive health interfaces with various themes such as sexuality experience, human rights, cultural and religious aspects, gender relations, as well as access to healthcare services, which requires special attention from the healthcare sector, as they affect the health and well-being of individuals and communities.[7] Accordingly, Black Quilombola women are often deprived of their sexual and reproductive rights, resulting from difficulties in accessing healthcare services, low educational attainment, and few opportunities determined by their living conditions, in addition to geographical difficulties.

Contextualizing, historically, quilombos were characterized as places isolated both temporally and geographically, serving as hiding spots for enslaved people who had escaped. Individuals and even entire families who were kidnapped from their homeland, the African continent, were forced into various types of work, exploitation, and violence. Currently, Quilombola communities are present in almost the entire Brazilian territory and remain vibrant and active, contributing to the country's development through agriculture, cuisine, handicrafts, and various cultural expressions. They are social groups whose ethnic identity still distinguishes them from the rest of society, due to their organizational form, their relationship with other groups, and their political action.

To promote reproductive health for women and prevent the risk of unwanted pregnancy, the use of contraceptive methods is of paramount importance. Broader access to family planning, especially to contraceptive methods, can substantially reduce unwanted pregnancies and unsafe abortions.[8] A woman's ability to act according to her intention to use contraceptives may depend on the desires and actions of her partner or other members of her family or community.[6] The role of women as still being submissive regarding sexual matters and women's accountability regarding reproductive issues hinder dialogue with their partners and increase their vulnerability.[9] The cultural and religious backgrounds of a particular community have a powerful influence on health-seeking behavior.[8] We can better identify and understand the influence of interpersonal power on reproductive behaviors, which can inform strategies to prevent unwanted pregnancy.[6]

When compared to white women, Black women present a higher risk of illness and death. It is emphasized that socioeconomic inequalities and institutional racism contribute to the high vulnerability of Black women due to double discrimination, as they live in unequal gender and ethnic/racial conditions.[9] In this context, nursing is extremely relevant, considering that it plays an important role in Primary Health Care, through actions of disease prevention, health promotion, and health education. Therefore, this study allows the expansion of knowledge on the subject and provides support for nurses to rethink their professional practice, break with the fragmentation of care, and develop a qualified, respectful, and culturally oriented approach.[10]

Reproductive autonomy in Quilombola women is still a little-explored topic in the literature, justifying the present study, which aims to verify the association between reproductive autonomy and sociodemographic, sexual, and reproductive characteristics in Quilombola women.

Methods

This was a cross-sectional and analytical study conducted with 160 Quilombola women (80 mothers and 80 daughters), of reproductive age from 18 to 49 years of age, residing in 2020 in Quilombola communities in the municipality of Vitória da Conquista in the state of Bahia, from July 2019 to March 2020. This municipality is located in the center of the Southwest Bahia Identity Territory and has 23 certified Quilombolo remnant communities (CRQs) updated until Ordinance No. 118/2020, published in the Official Gazette of the Union (DOU) on July 20, 2020. However, this research was conducted in 9 Quilombola communities belonging to the municipality of Vitória da Conquista: Ribeirão do Paneleiro, Barrocas, Boqueirão, Sinzoca, Lagoa dos Patos, Laranjeiras, São Joaquim do Sertão, Lagoa Maria Clemência, and Lagoa de Melquíades.

This manuscript is an excerpt from the thesis entitled "Intergenerational reproductive autonomy in Quilombola women" presented to the Graduate Program in Nursing and Health linked to the Nursing School of the Federal University of Bahia. Due to the COVID-19 pandemic and logistical difficulties, it was not possible to conduct a population census involving all communities in this municipality. The impossibility of accessing the record of the number of families per Quilombola community also made it impossible to use a probabilistic sample. Therefore, it was decided to conduct the research in only nine communities, through a non-probabilistic convenience sample that included women who met the following inclusion criteria: Quilombola women of reproductive age from 18 to 49 years of age; mothers and daughters from a Quilombola community certified by the Palmares Cultural Foundation in the municipality of Vitória da Conquista, who authorized the visit for data collection and signed the consent form. Women (mothers and daughters) who did not reside in the community at the time, who had cognitive

or psychiatric disorders that could hinder the understanding of the data collection instrument, and those who, for any reason, did not complete the interview were excluded.

In order to provide greater territorial representativeness, the municipality was divided into Axes (Axis 1 - Central Quadrant; Axis 2 - North Quadrant; Axis 3 - Center-West Quadrant; and Axis 4 - South Quadrant). Then, the nine communities were randomly selected, obeying the proportionality by axis, resulting in the selection of the following communities: Ribeirão do Paneleiro, Barrocas, Boqueirão, Sinzoca, Lagoa dos Patos, Laranjeiras, São Joaquim do Sertão, Lagoa Maria Clemência, and Lagoa de Melquíades.

The data collection was carried out through the application of two instruments during visits to the women's (mothers and daughters) homes, accompanied by Quilombola leaders from their respective communities. The first instrument, the adapted National Health Survey (*Pesquisa Nacional de Saúde* - PNS) questionnaire, was used to cover, with independent variables, Module A (sociodemographic characteristics - age, marital status, level of education, self-declared color/race, religion, occupation); Module R (women's health - health, preventive exams, reproductive history, family planning, and contraception); and Module S (prenatal care and childbirth assistance).

The second instrument is the Reproductive Autonomy Scale, which aims to assess a woman's ability to achieve her reproductive intentions. The Brazilian version was translated from English to Portuguese and culturally adapted, proving suitable for evaluating the reproductive autonomy of Brazilian women and showing reliability in application among rural working women and rural Quilombola women, demonstrating acceptable internal consistency and reproducibility. The scale consists of 14 items in three subscales: "Decision-making," which evaluates who decides on using a method to avoid pregnancy, when to have a baby, and about an unplanned pregnancy; "Freedom from coercion," which addresses whether the partner prevented, hindered, or pressured the woman regarding using any contraceptive method to avoid pregnancy; and "Communication," related to the woman's comfort level in discussing her reproductive choices with her partner.

For data analysis, descriptive statistical procedures such as absolute and relative frequencies, means, medians, standard deviations (SD), interquartile ranges (IQR), and minimum and maximum values were used. Data normality was tested using the Shapiro-Wilk and Kolmogorov-Smirnov tests, while homoscedasticity was tested using Levene's test. Comparisons between two groups were performed using the Mann-Whitney test or Student's *t*-test for independent samples, whereas comparisons between three groups were made through the Kruskal-Wallis test (pairwise comparisons using the Mann-Whitney test) or one-way analysis of variance (ANOVA) (multiple comparisons using Tukey's test). The significance level adopted in the study was 5% ($\alpha = 0.05$), and all analyses were performed using the IBM SPSS version 21.0 software.

This research was guided by the ethical precepts governing Resolution No. 466/2012 of the National Health Council. Data collection began after approval by the Ethics and Research Committee of the Federal University of Bahia (UFBA), CAAE: 14087019.1.0000.5531, approval opinion No. 3.448.011, dated 07/10/2019.

The study adhered to all principles of bioethics such as non-maleficence, beneficence, autonomy, justice, and equity. Free choice to participate or not in the study was guaranteed, respecting the individuality and autonomy, the possibility of withdrawing or refusing to answer any questions, and providing the consent form for signature by all participants.

Results

The age of the 160 study participants ranged from 18 to 49 years (mean = 32.8; SD = 11.4). The main sociodemographic characteristics of the participants are presented in Table 1. Similar distribution was observed among age groups, marital status, years of education, and income. The majority of the sample consisted of Black women (91.9%), who did not have paid employment and were Catholic (85.6%). Most were aged ≤ 23 years (35.6%), 53.8% were married or in a relationship, 38.8% had ≤ 4 years of education, and over half (58.1%) were not employed, with only 32.4% having income > R$ 430, equivalent to US$ 80.22 at the time of the study.

Table 1. Distribution of the 160 study participants according to sociodemographic characteristics

Variable	*n*	%
Age group		
≤ 23 years	57	35.6
24 to 42 years	54	33.8
> 42 years	49	30.6
Ethnicity		
White	13	8.1
Black	147	91.9
Marital status		
Single or without partner	74	46.3
Married or with partner	86	53.8
Years of education		
≤ 4 years	62	38.8
5 to 9 years	49	30.6
> 9 years	49	30.6
Currently employed		
Yes	67	41.9
No	93	58.1
Monthly income		
≤ R$ 130 (U$ 24.2)	56	37.8
R$ 131 to R$ 430 (U$ 24.3 to U$ 80.2)	44	29.7
> R$ 430 (>U$ 80.2)	48	32.4
Religion		
Non-Catholic	23	14.4
Catholic	137	85.6

In Table 2, the distribution of participants according to their sexual and reproductive characteristics is presented. The majority of women experienced menarche by the age of 12 (52.5%), underwent cervical cytology screening in the previous two years (56.9%), never had a mammogram (83.0%), had sexual intercourse in the previous 12 months (87.5%), did not participate in a family planning group in the previous 12 months (70.7%), their partner did not participate in a family planning group (98.0%), used a method to prevent pregnancy (59.0%), had been pregnant at least once (80.6%), and had at least one childbirth.

Table 2. Distribution of study participants according to sexual and reproductive characteristics

Variable	*n*	%
Age group (*n*=158)		
≤ 23 years	83	52.5
24 to 42 years	37	23.4
> 42 years	38	24.1
Underwent cervical cytology screening in the last 2 years (*n*=160)	91	56.9
Underwent mammography screening (*n*=159)	132	83.0
Had sexual intercourse in the last 12 months (*n*=160)	140	87.5
Participated in a family planning group in the last 12 months (*n*=157)	46	29.3
Partner's participation in a family planning group (*n*=151)	3	2.0
Use of method to prevent pregnancy (*n*=156)	92	59.0
Has been pregnant (*n*=160)	129	80.6
Number of childbirths (*n*=160)		
None	31	19.4
1 to 2	63	39.4
> 2	66	41.2

The means, standard deviations, and minimum and maximum values of the reproductive autonomy scores are presented in Table 3. Overall, it is considered that the participants exhibited high reproductive autonomy, with the subscales that stood out with the highest proportional scores being "Decision-making" with a mean score of 2.53 (84.3% of the maximum score) and "Freedom from coercion" with a mean score of 3.40 (85.0% of the maximum score).

Table 3. Descriptive analysis of the reproductive autonomy scores of the 160 study participants, according to each subscale of the Reproductive Autonomy Scale

Subscale	Mean	Standard deviation	Minimum - Maximum
Decision-making	2.53	0.36	1.50 – 3.00
Freedom from coercion	3.40	0.57	1.60 – 4.00
Communication	3.10	0.60	1.80 – 4.00
Total	3.05	0.34	2.07 – 3.71

The association between the reproductive autonomy scores (subscales and total) and the sociodemographic characteristics of the sample is presented in Table 4. An association was found between the "total reproductive autonomy" score and marital status, meaning that single women or those without a partner exhibited higher autonomy (3.07) compared to married women or those with a partner (2.93). The scores of the three subscales (Decision-making, Freedom from coercion, and Communication) did not show an association with the sociodemographic characteristics studied.

Table 4. Association between the reproductive autonomy scores and the sociodemographic characteristics of the 160 study participants

Variable	Decision-making	Freedom from coercion	Communication	Total
Age group				
≤ 23 years	2.50 (IQR = 0.63)	3.40 (IQR = 1.00)	3.00 (IQR = 0.80)	3.07 (IQR = 0.43)
24 to 42 years	2.50 (IQR = 0.56)	3.60 (IQR = 1.00)	3.00 (IQR = 0.85)	3.07 (IQR = 0.50)
> 42 years	2.50 (IQR = 0.63)	3.20 (IQR = 0.80)	3.00 (IQR = 0.60)	2.93 (IQR = 0.43)
p-value	0.345	0.471	0.436	0.340
Ethnicity				
White	2.75 (IQR = 0.63)	3.00 (IQR = 1.10)	2.80 (IQR = 0.50)	2.93 (IQR = 0.54)
Black	2.50 (IQR = 0.50)	3.40 (IQR = 1.00)	3.00 (IQR = 0.86)	3.00 (IQR = 0.50)
p-value	0.284	0.310	0.174	0.330
Marital status				
Single or without partner	2.50 (IQR = 0.75)	3.60 (IQR = 1.00)	3.00 (IQR = 0.80)	**3.07 (IQR = 0.36)**
Married or with partner	2.50 (IQR = 0.50)	3.20 (IQR = 1.00)	3.00 (IQR = 0.85)	**2.93 (IQR = 0.57)**
p-value	0.174	0.250	0.417	0.040
Years of education				
≤ 4 years	2.50 (IQR = 0.56)	3.50 (IQR = 1.00)	3.00 (IQR = 1.00)	3.00 (IQR = 0.52)
5 to 9 years	2.50 (IQR = 0.50)	3.40 (IQR = 1.00)	3.00 (IQR = 0.90)	2.93 (IQR = 0.54)
> 9 years	2.50 (IQR = 0.75)	3.40 (IQR = 0.80)	3.20 (IQR = 0.70)	3.07 (IQR = 0.43)
p-value	0.846	0.578	0.085	0.217
Currently employed				
Yes	2.50 (IQR = 0.50)	3.60 (IQR = 1.00)	3.00 (IQR = 1.00)	3.07 (IQR = 0.50)
No	2.50 (IQR = 0.75)	3.40 (IQR = 1.00)	3.00 (IQR = 0.90)	3.00 (IQR = 0.50)
p-value	0.840	0,850	0.303	0.314
Monthly income				
≤ R$ 130 (U$ 24.2)	2.50 (IQR = 0.75)	3.40 (IQR = 1.00)	3.10 (IQR = 1.00)	3.09 (SD = 0.33)
R$ 131 to R$ 430 (U$ 24.4 to U$ 80.2)	2.50 (IQR = 0.75)	3.40 (IQR = 1.20)	3.00 (IQR = 0.95	2.95 (SD = 0.39)
> R$ 430 (U$ 80.2)	2.50 (IQR = 0.50)	3.30 (IQR = 0.75)	3.00 (IQR = 0.60)	3.04 (SD = 0.28)
p-value	0.705	0.319	0.317	0.134
Religion				
Non-Catholic	2.50 (IQR = 0.75)	3.40 (IQR = 1.00)	3.20 (IQR = 1.00)	3.00 (IQR = 0.50)
Catholic	2.50 (IQR = 0.50)	3.40 (IQR = 1.00)	3.00 (IQR = 0.80)	3.00 (IQR = 0.50)
p-value	0.454	0.915	0.720	0.936

Legend: IQR, interquartile range; SD, standard deviation. Values accompanied by IQR represent medians and were compared using the Kruskal-Wallis test (age group, years of education, and monthly income) or the Mann-Whitney test (ethnicity, marital status, currently employed, and religion); values accompanied by SD represent means and were compared using one-way ANOVA.

Associations between the reproductive autonomy scores and the sexual and reproductive characteristics of the sample were also investigated (Table 5). There was an association between the "Freedom from coercion" and "Total reproductive autonomy" scores with age at first menstruation and the performance of mammography screening. The analyses indicated that women who had late menarche (after 13 years) and who had undergone mammography screening demonstrated lower autonomy in the "Freedom from coercion" and "Total reproductive autonomy" subscales compared to their peers. The "Decision-making" and "Communication" scores were not associated with the sexual and reproductive characteristics evaluated.

Table 5. Association between the reproductive autonomy scores and the sexual and reproductive characteristics of the 160 study participants

Variable	Decision-making	Freedom from coercion	Communication	Total
Age at first menstruation				
≤ 12 years	2.50 (IQR = 0.75)	**3.60[a] (IQR = 1.00)**	3.00 (IQR = 1.00)	**3.08[a] (SD = 0.34)**
13 years	2.50 (IQR = 0.75)	**3.60[a] (IQR = 1.00)**	3.00 (IQR = 0.80)	**3.08[a] (SD = 0.32)**
> 13 years	2.50 (IQR = 0.50)	**3.00[b] (IQR = 0.60)**	3.00 (IQR = 0.65)	2.91[b] (SD = 0.34)
p-value	0.456	**0.020**	0.162	**0.029**
Underwent cervical cytology screening in the last 2 years				
Yes	2.50 (IQR = 0.50)	3.60 (IQR = 1.00)	3.00 (IQR = 1.00)	3.07 (SD = 0.36)
No	2.50 (IQR = 0.75)	3.40 (IQR = 0.80)	3.00 (IQR = 0.60)	3.01 (SD = 0.32)
p-value	0.376	0.419	0.195	0.311
Underwent mammography screening				
No	2.50 (IQR = 0.69)	**3.60 (IQR = 1.00)**	3.00 (IQR = 0.80)	**3.07 (IQR = 0.50)**
Yes	2.50 (IQR = 0.50)	**3.00 (IQR = 0.60)**	3.00 (IQR = 1.20)	**2.78 (IQR = 0.50)**
p-value	0.351	**0.009**	0.110	**0.002**
Had sexual intercourse in the last 12 months				
No	2.50 (IQR = 0.69)	3.20 (IQR = 0.80)	3.00 (IQR = 0.40)	3.00 (IQR = 0.32)
Yes	2.50 (IQR = 0.69)	3.50 (IQR = 1.00)	3.00 (IQR = 0.95)	3.00 (IQR = 0.57)
p-value	0.645	0.522	0.416	0.696
Participated in a family planning group in the last 12 months				
No	2.50 (IQR = 0.50)	3.60 (IQR = 1.00)	3.00 (IQR = 1.00)	3.07 (SD = 0.34)
Yes	2.50 (IQR = 0.50)	3.40 (IQR = 1.00)	3.00 (IQR = 0.65)	2.99 (SD = 0.36)
p-value	0.097	0.189	0.123	0.222

Table 5. Association between the reproductive autonomy scores and the sexual and reproductive characteristics of the 160 study participants

Variable	Decision-making	Freedom from coercion	Communication	Total
Partner's participation in a family planning group				
No	2.50 (IQR = 0.69)	3.40 (IQR = 1.00)	3.00 (IQR = 0.80)	3.00 (IQR = 0.55)
Yes	2.50 (IQR = —)	3.00 (IQR = —)	3.00 (IQR = —)	2.93 (IQR = —)
p-value	0.598	0.743	0.946	0.769
Use of method to prevent pregnancy				
No	2.50 (IQR = 0.50)	3.60 (IQR = 1.00)	3.00 (IQR = 0.80)	3.04 (SD =0.38)
Yes	2.50 (IQR = 0.75)	3.40 (IQR = 1.00)	3.00 (IQR =0.75)	3.05 (SD = 0.32)
p-value	0.285	0.735	0.956	0.957
Has been pregnant				
No	2.50 (IQR = 0.75)	3.40 (IQR = 1.00)	3.20 (IQR = 0.80)	3.11 (SD =0.29)
Yes	2.50 (IQR = 0.63)	3.60 (IQR = 1.00)	3.00 (IQR =0.60)	3.03 (SD =0.35)
p-value	0.366	0.951	0.071	0.277
Number of childbirths				
None	2.50 (IQR = 0.75)	3.40 (IQR = 1.00)	3.20 (IQR = 0.80)	3.00 (IQR =0.43)
1 to 2	2.50 (IQR = 0.50)	3.40 (IQR = 1.00)	3.00 (IQR =0.60)	3.00 (IQR =0.50)
> 2	2.50 (IQR = 0.75)	3.60 (IQR = 1.00)	3.00 (IQR =0.90)	3.00 (IQR = 0.57)
p-value	0.472	0.995	0.197	0.608

Legend: IQR, interquartile range; SD, standard deviation; —, IQR could not be calculated due to the small group size ($n < 4$). Values accompanied by IQR represent medians and were compared using the Kruskal-Wallis test (age at first menstruation and number of childbirths) or the Mann-Whitney test (underwent cervical cytology screening in the previous 2 years, underwent mammography screening, had sexual intercourse in the previous 12 months, participated in a family planning group in the previous 12 months, partner's participation in a family planning group, use of method to prevent pregnancy, and has been pregnant); values accompanied by SD represent means and were compared using one-way ANOVA (age at first menstruation) or Student's *t*-test for independent samples (underwent cervical cytology screening in the previous 2 years, participated in a family planning group in the previous 12 months, use of method to prevent pregnancy, and has been pregnant). [a.b] Different letters indicate significant differences between groups (Mann-Whitney test or Tukey's test).

Discussion

The subscale score for "Decision making" varied from 1.00 to 3.00, while for the subscales "Freedom from coercion" and "Communication," the score ranged from 1.00 to 4.00. The subscales that stood out with the highest proportional scores were "Decision making" and "Freedom from coercion." The score of 2.53 (84.33% of the maximum score) for "Decision Making" is closer to 3.00, which is the maximum score, just as "Freedom from coercion" with a score of 3.40 (85% of the maximum score) is closer to 4.00. However, in the "Communication" subscale, the score was 3.10 (77.55% of the maximum score), which is further from the maximum score of 4.00.

The results indicated that Quilombola women showed high reproductive autonomy in the "Decision Making" and "Freedom from coercion" subscales. However, when compared to the study conducted with American women, it was found that the subscales showing greater reproductive autonomy were "Freedom from coercion" and "Communication." These results demonstrate that sociodemographic characteristics and other factors are associated with different levels of reproductive autonomy for each subscale among women in both studies.[1] These findings partially align with a study conducted with American women; the Quilombola women in the study represent 91.9% of Black ethnicity and showed high reproductive autonomy in the "Decision Making" and "Freedom from coercion" subscales, whereas Black women in the American study were associated with lower levels of reproductive autonomy in the "Freedom from coercion" and "Communication" subscales. However, the Black women showed higher levels of reproductive autonomy in the decision-making subscale.

The marital status of Quilombola women in the study can be considered a determining sociodemographic factor in reproductive autonomy, as the women who were single or without a partner showed higher overall reproductive autonomy compared to those women who were married or with a partner. However, in the study with American women, being married was associated with higher levels of autonomy in the "Communication" subscale and lower levels of autonomy in the "Decision making" subscale.[1] The exercise of reproductive health rights has been recognized as one of the prerequisites for sustainable development in many developing countries. Therefore, women need to be able to make decisions about their own health and reproductive rights, especially during the reproductive period.[13]

Late menarche and undergoing mammography examination among the Quilombola women in the study were factors associated with lower reproductive autonomy in the "Freedom from coercion" and in the "Total reproductive autonomy" subscales. However, it should be emphasized that due to regional and social inequities in Brazil, mammography coverage is still lacking, thus highlighting the inequalities in access to mammographic screening services. Therefore, it is necessary to understand the economic and social vulnerabilities that affect access to breast cancer screening and to recognize the need for strengthening women's health policies, as well as health education initiatives.[14]

The use of healthcare services is another factor that can influence the participation of women in breast cancer control actions. Therefore, access to mammography, the main early detection examination, is not equal among Brazilian women.[15] In this context, several factors hinder the health of Quilombola communities, whether due to geographical isolation, low levels of education, limited access to healthcare services, patriarchy, or racial and gender inequalities.

The health situation is not limited to the health-disease dichotomy but encompasses various aspects of life, especially the social condition of individuals. Female vulnerability and difficulty in accessing more remote areas such as rural zones are factors that contribute to the ineffective coverage of the female population by policies for comprehensive women's health care.[16] Thus, given the pronounced interference between racial relations and vulnerability to care, education, health information, and, primarily, the distance of vulnerable communities from the reach of comprehensiveness and equity, there is a need to promote practical health promotion strategies linked to these Quilombola populations and to integrate, especially, the Nursing team, as it is the category that is most in contact with the population within healthcare services and is responsible for the direct care of women at all stages of their life cycle.[17]

The ways in which racial relations are shaped make the Black population more vulnerable and

tend to hinder their access to healthcare services. Accordingly, it is necessary to observe the health of Black women from an ethnic-racial perspective and to understand that racism can be considered a social determinant and can directly intervene in the health-disease process.[18] Therefore, it is necessary to understand the reality of the health of these communities to provide support for adequate and effective planning of sexual and reproductive health actions, allowing these women to achieve their reproductive intentions.

Conclusion

The results of this study reinforce that freedom in deciding reproductive choices promotes safe and satisfactory sexual life. In this sense, reproductive autonomy is positively associated with decision-making about healthcare. It should be highlighted that improvement in access to sexual and reproductive rights can ensure women's reproductive well-being and strengthen decision-making about their own health. Geographical isolation, the COVID-19 pandemic, and the scarcity of previous studies were the main limitations of this study but were not impediments to conducting the research.

Differences in sexual and reproductive patterns reflect cultural influences, socioeconomic factors, and access to healthcare services. The association of social determinants of health such as marital status, menarche, education, and age interferes with women's reproductive choices, implying risks to sexual and reproductive health. The Quilombola women in this study showed high reproductive autonomy, especially in the Decision-Making and Freedom from coercion subscales. It was found that marital status interfered with reproductive autonomy, as single or unpartnered Quilombola women showed higher overall reproductive autonomy compared to married or partnered women. Late menarche and undergoing mammography examination were factors associated with lower reproductive autonomy in the "Freedom from coercion" and "Total reproductive autonomy" subscales.

Black and mixed-race women are subject to greater vulnerability, so it is important and necessary to identify racial biases in order to seek equity in caring for these women, allowing for differentiated assistance to this population. To improve health conditions, profound changes in economic patterns are necessary, as well as intensifying social and healthcare public policies. In the field of Nursing, research like this enables the expansion of knowledge about sexual and reproductive rights and how they are experienced in a specific population, breaking the fragmentation of care offered and providing qualified, humanized practice that respects the specificities of Quilombola women, thereby contributing to effective reproductive planning and reducing the number of unwanted pregnancies, complications resulting from the pregnancy and postpartum period, illegal abortions, and maternal and infant mortality.

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Qualitative nursing research: evidence of scientific validation from a translational perspective

Reflection Article

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Qualitative nursing research: evidence of scientific validation from a translational perspective

This article aims to reflect on scientific validation strategies in qualitative research in the light of translational theory in nursing. It is a reflection based on translational theory applied to nursing in strategies for validating qualitative studies. From this angle, validation is recognized as an adaptable construct, capable of eliciting/favoring an understanding of the subjectivity of the target audience in its relationship with the object of interest/study/research. The potential for advancing the science-profession lies in the interdisciplinary confluence of validation mechanisms, qualitative studies, the translational perspective, and nursing research. This confluence has the capacity to extend beyond theoretical and epistemological aspects. However, it is crucial to emphasize its profound, expressive, and relevant impact on the construction of scientific evidence. This impact aims to enhance the rigor and reliability of

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qualitative research, thereby bolstering its credibility and applicability in clinical practice.

Descriptors: qualitative research; validation study; nursing theory; nursing.

Investigación cualitativa en enfermería: pruebas de validación científica desde una perspectiva traslacional

Resumen

El objetivo de este artículo es reflexionar sobre las estrategias de validación científica en la investigación cualitativa a la luz de la teoría traslacional en enfermería. Se trata de una reflexión basada en la teoría traslacional aplicada a la enfermería y en las estrategias de validación de los estudios cualitativos. Desde este ángulo, la validación se reconoce como un constructo adaptable, capaz de favorecer la comprensión de la subjetividad del público objetivo en su relación con el objeto de investigación. Esta confluencia interdisciplinar entre los mecanismos de validación, los estudios cualitativos, la perspectiva traslacional y la investigación en enfermería tiene el potencial de contribuir al avance de la ciencia-profesión con un alcance más allá de los aspectos teóricos y epistemológicos, pero desde la perspectiva de un impacto profundo, expresivo y relevante en la construcción de la evidencia científica con aún mayor rigor y fiabilidad en la investigación cualitativa y, por tanto, a su credibilidad y aplicabilidad en la práctica clínica.

Descriptores: investigación cualitativa; estudio de validación; teoría de enfermería; enfermería.

Pesquisa qualitativa em enfermagem: evidências de validação científica sob a perspectiva translacional

Resumo

O artigo tem por objetivo refletir sobre as estratégias de validação científica em pesquisas de abordagem qualitativa à luz da teoria translacional em enfermagem. Trata-se de uma reflexão que tem como fundamento a teoria translacional aplicada à enfermagem em estratégias de validação de estudos qualitativos. Por esse ângulo, a validação é reconhecida como um constructo adaptável, capaz de suscitar/favorecer a compreensão da subjetividade do público-alvo na sua relação com o objeto de interesse/estudo/pesquisa. Esta confluência interdisciplinar entre os mecanismos de validação, os estudos qualitativos, as o/a prisma-ótica-olhar-concepção translacional e a pesquisa de enfermagem tem o potencial de contribuir para o avanço da ciência-profissão com alcance para além dos aspectos teóricos e epistemológicos, mas na perspectiva de impacto profundo-expressivo-relevante na construção de evidências científicas com ainda mais rigor e confiabilidade em pesquisas qualitativas e, por tanto, para sua credibilidade e aplicabilidade na prática clínica.

Descritores: pesquisa qualitativa; estudo de validação; teoria de enfermagem; enfermagem.

Translation concerns the incorporation of research results into the professional clinical practice, emerging as a "translation" of new knowledge, mechanisms, and techniques from scientific production, providing possibilities for care, management, and administration of health activities.[1,2] In the field of nursing, this social commitment began in the mid-2000s,[3] assumed as a challenge in building a praxis consistent with scientific advances in the area. The concept of validity, in turn, is linked to the very notion of scientific knowledge; however, in the nursing field, it carries different connotations. Its multiple interfaces include its applicability in qualitative research, where the interpretation of validation goes beyond the literal sense of the word, making it closer to the translation of knowledge.[4] In qualitative studies, validity is considered an adaptable construct capable of facilitating a more reliable approach to the subjectivity of the target audience and enabling the understanding of individual and collective experiences at various levels of depth.[4,5]

Validity in qualitative research can occur in a preliminary (research formulation), internal (research development), and external (research results) manner.[4] Therefore, the implicit need for the application of the validity framework is presumed when indicating, through translation, the researcher's implication and their influence on the research scenario as an essential aspect in qualifying the study and safeguarding the dissemination of knowledge as evidence applicable to problem resolution.[6] Although translational theory can apply to qualitative research, it is crucial to emphasize that other theoretical frameworks also support critical thinking and methodological foundation in the field to underpin the validity of this approach. Accordingly, positivist and interpretative thoughts are delineated. For the former, validity would be an objective attribute, subject to repetition, experimentation, and generalization. Regarding the interpretative conception, the concept facilitates the understanding of the phenomenon, description, and researcher-participant interaction (transactional validity) or the impact of the research on the individual (transformational validity).[7] Therefore, it approaches the research participant, bringing forth the applicability of knowledge constructed in the context of attention and care practices.

More specifically, qualitative nursing research can be observed from the perspective of historical and conceptual paradigms based on its construction. The perceived view of science, also called the interpretative paradigm, became incorporated into the field during the 1960s, under the aegis of the post-modernism movement, "due to examining phenomena in context, phenomenology, and other perceived views of philosophy leading to the discovery and development of nursing's inherent knowledge".[8] It is understood how this type of research influenced sociopolitical and educational issues in care, as well as the bases, concepts, and foundations of nursing beyond its practice.[9]

The adoption of the triangulation technique is acknowledged among the processes and procedures employed by researchers. This technique serves as an alternative for exposing researchers to different strategies in order to formulate a viable validation protocol. This can refer to data collection (divergent sources), researchers (consensus), theories (various scientific knowledge), environmental factors (different locations), and methodological approaches (mixed methods).[4,10] Within the domain of nursing science, various methods and techniques are integrated, including documentary and bibliographic research, observational surveys, focus groups, individual and in-depth interviews. Additionally, the collection of expert opinions from diverse perspectives related to the study object is incorporated. These methodologies collectively contribute to the construction of specialized care spaces.[11] These operationalization models are interconnected with the translation of knowledge and align with strategies such as Integrated Knowledge Translation, focusing on collaborative approaches through collective work with knowledge consumers (patients, managers, and healthcare providers). Hence, relational dialogue is encouraged, resorting to knowledge-to-action and maximizing its applicability.[2]

Considering the qualitative research approaches and, especially, the validation methods used in nursing, the creation of a conceptual model illustrating consolidated strategies in the field of study, with subsequent contextualization of the method, is deemed important, as depicted in Figure 1.

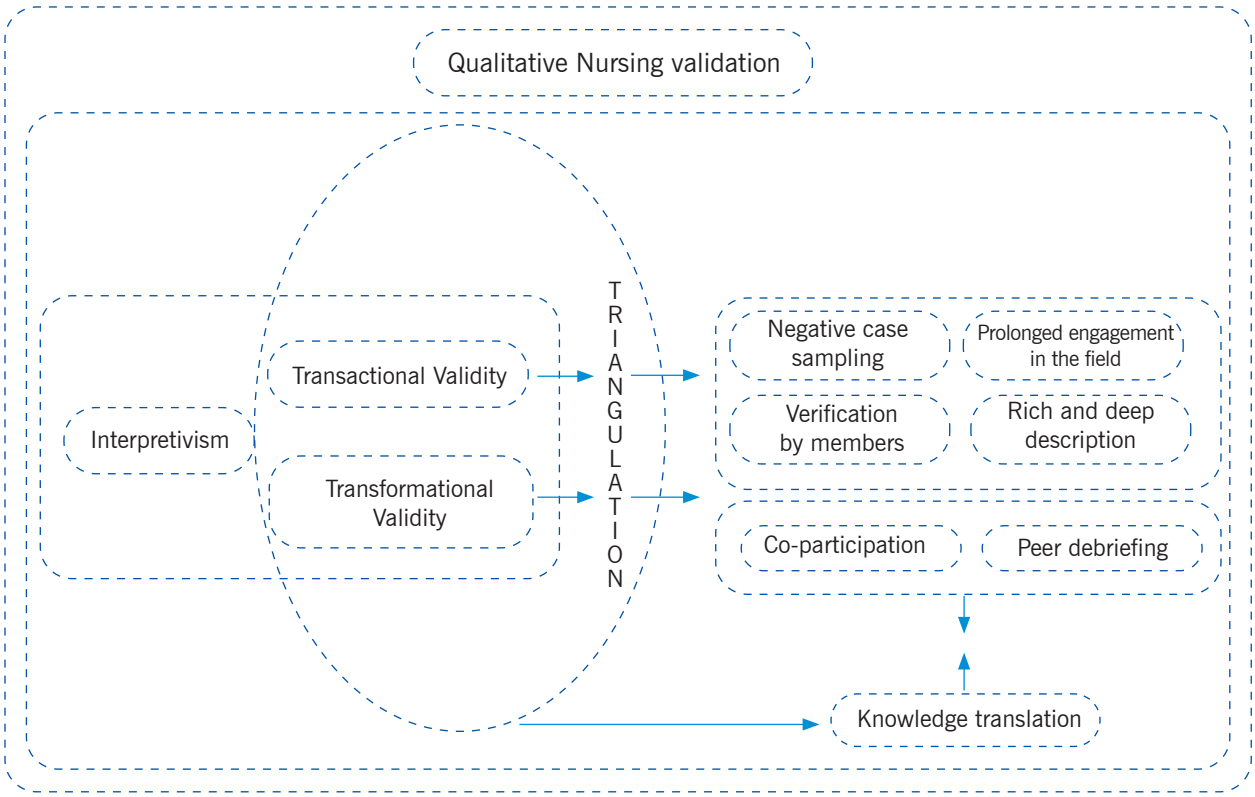

Figure 1. Theoretical-conceptual model for qualitative nursing research validation. Redenção, CE, Brazil, 2022.

Source: developed by the authors.

In the field of nursing, knowledge translation still poses a challenge to the care domain, especially due to the need for the theoretical application of practical constructs in the science of caring. To address this, one must identify the problem and its communication locus among users, develop and select a type of research, analyze its context, and devise ways to apply the solution through activities and interventions.[12,13] Some alternatives for such investments include negative case sampling, verification by members, prolonged engagement in the field, case studies, and peer debriefing, which will be addressed in this reflection. The negative case sampling validation strategy is employed in cases where an alternative interpretation is sought, sometimes distinct from what was expected from the research participants. For instance, when women refrain from reporting their aggressors even in situations of violence, a circumstance where reporting would be anticipated.[14] This type of knowledge provides the basis for constructing safe nursing care.[12]

In the verification by members technique, validation is performed by cross-checking participants' responses and returning the transcript of what was collected/recorded to them.[15] Through this strategy, knowledge translation in research can be actualized, as what is feasible for the study is validated by its members or external evaluators, thereby integrating practices in health/nursing.[6] Prolonged involvement in the setting and co-participation of individuals sharpen the sensitivity of the nursing researcher regarding the research locus, reducing discrepancies between the participant's needs and the researcher's thoughts or propositions.[16] This validation method can be recognized in the realm of health practices to foster surveillance and innovation in knowledge translation.[17]

The case study is also considered a validation strategy due to its rich and deep description of the situation experienced. Through it, a sequence of client identification can be followed, bringing the clinical closer to the practical and proposing facilitated interventions. In its steps, internal, external, and construct validation can be achieved, providing the production of a narrative of the behaviors adopted.[18] An example of applying the case study method is understanding how nursing care affects the user's ability to regain autonomy, examining the entire care plan and its effectiveness in the individual's rehabilitation or deterioration.[19] This type of validation is a way to apply knowledge translation as praxis by actualizing the clinical-care experience to the fidelity of the meticulous relationship of its variables.

Finally, the peer debriefing procedure is highlighted as an alternative used in the nursing field in realistic simulations. It involves validation by a third-party evaluator of the content shared by the study participants in the debriefing. This acts as a moderator of what was actually applied, instructing students and enhancing their gains.[20] This process is part of/is linked to an advanced proposal for knowledge translation associated with a conception for problem resolution in a strategic, enlightening, and deliberative manner.[21] Therefore, through knowledge of the validation of studies in qualitative research, the need to deepen the theme and research with this approach, emphasizing the application (translation) of knowledge, is emphasized. In this way, the variables relevant to the singularities of each user will be observed in-depth, with the capacity to exceed the strictly scientific and abstract the subjectivity of that which is not merely scientific but rather the lived experience of a social subject.

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Construction and validation of an Entrepreneurship Measurement Instrument for nursing students

Original Article

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Construction and validation of an Entrepreneurship Measurement Instrument for nursing students

Abstract

Objective. To develop a valid and reliable scale to measure entrepreneurship competences of nursing students, by assessing the level of development of diverse entrepreneurship dimensions. **Methods.** An Entrepreneurship Measurement Instrument, Catalonia (IME.Cat) was constructed, by adapting two existing instruments, and a psychometric study was performed to address the validity of the content and the construct, and the reliability. The internal consistency and the discrimination capacity of the instrument's items were examined. **Results.** The IME.Cat scale showed a high reliability (α=0.89) for the complete set of items. The Cronbach's α value of the individual dimensions were: Problem management=0.78; Creativity=0.76; Personal confidence =0.64; and Risk acceptance =0.46. The corrected homogeneity indices for each of the item in

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the instrument were high (>0.40). The Confirmatory Factorial Analysis validated the proposed structure of the items according to dimension. **Conclusion.** The IME. Cat scale showed solid psychometric values for assessing the entrepreneurship competences of nursing students within its dimensions, which are fundamental for the professional development of nursing.

Descriptors: entrepreneurship; validation study; psychometrics; competency-based education; students; nursing.

Construcción y validación de un Instrumento de Medición Emprendedora para estudiantes de enfermería

Resumen

Objetivo. Desarrollar una escala válida y fiable para medir competencias emprendedoras para estudiantes de enfermería, evaluando el nivel de desarrollo en diversas dimensiones del emprendimiento. **Métodos**. Se construyó el Instrumento de Medición Emprendedora Cataluña (IME.Cat) adaptando dos instrumentos existentes y se llevó a cabo un estudio psicométrico que abordó la validez de contenido, de constructo y la fiabilidad. Se examinaron la consistencia interna y la capacidad de discriminación de los ítems del instrumento. **Resultados.** La escala IME.Cat mostró una alta fiabilidad (α=0.89) para el conjunto completo de 25 ítems. Los valores del α de Cronbach de las dimensiones individuales fueron: Manejo de problemas=0.78; Creatividad=0.76; Seguridad personal=0.64; y Aceptación del riesgo=0.46. Los índices de homogeneidad corregidos para cada ítem del instrumento fueron elevados (>0.40). El Análisis Factorial Confirmatorio validó la estructura propuesta de ítems por dimensión. **Conclusión**. La escala IME.Cat mostró valores psicométricos sólidos para evaluar competencias emprendedoras en estudiantes de enfermería en

sus dimensiones, las cuales son fundamentales en el desarrollo profesional de la enfermería.

Descriptores: emprendimiento; estudio de validación; psicometría; educación basada en competencia; estudiantes de enfermería.

Construção e validação de Instrumento de Medição Empreendedora para estudantes de enfermagem

Resumo

Objetivo. Desenvolver uma escala válida e confiável para medir as competências empreendedoras dos alunos de enfermagem, avaliando o nível de desenvolvimento em várias dimensões do empreendedorismo. **Métodos.** O Instrumento de Medição de Empreendedorismo da Catalunha (IME.Cat) foi construído com a adaptação de dois instrumentos existentes, e um estudo psicométrico foi realizado para abordar a validade de conteúdo, a validade de construção e a confiabilidade. A consistência interna e a capacidade discriminatória dos itens do instrumento foram examinadas. **Resultados.** A escala IME.cat apresentou alta confiabilidade (α=0.89) para o conjunto completo de 25 itens. Os valores de α de Cronbach para as dimensões individuais foram: Tratamento de problemas=0.78; Criatividade=0.76; Segurança pessoal=0.64; e Aceitação de riscos=0.46. Os índices de homogeneidade corrigidos para cada item do instrumento foram altos (>0.40). A análise fatorial confirmatória validou a estrutura de itens proposta por dimensão. **Conclusões.** A escala IME.Cat apresentou bons valores psicométricos para avaliar as competências empreendedoras dos estudantes de enfermagem em suas dimensões, que são fundamentais para o desenvolvimento profissional da enfermagem.

Descritores: empreendedorismo; estudo de validação; psicometria; ensino baseado em competências; ensino baseado em competências; estudantes de enfermagem.

Introduction

In the last few years, a transformation has been observed towards new social customs. These social changes affect many health professions, such as nursing, with many internal changes observed in the nursing profession and the structures of health systems.[1] The subject of entrepreneurship in nursing has been gaining importance in the last few years, and experts in the area of nursing regard entrepreneurship as a way to innovate and improve patient care, and to create business and employment opportunities for nursing. In general, the entrepreneurial character can be defined as the realization or introduction of something new and different, as opposed to what is traditionally done, based on the identification of opportunities and necessities.

Currently, nursing study plans tend to focus on the clinical and care aspects, and do not tend to integrate entrepreneurship training, despite the belief that the phenomenon of entrepreneurship must be addressed from the area of education.[2] It has been observed that some countries already include this training. For example, Brazil, at the Federal University of Santa Catarina, teaches entrepreneurship in the initial training of nurses in an optional class in the second semester, named "Labor Market in Nursing and new modalities of service provision". The methodology utilized idea workshops and collective discussions that arose after the visits to private social businesses in Florianópolis.[3]

At the university of Massachusetts (UMass), a proposal has been made for a comprehensive certification program of nursing innovation and entrepreneurship (INNOVAR), designed for remodeling bachelor's education, by adopting a new vision of innovation in nursing and entrepreneurship education.[4] In the remaining countries consulted, such as Canada, Australia, and the United Kingdom, entrepreneurship was relevant in the practice of professionals, and efforts were made towards professional planning. In Canada, in 1930, 60% of the nurses exerted their profession as entrepreneurs.[5] The Royal College of Nursing Australia[6] and the Nurses Association of New Brunswick[7] delve into the characteristics of these professionals, exploring their activities, promoting good practices, and having an effect on training about leadership and the assumption of new roles in nursing. However, it was not observed that entrepreneurship is considered in their initial training for the development of projects related with the care of people's lives and health. The entrepreneurship training is provided as continuous education.

In agreement with Camarillo *et al*.,[8] nursing professionals lack academic training that allows them to see that after finishing university, they could establish businesses for caring for people's health, by performing healthcare functions to promote health, prevent disease, or interventions to comply with a specific healing and/or rehabilitation treatment. The university study programs that offer nurse training do not include courses that let the future graduates

visualize caring for health as an attractive option. In order for nurses to play a leading role in health innovation in the initial training of nurses, they must strategically think about the knowledge and skills that the next generation of nurses will need, and the support these needs.[9] One of the key elements is to develop talent, the ability to adapt to fast and constant changes, to identify opportunities in the area of health, to become a fundamental element in the generation of ideas, and the creation of new products and services.

Entrepreneurship education must be fostered to make all of these ingredients a reality.[10] Entrepreneurship is a competence that encompasses a set of abilities and skills that are demanded in personal, professional, and social areas,[11] such as: (i) Nursing management and leadership: developing the entrepreneurship initiative and spirit (ESIM) and the creative and entrepreneurship capacities (capacity to formulate, design, and manage projects/ capacity to seek and integrate new knowledge and attitudes); (ii) Innovation and entrepreneurship in nursing: demonstrate entrepreneurial initiative, motivation, and spirit with respect to self-learning and the professional activity (iii) Leadership in nursing: develop entrepreneurial initiative and spirit to create innovative and competitive proposals in the area of discipline; and: (iv) Management and innovation of nursing care: develop entrepreneurial initiative and spirit.

Catalonia offers some innovative experiences in the university training of nurses. Thus, the Escuela Universitaria de Enfermeria Gimbernat (EUEG) of Barcelona offers the mention of Leadership, Innovation, and Emerging Roles in Nursing, where the students can enroll in the course Innovation and Entrepreneurship in Nursing, for a total of 8 ECTS (European Credit Transfer System). The aim of this course is to: i) Promote learning competences linked to creativity, innovation, and entrepreneurship. ii) Receive expanded learning within the nursing discipline, that is, at the same time, different from the current theoretical contents found in the nursing degree, which are exclusively based on health care and assistance.

This training seeks to focus on personal and professional characteristics, such as Independence, innovation, and responsibility, and to drive innovation in health care. In summary, the intention is for students to understand the process of introduction and management of change to determine and play an active role as an agent of change, starting with this initial training.[12] Within the framework of this training, the question was raised whether there could be an entrepreneurship measurement scale to be used in nursing training, and to help with the analysis of the changes observed during the training, and the impact on the professional practice of the graduate after receiving training on Innovation and Entrepreneurship. The objective of the study was to develop a valid and reliable scale to measure entrepreneurship competences, by assessing the level of development of diverse entrepreneurship dimensions. This scale will allow us to better understand the usefulness and applicability of the entrepreneurship competences acquired in the training, and their transfer to the area of healthcare where they exert their profession.

Methods

To answer the objective of the study, an instrument was created starting with the Measurement Instrument of Entrepreneurship Attributes (IMAE).[12] Some of the sub-competencies of this instrument were posteriorly adapted, resulting in the Questionnaire of Competences in University Entrepreneurship (CCEU).[13] The first instrument by Alcaraz,[12] contained 99 items and measured factors that the author considered as key factors, which included 6 competences for entrepreneurship: risk tolerance, recover and learn from mistakes, identify opportunities, propose innovative solutions, obtain resources, and implement innovative solutions.

The second instrument, CCEU, is an instrument adapted from diverse validated questionnaires, and within it, different attributes are chosen that identify entrepreneurship competences in university students. It is composed of 25 items where the most notable features of the entrepreneur profile are considered, and where sub-competencies from each of them are chosen, with a series of entrepreneurship attributes that are compiled in 4 groups: Identify opportunities, develop solutions, learn from failure, and awareness of entrepreneurship. This instrument brings the possibility that the students become aware of their areas of opportunity in the sub-competences assessed. Starting with both instruments, the new instrument was constructed, taking into account the following aspects: (i) Identify equivalencies between the dimensions in both instruments of reference, and combine them into the new proposal; (ii) Identify the items corresponding to each dimension in the reference instruments as equivalent, eliminating those that are more redundant, to construct the proposal in a more reduced manner; (iii) Study the items that better fit with the Catalonian reality, as the resulting instrument would later be translated to Catalan to be applied in this context; (iv) Include those items that specifically express the Catalonian reality; and (v) Verify that all the dimensions and items fit within the objectives defined in the study. A traceability table was created.

At the end of the adaptation process of the IMAE and CCEU, the Entrepreneurship Measurement Instrument Catalonia (IME.Cat) was obtained. This instrument is composed of 24 items with a Likert scale format with 4 response options: "Definitely doesn't describe me" = 1; "Probably doesn't describe me" = 2; "It probably does describe me" = 3 and, "It definitely does describe me" = 4. It is organized around 4 dimensions: (1) *Problem management*: ability to identify discrepancies between an actual state and desired one, and posteriorly, act to resolve the discrepancy, with 9 items; (2) *Risk Acceptance:* willingness to face risks in search of better results, with 3 items; (3) *Creativity*: thinking ability to generate new, original, and valuable responses, with 8 items; and (4) *Personal confidence* (Self-confidence and Perseverance), with 5 items.

After the construction of the scale, it was subjected to content validity through experts' judgement. Eight experts were selected independently according to the following criteria: experience on the subject, diversity of perspectives, ability to provide constructive feedback, independence, and objectivity, informed consent to participate in the process, and availability. Following these criteria, two different groups composed of 4 participants from the sample, and 4 experts selected due to their experience in the area of nurse entrepreneurship were created. The experts had to assess the criteria of univocity, suitability, and relevance, as shown in Table 1.

Table 1. Validation criteria

Criteria	Definition	Score	
Univocity	If the item has only one meaning or is only use with a single and unique meaning	Si	1
		No	0
Suitability	If the questions are considered adequate according to the information that the instrument intends to collect	Si	1
		No	0
Relevance	The item is appropriate for representing the content of the construct of the variable under study	Si	1
		No	0

The critical value from which the items were analyzed was 80%, reformulating the items that did not reach this value.

The reliability of the scale and its parts was analyzed. To ensure the quality criteria demanded from assessment instruments, the content and construct validity and the reliability were analyzed, by studying the internal consistency and discrimination capacity of the items of the IME. Cat instrument. The reliability of set of items was analyzed by calculating the Cronbach's "alpha" reliability coefficient, which addresses this property of the instrument from a perspective of internal consistency. This coefficient was calculated with a 95% confidence, for the complete scale and for each of the 4 dimensions. For the analysis of the structural validity of the items, a Confirmatory Factor Analysis (CFA) was performed, to verify if the structure proposed, with the previously-known four dimensions, was replicated in our study, at least in an acceptable manner.

Sample. The scale was applied to a sample of 230 participants, who were selected randomly, by convenience, and who had previously signed an informed consent, which underlined the voluntary participation in the study and indicated that the personal data would be protected and treated with absolute confidentiality in accordance to the current laws on the treatment and protection of data. Thus, the sample was composed of nursing students and graduates who were enrolled or had taken the Nursing Innovation and Entrepreneurship course, within the training framework of the Escuela Universitaria de Enfermería Gimbernat-Barcelona (EUEG). The significant characteristics of the sample indicated a clear majority of women as compared to men (83.5% vs 16.5%). Their age ranged from 21 to 46 years old, with a mean of 25 and a standard deviation of ±5.0 years. The distribution showed a clear tendency towards younger participants, and also indicating that the mean age of women was somewhat lower than the mean age of the men (24.8 vs 28.0 years old).

Ethical considerations of the study. The study followed the following ethical principles: (i) Informed consent from the participants before gathering any data, as well as their voluntary declaration to participate; (ii) Minimization of data, only collecting the minimum amount of data necessary to meet the research objectives. Personal and sensitive data were not collected, only the basic data that provided sociodemographic information; (iii) Anonymization and pseudonymization of the data with codes, so that the data could not be directly linked; (iv) Safety of the data and storage for a pre-determined amount of time; (v) Transparency: the participants were provided information about the objective of the study, the protection of data, the possibility of correcting the incorrect data, or remove their consent at any point in time; and (vi) Compliance with the data protection laws and any ethical regulations related with research. Work was not performed with sensitive data, and for this reason, it was accepted by the Doctoral School of the University of Lleida.

Results

Validation through judges

The judges pointed to the need to make adjustments to items 16, 18, 22, and 23. They were re-written, and a linguistic correction was performed of the items, according to their indications. The final result was the IME.Cat, composed of 25 items framed within 4 Dimensions: Problem management, Risk acceptance, Creativity, and Personal confidence.

Reliability

The results showed that the reliability of the entire set of 25 items was high (0.89), which guarantees the trustworthiness of the answers provided by the sample of participants. Next, a reliability study was performed according to the dimensions. The results showed that the reliability was good in three of the four dimensions (0.64; 0.76 and

0 .78). The coefficient was poor (0.43) only in the dimension Risk acceptance, which could be associated to the low number of items in this dimension (3). Thus, the number of items in this dimension may have to be increased to improve its reliability. The results from the reliability analysis of the instrument according to the dimensions are summarized in Table 2 according the different dimensions:

Table 2. Reliability analysis

Dimensions	Number of items	Cronbach's Alpha	95% CI
Problem management	9	0.78	0.70 a 0.84
Risk acceptance	3	0.43	0.12 a 0.65
Creativity	8	0.76	0.67 a 0.83
Personal confidence	5	0.64	0.50 a 0.75
Complete questionnaire	25	0.89	0.86 a 0.92

The corrected homogeneity indices (CHI) of each of the items of the instrument are shown in Table 3. As shown, most obtained high values (>0.40), which strongly contribute to the reliability of the whole instrument. However, an exception was found in an item that was somewhat weaker, item 4, whose CHI was found at the threshold (0.20), which indicates that it should be eliminated from the questionnaire. In fact, its elimination would notably improve the reliability of the dimension to which it belongs (Risk acceptance, the one with the worse reliability), from 0.43 to 0.54, although its effect on the reliability of the whole instrument is minimal (from 0.89 to 0.90). This low effect resulted in the maintenance of item 4, because, for the research study, it meant obtaining data of interest on the participant's ability to assume risks.

The results obtained allow us to accept that the reliability of the measurement instrument is sufficiently guaranteed. Item 4 was not eliminated, as it would not greatly affect the whole instrument, and given the objective of the study, it was believed that it was a good example to better understand risk assumption.

Table 3. Reliability according to item and correlation coefficients item-dimension of the Entrepreneurship Measurement Instrument Catalonia (IME.Cat) (*n*=230)

Dimension and items	Reliability				item-dimension correlation
	Dimension		Questionnaire		
	CHI	REI	CHI	REI	
Problem management (0.78)					
Item 2: I am sometimes wrong and I make mistakes, but I know I can do things right	0.35	0.77	0.36	0.89	0.47
Item 5: When I want something, I insist until I get it	0.55	0.74	0.60	0.89	0.72
Item: I consider myself a resourceful person, especially when difficult situations arise	0.54	0.75	0.62	0.89	0.70

Table 3. Reliability according to item and correlation coefficients item-dimension of the Entrepreneurship Measurement Instrument Catalonia (IME.Cat) (*n*=230). (Cont.)

Dimension and items	Reliability				item-dimension correlation
	Dimension		Questionnaire		
	CHI	REI	CHI	REI	
Item: I often find quick and effective solutions to problems.	0.60	0.74	0.63	0.89	0.75
Item 21: When I think about starting a business, I'm not afraid of the idea of the unknown	0.50	0.75	0.53	0.89	0.64
Item 24: I don't get discouraged if I encounter obstacles to achieving my goals	0.41	0.77	0.43	0.89	0.56
Item 25: Even if I don't achieve my goals, I don't lose interest in what I do	0.56	0.74	0.58	0.89	0.68
Risk acceptance (0.43)					
Item 4: When I invest my money I prefer to risk it on something that can give me more profits than on a fixed-term deposit	0.20	0.54	0.23	0.90	0.40
Item 6: I can solve problems quickly, even under pressure	0.30	0.31	0.52	0.89	0.74
Item 15: I am confident in my own ideas and possibilities	0.37	0.19	0.63	0.89	0.79
Creativity (0.76)					
Item 1: I often have original ideas and put them into practice.	0.44	0.73	0.40	0.89	0.61
Item 7: I see creative possibilities (of innovation) in everything I do	0.52	0.72	0.47	0.89	0.70
Item 11: I enjoy looking for new ways of seeing things, instead of being guided by already known ideas	0.59	0.71	0.58	0.89	0.74
Item 12: I find risk exhilarating	0.36	0.75	0.43	0.89	0.48
Item 14: I believe in the saying: He who does not risk does not gain	0.28	0.76	0.35	0.89	0.40
Item 19: I am good at facing a large number of problems at the same time	0.54	0.71	0.56	0.89	0.70
Item 22: I feel safe even when someone criticizes what I have done	0.47	0.73	0.59	0.89	0.61
Item 23: When I face a problem, I like to find new ways to solve it	0.43	0.74	0.44	0.89	0.60
Personal confidence (0.64)					
Item 3: When I want something, I insist until I get it	0.41	0.58	0.46	0.89	0.66
Item 8: I firmly believe that I will be successful in everything I set out to do	0.53	0.51	0.50	0.89	0.76
Item 9: I firmly believe that if I don't succeed the first time, I should try again and again	0.41	0.58	0.46	0.89	0.66
Item 13: I am convinced of my capabilities and I know very well how to exploit them	0.38	0.60	0.48	0.89	0.62
Item 20: I believe that perseverance (consistency) is important to achieve success	0.26	0.64	0.28	0.89	0.48

CHI = Corrected item reliability; REI. = Reliability excluding the item

Validity of the instrument

The sample size was very low (only $n=230$) for the mathematical requirements of a CFA, so that the fit indices that assess the suitability of the use of this procedure with our data provided results that indicated a lack of fit (RMSEA>0.08). However, it contains the values of the correlation coefficients item-dimension and dimension-dimension. These coefficients allow us to admit that each of the items belongs to its expected dimension, as well as the correlations between dimensions. Thus, according to the data shown in Table 3, a good correlation can be observed between all the dimensions, especially between Problem management and Personal confidence (0.60), aside from Risk acceptance with Personal confidence (0.62). The lowest values were those that related the dimension Creativity with the dimensions Problem management (0.33) and Personal confidence (0.40); nevertheless, as a function of all these data, the structure proposed is deemed sufficiently proven.

Table 3. Correlation coefficients between the IME.Cat dimensions

Dimensions	PM	RA	C	PC
Problem Management (PM)	1.00	0.55	0.33	0.60
Risk acceptance (RA)		1.00	0.50	0.62
Creativity (C)			1.00	0.40
Personal Confidence (PC)				1.00

Discussion

The results from the present study demonstrate that the IME.Cat scale is a good tool for measuring the inherent skills in the entrepreneurship competence, and more specifically, those that shape the different dimensions of the IME. Cat: Problem management, Risk acceptance, Creativity, and Personal confidence (Self-confidence and Perseverance). It is important to have a scale of these characteristics, as the entrepreneurial culture gives confidence to people when promoting new ideas that allow students to create, execute, and perform any project they may want to pursue, hence the importance of the entrepreneurship course in personal and professional development.[13] Entrepreneurs must be aware of new opportunities.[14] Some of the personal characteristics form a synergy, such as the knowledge acquired, personal skills, experience, emotional intelligence, and the values that identify the abilities of a person to become an entrepreneur.[15]

In the modern context, entrepreneurship in Nursing is important for widening the visibility and consolidation of the profession as a science, a technology, and an innovation, in the most diverse scenarios and fields of action. Only then will society become aware of the advances in the profession, through its social mission, and its achievements in health. Addressing the concept of entrepreneurship, then, guides the promotion of visibility of nursing, as well as the achievements of new levels of professional development for nurses. [16]

It is important to train nursing professionals in entrepreneurial competencies, and the IME. Cat scale tool will allow making a diagnosis before the training intervention, performing an analysis of the progress achieved and the consolidation of the skills that were worked on. Education in entrepreneurial competencies will help us understand nursing in the 21st Century, as Leray, Villarruel and Ritchmond[17] proposed, with respect to strategic thinking, knowledge, and the skills that will be needed by the next generation of nursing professionals. Among the systematic competences found in the Tuning project,[18] we highlight the ability to adapt to new situations, the ability to create new ideas, creativity, leadership, the design and management of projects, entrepreneurship initiative and spirit, and the motivation of achievement.

Although this instrument was applied and validated with a sample composed of nursing

students, it would be equally applicable to any area of training, as it proposes items and dimensions that define entrepreneurship, and the IME.Cat emerged from other previous versions with generic characteristics. However, in this case, the focus was to deal with training challenges of nursing healthcare personnel, in which a fundamental task is to provide meaning to entrepreneurship, by developing competences in that field.[19] Therefore, the IME.Cat scale is a valid and decisive instrument in the challenge of professional development of nurses. The results obtained in the dimension Risk acceptance, and more specifically, in item 4, the Confirmatory Factor Analysis and the reliability analysis made us believe that more items should be added to this dimension, before deciding to eliminate item 4. This section is important in the training of nurses, as it is an essential skill that not only contributes towards their professional development, but also promotes the ability to continuously adapt, innovate, and improve healthcare. It is a key element for preparing future nurses to be able to face the dynamic and changing challenges in the area of patient care.[20]

In conclusion, the study highlights the efficiency of the IME.Cat scale as a valuable tool for measuring the values inherent to the entrepreneurial competency, especially in key dimensions such as Problem management, Risk acceptance, Creativity, and Personal confidence. Entrepreneurship in nursing in presented as essential in the modern context, to broaden the visibility and to consolidate the profession in diverse scenarios. Training in entrepreneurial competencies is supported by the IME.Cat scale, which is positioned as a tool that can be used to diagnose and analyze the progress in the development of entrepreneurial competences in nursing professionals. Without a doubt, the entrepreneurial competency allows nurses to create value when recognizing and taking advantage of opportunities, making decisions with limited information, and staying adaptable and resilient against conditions that are frequently uncertain and complex.

Limitations of the study. We believe that the IME.Cat scale is valid and reliable. However, the present study has two weaknesses: firstly, the dimension Risk acceptance would benefit from an improvement in its reliability by increasing the number of items that define it. In second place, this scale was applied to students in a specific center, and this could bias the results obtained. It would be interesting to broaden the sample to other contexts. Nevertheless, this does not invalidate the results obtained.

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The Effect of an Educational Intervention Based on the Health Action Process Approach on Nurses' Communication Skills

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The Effect of an Educational Intervention Based on the Health Action Process Approach on Nurses' Communication Skills

Abstract

Objective. This study aimed to the effects of the Health Action Process Approach (HAPA) in promoting the quality of nurses' communication skills among nurses. **Methods.** The present quasi-experimental research was conducted on 148 nurses (76 in the intervention and 72 in the control group) in Yazd province (Iran). In this study, the total number of nurses in one hospital was selected as the intervention group, while the nurses from another hospital were chosen as the control group. The participants were recruited from public hospitals in Ardakan and Meibod cities. The data collection instrument was a questionnaire based on the Health Action Process Approach (HAPA) Constructs and a communicative skill questionnaire. The data were collected from the two groups before, one month after, and four months after the intervention.

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The control group did not receive any educational training during the course of the study. **Results.** In the pretest, no statistically significant difference was found between the intervention and control groups regarding the behavioral stages of effective communication with patients. In the posttest, the mean task self-efficacy score was significantly increased in the intervention group compared to the control ($p<0.001$). The mean coping self-efficacy score was also significantly higher in the intervention group than the control in the posttest ($p<0.001$). Moreover, the mean coping planning score was significantly increased in the post-test intervention group($p<0.001$). The mean communicative skill score was also significantly increased in the intervention group compared to the post-test control ($p=0.03$). **Conclusion.** The intervention used in the present study based on the target model (HAPA) significantly affected nurses' self-efficacy and communicative skills in the experimental group.

Descriptors: self-efficacy; nurse; health action process approach; communication; education intervention.

Efecto de una intervención educativa basada en el enfoque del proceso de acción en salud sobre las habilidades comunicativas de las enfermeras

Resumen

Objetivo. Evaluar el efecto del enfoque del proceso de acción sanitaria (Health Action Process Approach (HAPA), en inglés) en la promoción de la calidad de las habilidades de comunicación de las enfermeras. **Métodos.** La presente investigación cuasiexperimental se llevó a cabo con 148 enfermeras (76 en el grupo de intervención y 72 en el de control) de la provincia de Yazd (Irán). Los participantes fueron reclutados en los hospitales públicos de las ciudades de Ardakan y Meibod. El instrumento de recogida de datos fue un cuestionario basado en los constructos HAPA y un cuestionario de habilidades comunicativas. Se recogieron datos de los dos grupos antes, un mes después y cuatro meses después de la intervención. El grupo de control no recibió ninguna formación educativa durante el estudio. **Resultados.** En la preprueba, no se encontraron diferencias estadísticamente significativas entre los grupos de intervención y de control en cuanto a las etapas conductuales de la comunicación eficaz con los pacientes. En la prueba posterior, la puntuación media de autoeficacia en la tarea aumentó significativamente en el grupo de intervención en comparación con el grupo de control ($p<0.001$). La puntuación media de autoeficacia en el afrontamiento también fue significativamente mayor en el grupo de intervención que en el grupo de control en el postest ($p<0.001$). Además, la puntuación media en planificación del afrontamiento aumentó significativamente en el grupo de intervención después de la prueba ($p<0.001$). La puntuación media

en habilidades comunicativas también aumentó significativamente en el grupo de intervención en comparación con el grupo de control después de la prueba ($p=0.03$). **Conclusión.** La intervención utilizada en el presente estudio basada en el modelo HAPA mejoró significativamente la autoeficacia y las habilidades comunicativas de las enfermeras del grupo experimental.

Descriptores: autoeficacia; enfermera; enfoque del proceso de acción sanitaria; comunicación; intervención educativa.

Efeito de uma intervenção educativa baseada na abordagem do processo de ação em saúde nas habilidades de comunicação do enfermeiro. Estudo quase experimental com grupo controle

Resumo

Objetivo. Avaliar o efeito da Abordagem do Processo de Ação em Saúde (HAPA) na promoção da qualidade das habilidades de comunicação dos enfermeiros. **Métodos.** A presente pesquisa quase-experimental foi realizada com 148 enfermeiros (76 no grupo de intervenção e 72 no grupo de controle) da província de Yazd (Irã). Os participantes foram recrutados em hospitais públicos nas cidades de Ardakan e Meibod. O instrumento de coleta de dados foi um questionário baseado nos construtos do HAPA e um questionário de habilidades de comunicação. Os dados foram coletados dos dois grupos antes, um mês depois e quatro meses após a intervenção. O grupo de controle não recebeu nenhum treinamento educacional durante o estudo. **Resultados.** No pré-teste, não foram encontradas diferenças estatisticamente significativas entre os grupos de intervenção e controle em termos de estágios comportamentais da comunicação eficaz com os pacientes. No pós-teste, a pontuação média de autoeficácia na tarefa aumentou significativamente no grupo de intervenção em comparação com o grupo de controle ($p<0.001$). A pontuação média de autoeficácia de enfrentamento também foi significativamente maior no grupo de intervenção do que no grupo de controle no pós-teste (**$p<0.001$**). Além disso, a pontuação média do planejamento de enfrentamento aumentou significativamente no grupo de intervenção após o pós-teste ($p<0.001$). A pontuação média em habilidades de comunicação também aumentou significativamente no grupo de intervenção em comparação com o grupo de controle no pós-teste ($p=0.03$). **Conclusão.** A intervenção usada no presente estudo com base no modelo HAPA melhorou significativamente a autoeficácia e as habilidades de comunicação dos enfermeiros do grupo experimental.

Descritores: autoeficácia; enfermeiro; abordagem do processo de ação em saúde; comunicação; intervenção educacional.

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Introduction

Nurse-patient relations are at the core of assessing the quality of nursing care provision. Besides care services, patients need empathy, understanding of personal needs, clarity of the treatment objective, awareness of the trend of the disease, and lower anxiety. These needs can be met if effective communication is facilitated.[1,2] Moreover, through effective nurse-patient communication, the patient trusts the therapeutic measures and adheres more to medical advice. If a nurse is very well aware of a patient's needs and feels this warmth and friendliness in communicating with the nurse, she/he can enjoy his/her stay in the hospital. This experience will, later on, affect the choice of the hospital to visit.[2] Despite the seemingly evident significance of nurse-patient relations, several studies reported a high rate of patient complaints about these relations.[3,4]

Similarly, different studies in Iran reported complaints about the quality of care and how the medical staff treats patients.[3,5,6] Universities offer courses to teach how to communicate effectively with patients. However, these instructions do not always translate into clinical attempts. A body of research found the prevalence of ineffective nurse-patient communication. Among the underlying reasons can be the nurses' underestimation of the relations, unawareness of the trend of disease, unwillingness to communicate, low self-confidence, and lack of communicative knowledge and skills.[6,7] Promoting communication skills requires a well-organized plan. Communication skill is acquisitional, similar to many other skills, and can be promoted via a comprehensive educational program and strategies to reduce communication barriers.[8] Using a theoretical framework or model can be an interventional strategy to achieve this goal. Using a framework or an approach acts as a map to achieve a goal.[9]

The Health Action Process Approach (HAPA) is a socio-cognitive model and a psychological framework in health education. This model was employed in the present study.[10] In this model, the behavior change process involves two motivational and a volitional phases. The former involves an individual's Intention to act in a certain way or change a high-risk behavior. The latter involves the Intention being turned into actual behavior and involves three further stages, initiation, maintenance, and recovery.[10] In the first motivational stage, an individual intends to do something. In this stage, the perceived threat is considered a primary precursor.[10] In the motivational stage, when the individual strikes a balance between the benefits and barriers of a certain behavior, expecting positive outcomes is always important. Moreover, to act as desired, she/he needs to fully believe in his/her capabilities, which is known as perceived self-efficacy. Perceived self-efficacy is positively correlated with the expected positive outcomes. Both are involved in forming Intention. Once the individual is willing to show a certain healthy behavior, Intention

is changed into detailed instructions. Therefore, the next stage should be analyzed into planning for action, coping, self-efficacy, and recovery.[10,11] There is research evidence that if someone aims to perpetuate a behavior, s/he needs appropriate planning and strategies to maintain the new behavior.

Many people intend to adopt a new behavior but quit it together for lack of the required planning. They, thus, easily turn back to their old behavior.[12] Considering the constructs within this approach, before promoting a certain behavior or quitting an old behavior, one needs to have a high perceived threat, positive outcome expectancy, and high self-efficacy. Once the new behavior is initiated, it is of utmost importance to maintain it. Thus, planning to maintain the target behavior is a key factor. The volitional phase of the HAPA requires interventions to increase coping self-efficacy, behavior planning, and coping planning.[13,14] A key property of this approach with HAPA is attention to the barriers to behavior planning and coping planning. The findings reported by Bodys-Cupak et al. showed that nursing students who had better planning and strategy use to manage their work challenges could better manage their stress during the training course.[13] In their research, Parle et al. used the outcome expectancy, self-efficacy, and self-regulation strategies to promote communication skills, which led to the doctors' and nurses' improved communication skills and self-regulation strategies.[15] A review of the interventional studies promoting nurses' communication skills showed that the focus in most studies had been more on the motivational aspect of the tendency toward a behavior change, and no regular plan has been made to promote communication skills.[16-19]

What seems to be lacking is a program based on a planned approach to remove barriers to communication. Many people tend to change their behavior. After a short while, unfortunately, due to the lack of planning, the new behavior does not persist, and the behavior change occurs just for a short time. Therefore, like other behavior change strategies, promoting communication skills requires planning.[12] As the HAPA consists of two phases, motivational and volitional, it can be used as an effective strategy for promoting communication skills. Therefore, this study aimed to enhance nurses' communication skills through an educational intervention based on the Health Action Process Approach.

Methods

Research Design and Participants

In the present quasi-experimental research, 148 nurses were selected to work in general wards [medical, Surgery, cardiac, women, and children] of two public hospitals in Ardakan and Meibod in Yazd province, Iran, in 2021. As some nurses from one hospital worked in multiple departments, randomization was not feasible, and the potential for shared educational interventions could impact the outcomes. Therefore, nurses from one hospital were selected randomly as the intervention group, and nurses from another hospital were chosen as the control group. Additionally, in terms of culture, education, and other demographic variables, there were no significant differences due to the proximity of the two hospitals. The intervention group received educational interventions based on HAPA, while no educational intervention was considered for the control group. The inclusion criteria were holding a diploma or higher and a nursing experience of at least six months in hospitals. The exclusion criteria were failing to respond to all questions or working part-time in the hospital. Besides, the participants were supposed to stay in the hospital for at least six months after questionnaire completion. Therefore, nurses who were prone to work force redundancy or termination of work, those working on a mission, and those who were pregnant and approaching childbirth were excluded from the study. All nurses who met the inclusion criteria were invited to participate in the study.

To prevent education bias and its effect on the control group, nurses from one hospital were assigned to the intervention group and those from the other hospital to the control group. Therefore, one hospital was randomly selected for the intervention and the other for the control. The randomization was performed using a coin flip, resulting in one hospital being selected as the intervention group and another as the control group. The sample size in each group was estimated at 61 with an attrition rate of 20% [n=13], an estimated error of α=0.05 and β=0.2. It was estimated at 74 using the following formula: . Therefore, a total number of 148 was finally set.

$$n = \frac{\left(z_{1-\alpha/2}+z_{1-\beta}\right)^2 [\sigma_1{}^2+\sigma_2{}^2/r]}{[\mu_1-\mu_2]^2}$$

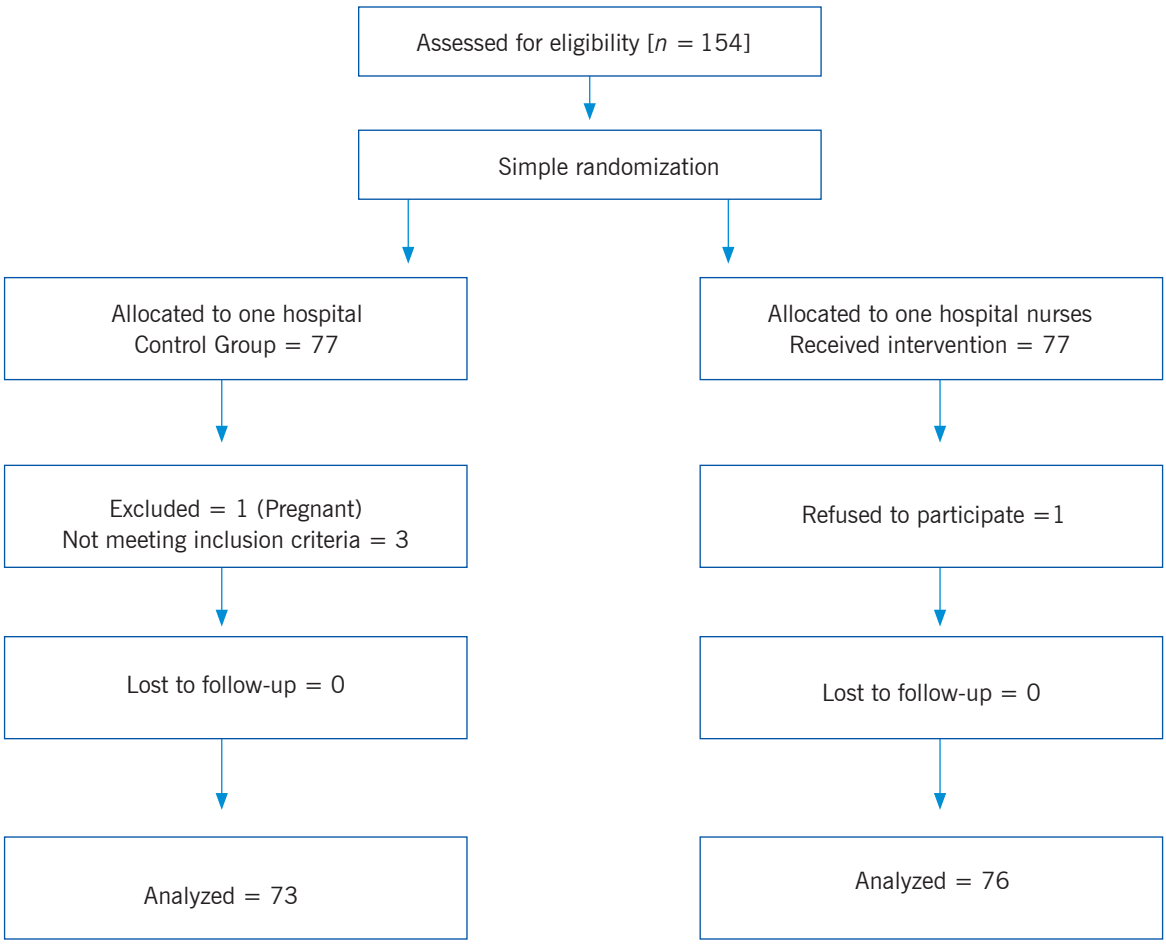

Figure 1. The flow diagram of the study

Data Collection and Instrumentation

The data collection instrument was comprised of three parts: (i) The participants' demographic information includes their age, sex, education, ward of affiliation, and work experience; (ii) The self-rating communication skills questionnaire with 26 items to measure a respondent's communication skills. The responses were scored between 0 and 100. The minimum score for communication skills was 0, and the maximum score was 2,600. The reliability and validity of the questionnaire were already substantiated in the previous study.[20]

The communication skills questionnaire based on HAPA: The researcher-made HAPA questionnaire was developed based on the perceived threat, outcome expectancies, task self-efficacy, Intention, behavior planning, coping self-efficacy, coping planning constructs. Each scale consisted of a stem and several items. The respondents were asked to read the branch and answer the items on a 5-point Likert scale. The CVI (0.89) and CVR (0.79) were estimated to test the content validity. To this aim, eight health education and promotion experts were consulted to comment on the item's simplicity, relevance, and clarity. The instrument was also checked for internal consistency, using Cronbach's alpha. This value was estimated above .7, and the results can be seen in the study published by Ardakani *et al*.[21]

Intervention

Before the intervention, the control and intervention group nurses both responded to the communication skill and HAPA questionnaires. Then, the intervention began in two phases intending to promote communication skills:

(i) The motivational phrase. The education aiming to increase Motivation for promoting communication skills was implemented in this phase. During these sessions, comprehensive educational methods were used, such as lectures, group discussion, sharing of communication experiences in the presence of nurses who had successfully communicated with patients. This phase took 2-hour sessions held in 4 weeks. Meanwhile, these sessions were not fit for the control group for any teaching of communication skills in the hospital. Immediately after the educational intervention in the motivational phase, part of the questionnaire developed based on the HAPA, including the motivational stage [task self-efficacy, Intention, outcome expectancy, and perceived threat] was provided for nurses in the intervention and control groups.

(ii)The volitional phase. In this phase, nurses in the intervention group were selected based on the results of the motivational phase to enter the volitional phase. To this aim, again, all nurses in the intervention group were invited to take part in 3 more sessions, each taking 2 hours long. In these additional sessions, the principles of communication skills were taught according to the constructs of the volitional phase. The educational content addressed the barriers to verbal and nonverbal communication and the basics of effective nurse-patient communication. After the educational intervention, the nurses were asked to record communicating with patients using an evaluation checklist. Nurses were supposed to rate their level of communicating with patients, such as effective listening to patients, empathy, verbal communication, and nonverbal communication, by assigning a score to each. They were also asked to describe their spirits, thoughts, and feelings while communicating with patients.

This self-rating evaluation checklist was developed based on a book on the essential communication skills for nurses[22] and the reflection model.[23] Nurses evaluated themselves by recording their thoughts, feelings, and insights. They got aware of their positive and negative perceptions and attitudes. This awareness helped them reinforce positive emotions and reduce the negative. If it was hard for them to write down the details, an Android application was also developed to be easily installed on mobile phone devices to be used

daily for 30 days. Also, head nurses held within-ward sessions on how to implement the program to support communication skills adequately. Again, one month after the classes, all nurses (in the intervention group and controls] were asked to respond to the questionnaire developed based on the volitional phase [coping self-efficacy, behavior planning, and coping planning]. Four months after the intervention, all control and intervention groups participants were asked to complete a questionnaire comprised of the coping self-efficacy, coping planning constructs, and the communication skills questionnaire.

Data analysis

To statistically analyze the data, SPSS18 was used. Paired-samples and independent-samples T-tests were run to test the within- and between-group differences in the scores of HAPA constructs and communication skills. Besides, one-way ANOVA was used with repeated measures to compare the coping self-efficacy and coping planning scores in three points of time at the $p<.05$ significance level.

Ethical Considerations

The participants were ensured of the confidentiality of the information they provided. Then, they were provided with questionnaires to fill out. Participation in the study was voluntary. The ethical committee approved the Yazd University of medical sciences [#IRSSU.SPH.REC.1395.76].

Results

Among the 148 participants in this research, 76 were assigned to the intervention and 72 to the control group. The mean age of the nurses was 33.88±7.24 years (R=22-52). Their mean length of work experience was 10.57±8 years (R=1-27). No statistically significant difference was found between the two groups before the intervention in terms of age, sex, work experience and education. (Table 1)

Table 1. Socio-demographic distribution by study groups

Variables	Categories	Intervention group *n* (%)	Control group *n* (%)	Total *n* (%)	X^2	*p*-value
Sex	Male	9 (6.1)	5 (3.4)	15 (9.5)		
	Female	67 (45.3)	67 (45.3)	134 (90.5)	1.03	0.22
Education	Diploma	8 (10.5)	5 (6.9)	13 (8.8)		
	Associate degree	4 (5.3)	3 (4.2)	7 (14.7)		
	Bachelor's degree	60 (78.9)	59 (81.9)	119 (80.4)	0.94	0.87
	Master's degree	4 (5.3)	5 (6.9)	9 (6.1)		

The results indicated in Table 2 show the difference between the research groups in the behavioral stages before the intervention in the pretest. Overall, in both groups, 6.8% belonged to the pre-intention, 19.6% to the Intention, and 75.9% to the behavioral stages. Moreover, according to Table 3, no one from the intervention group was in the pre-intention stage after the motivational intervention. The nurses' affiliation with the behavioral stages was significantly different from the control group ($p<0.001$). As shown in the Table 3, the mean score of perceived threat was significantly higher in the control group before the intervention ($p=0.05$). Also, the motivational intervention led to no significant increase in the outcome expectancy in the intervention group ($p=0.21$). However, the increased mean difference in this group was statistically significant compared to the control group ($p=0.06$). The mean scores of behavioral Intention, task self-efficacy, and behavior planning in the two groups were not significantly different before the intervention, after the motivational intervention and the planning intervention, the mean scores of behavioral Intention ($p<0.001$), task self-efficacy ($p<0.001$) and behavior planning ($p<0.001$) showed a statistically significant increase in the intervention group compared to the control

Table 2. Between-group comparison of effective communication skills based on chi-squared test results before the intervention

Behavioral Stages of Effective Nurse-patient Communication Before Intervention	Intervention group		Control group		Total		X^2	*p*-value
	%	*n*	%	*n*	%	*n*		
No intention for effective communication	6.6	5	6.9	5	6.8	10	1.12	0.77
They were eager to learn effective communication skills (intention stage)	18.4	14	20.8	15	19.6	29		
They attempted to communicate effectively but found it hard.	27.6	21	33.3	25	30.4	45		
It was easy for them to communicate effectively.	47.4	36	38.9	28	43.2	64		

Table 3. Between-group comparison of the model constructs before and immediately after the motivational phase

Variables		Mean±SD		Independent-samples T-test
		Intervention group	Control group	
Perceived threat	Before intervention	8.07±53.78	5.75±55.87	t=-1.97, *p*=0.05
	After intervention	5.75±55.87	8.54±57.69	t=-0.41, *p*=0.68
	Mean difference Student t test *p*-value	3.39±6.74 4.38 <0.001	1.61±9.27 1.47 0.14	t=1.34, *p*=0.18
Outcome expectancies	Before Intervention	3.37±36.36	3.37±37.52	t=-1.66, *p*=0.1
	After intervention	3.14±36.88	4.31±36.52	t=0.62, *p*=0.54
	Mean difference Student t test *p*-value	0.394±2.74 1.25 0.21	-0.81±4.95 1.40 0.16	t=1.85, *p*=0.06
Task self-efficacy	Before Intervention	4.14±26.38	3.42±27.45	t=-1.77, *p*=0.09
	After intervention	3.01±29.06	4.75±27.47	t=3.26, *p*<0.001
	Mean difference Student t test *p*-value	3.22±4.14 7.67 0.001	0.013±4.72 0.02 0.98	t=4.59, *p*<0.001
Intention	Before intervention	3.15±0.95	3.04±0.94	t=0.74, *p*=0.46
	After intervention	3.46±0.59	2.98±0.98	t=3.56, *p*<0.001
	Mean difference Student t-test *p*-value	0.3±0.61 4.31 0.001	0.05±0.42- 0.42 0.67	t=2.46, *p*=0.015

According to the findings summarized in Table 4, the mean score of communication skills was significantly increased in the intervention group after the intervention compared to the control ($p=0.03$).

Table 4. Comparison of communication skills between groups before and four months after the intervention

	Mean±SD		
	Intervention group	Control group	Independent-sample t-test
Before Intervention	2185.13±251.06	2204.98±205.88	t=-0.52, *p*=0.60
After intervention	2287.57±220.26	2210.26±219.06	t=2.14, *p*=0.03
Mean difference Student t-test *p*-value	102.44±190.68 4.68 0.001	5.27±190.68 0.18 0.85	t=2.67, *p*=0.008

The mean score of coping self-efficacy in the intervention group one and four months after the intervention was significantly increased. The effect size was high ($p<0.001$). This increased difference was not observed in the mean score of the control group ($p=0.64$). The intervention in the volitional phase and stress management programs led to an increase in the mean coping self-efficacy score among nurses in the intervention group. The increased mean score of coping planning was a statistically significant one and four months after the intervention ($p<0.001$). This difference between the mean scores of nurses in the control group was not statistically significant ($p=0.95$) (Table 5).

Table 5. Between-group comparison of the coping score before, 1 and 4 months after the intervention

Variables		Before Intervention Mean±SD	1 month after Intervention Mean±SD	4 months after intervention Mean±SD	F	*p*-value	Partial Eta squared
Coping self-efficacy	Intervention	29.05±5.11	32.96±3.86	33.40±3.58	44.34	0.001	0.54
	Control	30.22±4.1	30.88±4.36	30.98±3.66	0.81	0.64	0.01
	p-value*	0.13	0.003	0.001			
Coping planning	Intervention	24.09±5.36	27.57±3.03	27.82±2.97	25.93	0.001	0.41
	Control	25.75±5.06	25.55±4.46	25.54±4.17	0.48	0.95	0.001
	p-value*	p=0.13	p=0.003	p<0.18			

* Independent-samples t-test *p*-value

Discussion

This study aimed to enhance the communication skills of nurses using HAPA. The results revealed that education intervention led individuals in the intervention group to progress from the pre-intentional stage to the intention stage significantly more than the control group.

Moreover, the number of people in the intervention group who found it easy to communicate was significantly increased compared to the control group. The present findings prove the effectiveness of the intervention in improving nurses' willingness to acquire communication skills and promote communication skills. No such difference was found within the control group. Thus, it can be concluded that the motivational intervention managed to increase nurses' tendency to learn communication skills.

Many studies have been conducted so far based on the HAPA. However, in none of them, the phase to which the participants belong is mentioned. Yet, in their study, Joveini *et al*.[24] compared intenders and non-intenders. In this research, hookah smokers took part in an educational intervention in which the Motivation for ceasing hookahs and the perceived threat of the habit were investigated. The results confirmed the HAPA constructs, and after the educational intervention, the students in the intervention group showed a higher tendency to cease hookah smoking. These interventions were all based on the significance of communication skills in lowering the risks of ineffective communication. These include no diagnosis of background diseases, delayed diagnosis of a medical condition, and complaints about the quality-of-care services. As investigated and reported by the patient security committee, the main reason for 66% of medical errors is the

lack of effective nurse-patient communication.[24] Previous studies explored the correlation between perceived threat and health-protective behaviors and showed that a higher perceived threat is accompanied by more participation in showing health-related protective behaviors.[25] Those who better communicate with patients are more susceptible to the threat of ineffective communication.[26,27] According to Schwartz, the minimum perceived threat level should exist in people who have not yet intended to communicate effectively.[12] In the present research, statistically significant differences were found in perceived threat before and after the intervention in the intervention group. This difference shows the effectiveness of the educational intervention in keeping nurses aware of the significance of effective communication. As also emphasized in the HAPA, the perceived threat is a construct that, if increased, can push people towards risk avoidance behaviors or promotive behaviors. In the research work by Lhakhang *et al*.,[28] contrary to the present study, the intervention did not manage to increase perceived threat because decision-making interventions were used rather than promotive interventions to affect perceived threat. In their research, Zhang *et al*. reported a significantly higher perceived threat score in the intervention group [than the control], consistent with the present finding.[29]

In the present research, participants in both groups had a high outcome expectancy score. After the intervention, no statistically significant difference was found between the outcome expectancy score of the two groups. Thus, the intervention did not increase the mean score of the participants' outcome expectancy. No increase in the mean outcome expectancy score can be due to the high outcome expectancy before the intervention. Before the intervention, 90% of the maximum score was gained. Nurses believed that showing effective communicative skills could improve their life and work objectives. Liu et al. aimed to explore the effect of an educational intervention for communicative skills in nurses in charge of patients with cancer. They observed a significant increase in the outcome expectancy of the intervention group. The nurses gained 73% of the maximum outcome expectancy score.[30] In the present study, participants in both groups had a high task self-efficacy score. After the intervention and teaching communication skills, the mean score of task self-efficacy was significantly increased in the intervention group. This finding indicates the increased level of nurses' self-belief in communicating effectively. Some other studies employed different modes of educational intervention such as role-play, lecture, and self-rated communication skills. They managed to increase nurses' self-efficacy in communication skills after the intervention compared to before the intervention. This is consistent with the present finding.[17,31]

The ineffective belief communication can be increased by teaching the key factors involved and identifying barriers to effective communication such as different age groups, sexes, cultures, and shared experiences of lacking effective communication with patients. In a study conducted by Owen and Rowbotham, which aimed to explore the effect of education through simulation, nurses showed higher communication self-efficacy after the educational intervention than the control group.[32] As pinpointed by Bong, teaching specific skills, representations, and role-plays can help improve people's skills and self-efficacy in showing the target behavior.[33]

In the present research, the mean score of behavioral Intention was significantly increased in the intervention group than in the control group. Similarly, Chiang *Et al*. investigated an increase in the physical activity of patients with spinal injury and realized that the intervention managed to increase behavioral Intention in the intervention group.[34] This is consistent with the present research. The findings summarized in Table 5 showed that the mean coping self-efficacy score was significantly higher in the intervention group than the control in two-time points [1 and

4 months after the intervention]. Interventional measures can help promote coping self-efficacy through planning to cope with barriers, create perceived capability and emphasize problems such as hard work, business with work, and willingness to return to old habits or behaviors.

In the present research, no statistically significant difference was found between the two groups in the mean score of planning for action before the intervention. However, after the educational intervention, the mean score of action planning was significantly higher in the intervention group than in the control. The mean score of planning for behavior was significantly decreased in the control group. These findings show that the intervention effectively increased the mean score of participants' planning for behavior. This finding is consistent with a study by Lhakhang *et al*., which showed that the recommended level of planning for action was higher in the experimental group than the control Cwith no intervention).[28] Moreover, Rashids and Alshehari *Et al*.'s design and planning led to better action taken by nurses to wash their hands.[35]

Another research finding was the significantly higher level of communication skills in nurses in the intervention group than in control. In this research, nurses rated communication skills in a questionnaire. Nurses in the intervention group rated their communication skills higher than their peers in the control group. Through lectures, role-play, and educational movies, promoting communication skills and self-rating was based on an evaluation checklist. Promoting communication skills were found in other studies too. In their research, Devi *et a*l. reported the effectiveness of an intervention based on a video self-rating procedure in improving nursing students' communication skills.[36] Many studies used multiple interventional methods to promote communication skills. Liaw *et a*l. used a communication skill, self-regulation, problem-solving and emotional support curriculum to promote university students' communication skills.[37,38] Their finding was consistent with the present research. The scores for other constructs of the model obtained from the self-rating questionnaire showed the effectiveness of the educational intervention in the experimental group. So far, the existing literature on HAPA has only dealt with the predictors of a specific behavior. The effect of educational interventions has not been reported.

In the present study, using the intervention based on the HAPA proved to promote nurses' communication skills. Therefore, it is suggested that multiple ways be used to identify barriers to communication and can, thus, help encourage communication skills. An essential point in this research is the nurses' different degrees of interest in rating critical thinking. This difference led to the development of an application for self-rating communication skills and a booklet along with a self-rating evaluation checklist.

One limitation of this research was the use of self-rating to assess communication skills. In other words, nurses might have overestimated their communication skills. Therefore, a more realistic view can be provided by using different methods to assess communication skills. Moreover, due to the limited sample [to two hospitals], analysis of the HAPA constructs was done only quantitatively. It is suggested that similar interventions be made in larger hospitals with more patients and use the randomization technique to provide more realistic results. Based on recent studies, it is recommended that if communication skills are not at an optimal level in a department or hospital, utilizing educational intervention based on HAPA can guide individuals through communication stages effectively. Additionally, assessing the interventions impact through methods such as 360-degree evaluation is suggested.

Conclusion: The study revealed that HAPA-based intervention can improve nurses' communication skills and can be used as an intervention method.

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Investigation of environmental ethics, spiritual health, and its relationship with environmental protection behaviors in nursing students

Original Article

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Investigation of environmental ethics, spiritual health, and its relationship with environmental protection behaviors in nursing students

Abstract

Objective. To investigate the relationship between environmental ethics, spiritual health, and environmental behavior among nursing students . **Methods.** In this cross-sectional study, 200 iranian students from the Chabahar Nursing School were selected using a simple random sampling method. The data collection tool included a questionnaire on demographic information, knowledge, attitudes and behaviors towards the environment, environmental ethics, and spiritual health. Partial least squares structural equation modeling (PLS-SEM) was utilized to evaluate the conceptual framework in this study. **Results.** The mean score for environmental ethics among nursing students was 65.73±10.61 out of 100. Most of the students (47%) had desirable environmental ethics. The knowledge structure (β=0.46) predicted

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attitude. The attitude structure also predicted environmental behavior (β=0.28) and spiritual health (β=0.31). Ultimately, the results showed that spiritual health and environmental ethics predict environmental behavior directly and indirectly (p<0.001). **Conclusion.** Spiritual health and environmental ethics were strong predictors of environmental behavior. Therefore, it is necessary to take into account not only students' spiritual health but also their ethical behaviors to promote environmental protection behaviors in the future.

Descriptors: attitude; behavior; environmental ethics; environmental protection; knowledge; nursing students; spiritual health.

Investigación sobre ética ambiental, salud espiritual y su relación con comportamientos de protección ambiental en estudiantes de enfermería

Resumen

Objetivo. Investigar la relación entre la ética ambiental, la salud espiritual y el comportamiento ambiental entre los estudiantes de enfermería. **Métodos.** En este estudio transversal se seleccionaron 200 estudiantes iraníes de la Escuela de Enfermería de Chabahar mediante un método de muestreo aleatorio simple. La herramienta de recogida de datos incluía un cuestionario sobre información demográfica, conocimientos, actitudes y comportamientos hacia el medio ambiente, ética medioambiental y salud espiritual. Se utilizó el modelo de ecuaciones estructurales por mínimos cuadrados parciales (PLS-SEM) para evaluar el marco conceptual de este estudio. **Resultados.** La puntuación media en ética medioambiental entre los estudiantes de enfermería fue de 65.73±10.61 sobre 100. El 47% de los estudiantes tenían una ética medioambiental deseable. La estructura de conocimientos (0.46) predijo la actitud. La estructura de la actitud también predijo el comportamiento medioambiental (0.28) y la salud espiritual (0.31). En última instancia, los resultados mostraron que la salud espiritual y la ética medioambiental predicen el comportamiento medioambiental directa e indirectamente (p<0.001). **Conclusión.** La salud espiritual y la ética medioambiental fueron fuertes predictores

del comportamiento medioambiental. Por lo tanto, es necesario tener en cuenta no sólo la salud espiritual de los estudiantes, sino también sus comportamientos éticos para promover conductas de protección del medio ambiente en el futuro.

Descriptores: actitud; conducta; environmental ethics; environmental protection; conocimiento; estudiantes de enfermería; spiritual health.

Pesquisa sobre ética ambiental, saúde espiritual e sua relação com comportamentos de proteção ambiental em estudantes de enfermagem

Resumo

Objetivo. Investigar a relação entre ética ambiental, saúde espiritual e comportamento ambiental entre estudantes de enfermagem. **Métodos.** Neste estudo transversal, 200 estudantes da Escola de Enfermagem de Chabahar (Irã) foram selecionados usando um método de amostragem aleatória simples. A ferramenta de coleta de dados incluiu um questionário sobre informações demográficas, conhecimento, atitudes e comportamentos em relação ao meio ambiente, ética ambiental e saúde espiritual. A modelagem de equações estruturais por mínimos quadrados parciais (PLS-SEM) foi usada para avaliar a estrutura conceitual deste estudo. **Resultados.** A pontuação média sobre ética ambiental entre os estudantes de enfermagem foi de 65.73±10.61 de um total de 100. 47% dos estudantes tinham uma ética ambiental desejável. A estrutura de conhecimento (0.46) previu a atitude. A estrutura da atitude também previu o comportamento ambiental (0.28) e a saúde espiritual (0.31). Por fim, os resultados mostraram que a saúde espiritual e a ética ambiental previram o comportamento ambiental direta e indiretamente ($p<0.001$). **Conclusão.** A saúde espiritual e a ética ambiental foram fortes preditores do comportamento ambiental. Portanto, é necessário considerar não apenas a saúde espiritual dos alunos, mas também seus comportamentos éticos, a fim de promover comportamentos de proteção ambiental no futuro.

Descritores: atitude; comportamento; environmental ethics; environmental protection; conhecimento; estudantes de enfermagem; spiritual health.

Introduction

Today, human destructive activities are more threatening to biodiversity, stability, and balance of the environment than any other factor. Environmental protection has become a major challenge in developing and third-world countries.[1] The relationship between humans and nature has never been as precarious and threatening as today. The rapid pace of technological development and changes in human lifestyles on the one hand, and the delay in economic, cultural, and ethical planning aimed at reducing their adverse effects on the other, have led to a series of environmental abnormalities and subsequent concerns among environmentalists, social thinkers and policymakers.[2] Human environmental behaviors have caused various destructive behaviors, including the unrestricted use of energy in homes, personal transportation, single-use production, and improper waste disposal. Currently, human environmental behavior is recognized as one of the most influential factors in the environment, which has drawn the attention of many environmental sociologists.[3,4] Environmental improvement can only be achieved when humans' natural and cultural environments are interconnected. The necessary step towards achieving this goal is to have environmental ethics encompassing all society segments. Environmental ethics involves ideal human behavior toward their living environment, including natural, social, and cultural environments.[5] Some researchers explicitly state that the current environmental crises are a crisis of values and ethics, which calls for an ethical solution.[5] It is important to note that the relationship between individuals of any society with nature and the environment can be either responsible and ethical, utterly irresponsible and unethical, or sometimes something in between.[5]

Identifying the effective factors is the first step toward a change in environmental protection behavior. One of the predictors of environmental behaviors is spiritual health.[6] Some researchers believe that spiritual health, which is the core of human health, contributes significantly to humans' growth and development.[7-9] Spiritual health is defined as a feeling of connection with others, having meaning and purpose in life, and having belief and connection with a higher power.[10] Through the connection with a higher power and the creation of goals in life, spiritual health can promote responsible environmental behavior. When people feel that their behavior is under the supervision of a higher power that has created the world for the benefit of all human, plant, and animal generations, they gain a complete understanding of nature and its preservation. Accordingly, they commit themselves to protecting the environment as a top priority.[11]

On the other hand, environmental protection can be considered as one of the crucial responsibilities of students. Creating a healthy environment requires a group of students capable of building relationships with local communities and helping protect the environment. They must be enthusiastic about educating

those who are indifferent to the environment or engage in environmentally risky behaviors. In short, thanks to their role as efficient actors in the social arena, students can be the founders of knowledge-raising movements, positive social movements, and appropriate environmental behavior in the field of environmental protection in society. Ministry of Health and Medical Education strongly emphasizes the spiritual health of medical students from various fields.[12] Furthermore, spiritual health is closely associated with the development of responsible attitudes toward the environment, which ultimately affects environmental behavior.[6] In this light, this study sought to determine the relationship between environmental ethics and spiritual health, and environmental behavior among nursing students.

Methods

This descriptive-analytical cross-sectional study included nursing students in Chabahar as its statistical population. Also this study was conducted from October 2022 to March 2022. The inclusion criteria were as follows: willingness to participate in the study and admission to the university before September 2022. Final-year students were excluded from the study.

$$n = \frac{z^2_{1-\alpha/2} \times p(1-p)}{d^2}$$

According to the prevalence of 6% of the environmental protection behavior in the study of Majdi Yazdi et al.[13] and considering the error rate of 0.05%, alpha of 5%, the sample size was determined to be 90 people. However, 200 additional participants were included in the study to compensate for any potential sample loss.

After obtaining a list of students who entered the program prior to September 2022 from the school's education department, a random sampling of students was conducted. If some individuals were dissatisfied, the selection procedure continued randomly until the predetermined sample size (200 individuals) was reached. This study employed a demographic information questionnaire, a researcher-made questionnaire for assessing environmental knowledge and behavior, Abedi Servestani's Environmental Ethics Questionnaire,[14] and Paloutzian and Ellison's standardized Spiritual Well-being Scale.[15] The demographic questions included information related to age, gender, father's education, mother's education, marital status, father's occupation, mother's occupation, household income, and place of residence.

Section 1. Participants were asked to complete a questionnaire to assess their knowledge, attitudes, and behaviors regarding environmental issues. The questionnaire was researcher-made and consisted of 15 knowledge questions that were scored based on correct, incorrect, and "I don't know" responses (2 points for correct, 1 point for "I don't know," and 0 points for incorrect responses). The total score ranged from 0 to 30. The attitude section contained 16 Likert scale questions with five response options ranging from "strongly agree" to "strongly disagree." The questions were scored from 1 to 5, and the total score ranged from 16 to 80. A total of 14 items were included in the behavior section, which was scored based on "always," "sometimes," and "never" responses. The total score ranged from 14 to 42.

As a first step, the validity of the questionnaire was assessed by sending it to 10 relevant experts. They calculated the content validity ratio and index, and necessary corrections were made based on their feedback. The content validity ratio for knowledge, attitude, and behavior questions was 0.71, 0.85, and 0.83, respectively. The content validity index for knowledge, attitude, and behavior questions was 0.79, 0.71, and 0.86, respectively. Cronbach's alpha test was used to determine the reliability of the questionnaire. The results showed Cronbach's alpha values of 0.90 for knowledge, 0.93 for attitude, and 0.70 for behavior, which were all confirmed.

Section 2. Servestani *et al.*[14] Environmental Ethics Questionnaire was administered, consisting of 20 questions on a five-point Likert scale ranging from "strongly agree" to "strongly disagree." The total score ranged from 20 to 100, with scores of 20-44 indicating undesirable environmental ethics, 45-74 indicating relatively undesirable environmental ethics, and 75-100 indicating desirable environmental ethics. Regarding reliability, this questionnaire had a Cronbach's alpha value of 0.87.

Section 3. Polotzien and Ellison's Spiritual Well-Being Scale (SWBS)[15] composed of 20 questions scored on a five-point Likert scale ranging from "strongly agree" to "strongly disagree." The total score ranged from 20 to 100, with scores of 20-40 indicating poor spiritual health, 41-99 indicating average spiritual health, and 100-120 indicating good spiritual health. According to Cronbach's alpha test, the questionnaire exhibited a scientific reliability of 0.80. SPSS 16.0 software was used to analyze the data in this study. The analysis included descriptive statistics (mean, standard deviation, frequency, and percentage) and analytical methods, such as the Kolmogorov-Smirnov test (to determine the normality of data), Pearson correlation coefficient, Spearman correlation coefficient, and multiple linear regression. Partial least squares structural equation modeling (PLS-SEM) was utilized to evaluate the conceptual framework in this study. The structural measurement model was tested using SmartPLS version 3 statistical software. Results were considered statistically significant at a level of $p<0.05$.

Ethical Considerations. Ethical approval was obtained from the Human Research Ethics Committee at the Iranshahr university of medical sciences. All study participants provided written informed consent. Confidentiality and anonymity were ensured. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration. Also, this study was approved by the Research Ethics committee of Iranshahr university of medical sciences (code: IR.IRSHUMS.REC.1401.027).

Results

A total of 130 students participated in the study, with a mean age of 21.3±1.7 years, and 62% were female. Regarding educational background, 24% of the fathers were high school graduates, and 33% were university graduates. Also, 23% of the mothers were high school graduates. An overview of demographic variables is presented in Table 1.

Table 1. Demographic information and baseline characteristics of study participants

Variable	Variable categories	*n* (%)
Gender	Male	76 (38)
	Female	124 (62)
Marital status	Single	187 (93.5)
	Married	13 (6.5)
Father's education level	Illiterate	29 (14.5)
	Elementary	32 (16)
	Guidance	36 (18)
	High school	48 (24)
	University	66 (33)
Mother's education level	Illiterate	41 (20.5)
	Elementary	32 (16)
	Guidance	36 (18)
	High school	47 (23.5)
	University	44 (22)
Father's job	Employee	84 (42)
	Free	116 (58)
Mother's job	Employee	40 (20)
	Housewife	160 (80)
Income	< 2 million tomans*	18 (9)
	2 to 4 million tomans	68 (34)
	> 4 million tomans	114 (57)
Place of residence	Native	127 (63.5)
	non-native	73 (36.5)

*1Toman = 52 US dollar in 2024

The results of the current study showed that the mean score for environmental ethics among students was 65.73±10.61 out of 100. Most students (47%) had desirable environmental ethics in the classification of environmental ethics. Based on the results, the mean score for spiritual health was 94.81±13.48 out of 120. Most students (53%) had average spiritual health (Table 2).

Table 2. Status of Environmental Ethics and Spiritual Health among Study Participants

Variable	Variable categories	*n* (%)	Mean ±SD	Range of scores
Environmental ethics	Undesirable	34 (17)	65.73±10.61	20-44
	Relatively undesirable	72 (36)		45-74
	Desirable	94 (47)		75-100
Spiritual Health	Weak	7 (3.5)	94.81±13.48	20- 40
	Average	106 (53)		41-99
	Good	87 (43.5)		100-120

Table 3 demonstrates the relationship between demographic variables and environmental structure. Clearly, a significant positive correlation was found between age and knowledge (r=0.17, $p<0.001$). Environmental ethics was strongly correlated with attitude (r=0.48, $p<0.001$), spiritual health (r=0.61, $p<0.001$), and environmental behavior (r=0.58, $p<0.001$). Additionally, knowledge showed a significant positive correlation with environmental ethics, indicating that an increase in knowledge was associated with an increase in environmental ethics (r=0.14, $p<0.001$).

Table 3. Distribution of correlation between demographic variables and environmental-related constructs

	Environmental ethics	Attitude	Spiritual health	Behavior	Knowledge
Age	0.07	-0.04	0.028	-0.09	0.171*
Father's education level	-0.06	0.09	-0.07	0.14	-0.01
Mother's education level	-0.04	-0.023	0.06	0.04	0.023
Income	0.125	-0.021	-0.05	-0.03	0.14
Environmental ethics	1.00	0.48**	0.614**	0.588**	0.143*
Attitude		1.00	0.266**	0.477**	0.511**
Behavior				1.00	0.177*

(*) Weak positive correlation, (**) Strong positive correlation

Table 4 provides the results of the significance test for the path coefficient of the structural model. As observed, the t-values were greater than 1.64, indicating that the hypotheses are confirmed at the 90%, 95%, and 99% confidence levels. Knowledge (β=0.46) predicted environmental ethics ($p<0.001$), and environmental ethics (β=0.14) correlated with environmental behavior ($p<0.001$). Furthermore, attitude (β=0.28) and spiritual health (β=0.31) predicted environmental behavior ($p<0.001$), and spiritual health predicted environmental ethics (B=0.28, $p<0.001$). Also, environmental ethics predicted environmental behavior (β=0.42, $p<0.001$). Figure 1 illustrates the path coefficients and their significance between variables that predict environmental behavior.

Table 4. Results of relevant statistics for the path coefficient

Variables	Path coefficient	t values	Standard deviation (STD)	*p*-value	Results
The relationship between knowledge and attitude	0.464	9.49	0.057	<0.001	Supports communication
The relationship between attitude and behavior	0.288	5.85	0.058	<0.001	Supports communication
The Relationship between Ethics and spiritual health	0.70	16.06	0.042	<0.001	Supports communication
The relationship between ethics and behavior	0.423	6.745	0.064	<0.001	Supports communication
The relationship between attitude and spiritual health	0.313	6.06	0.064	<0.001	Supports communication
The relationship between spiritual health and behavior	0.39	3.09	0.058	0.002	Supports communication
The relationship between knowledge and ethics	0.145	2.57	0.056	0.01	Supports communication
The relationship between knowledge and behavior	-0.098	1.82	0.054	0.07	It does not support communication

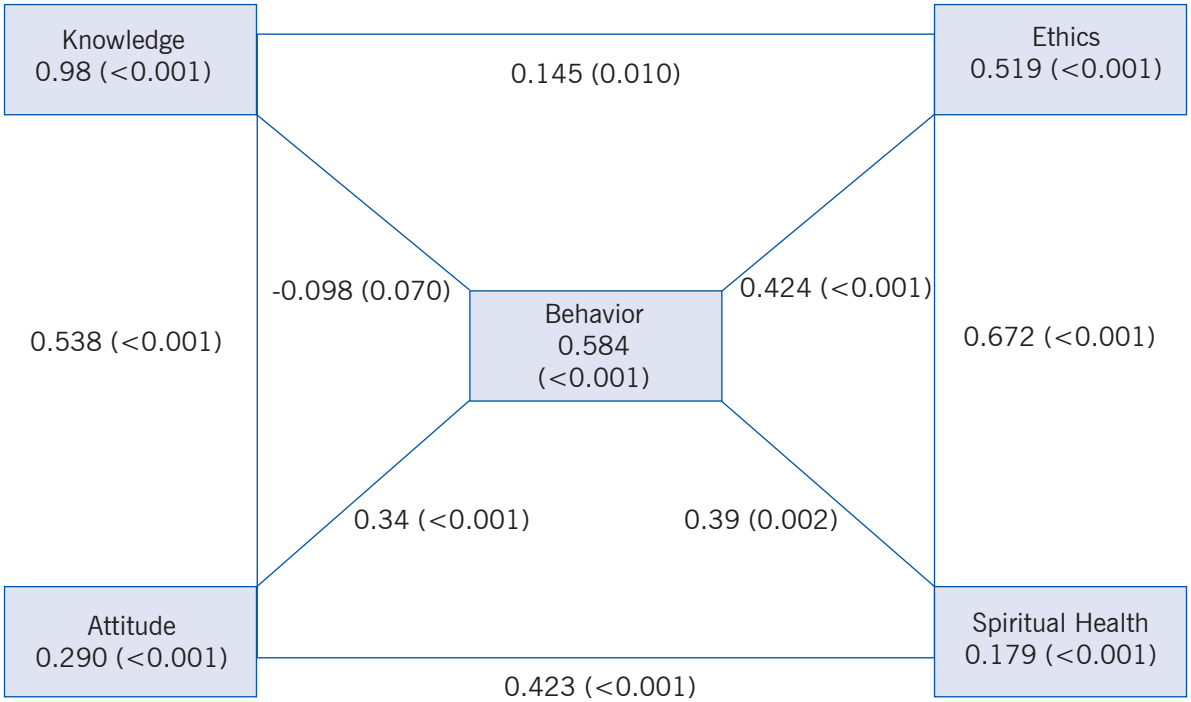

Figure 1. Partial least square SEM results; estimated path coefficients and their significance levels loaded on the pathways

Discussion

In the 21st century, many environmental researchers have recognized human environmental behaviors as one of the most important and influential factors in the environment. The present study was conducted to determine the relationship between environmental ethics, spiritual health, and environmental behavior. The results showed that most students (47%) had desirable environmental ethics. This finding is consistent with that of Shahvali *et al*.,[16,17] who evaluated environmental ethics in students as acceptable and desirable. Environmental ethics are determining principles that govern human-nature relationships, create internal barriers against improper actions, and convince individuals that other creatures deserve life, freedom, and enjoyment of existence.[18] Therefore, the desirability of environmental ethics in students can effectively promote nature-appropriate conduct.

Based on the analysis of spiritual health, most students were found to have average spiritual health (53%). Similarly, Zareipour and Gholamnia *et al*.[19,20] reported average spiritual health among medical science students. During patient care and hospitalization, medical science students should accompany patients. Therefore, students with high spiritual health can positively influence the general health of their patients by offering support and addressing their spiritual needs, along with improving their spiritual health.

This study demonstrated that age and environmental knowledge were positively correlated. This finding is in agreement with those of Casaló *et al.*[21] and Mirfardi *et al.,*[22] suggesting that older individuals have a greater knowledge of their environment. Older students' environmental knowledge, rationality, and foresight are significantly higher than younger students. Moreover, older students have more experience and knowledge about the environment, which contributes significantly to promoting responsible environmental behavior. This research examined the relationship between spiritual health, environmental ethics, and behavior. The results showed that the higher the level of spiritual health among students, the more desirable their environmental ethics and behavior were. Moreover, the hypothesis regarding the relationship between spiritual health, environmental ethics, and behavior was confirmed. Agbim *et al*.[23] demonstrated a significant correlation between the behavioral characteristics of spiritually-minded people and their ethical behavior. Anser *et al*.[24] also found that higher spiritual levels were associated with better environmental behavior. Kazemzadeh *et al*.[25] reported a direct and significant statistical relationship between spiritual health and ethical behavior in students, which is consistent with the present study's findings. Therefore, spiritual health leads to the formation of responsible attitudes towards the environment and ultimately affects the responsible environmental behavior of students.

In the present study, knowledge directly predicted attitudes, ethics, and environmental behavior. This finding is consistent with Liu and Mahboobi *et al*.'s studies,[16,26] which demonstrated that environmental knowledge positively affects ethical and environmental behavior. Individuals with greater environmental knowledge are more sensitive to the environment. Thus, they are more likely to adopt positive attitudes and behaviors that contribute to the preservation of the environment. There is a direct and indirect relationship between attitude, environmental ethics, and environmental behavior, which is consistent with the studies by Jekria and Hansman.[27,28] Attitude refers to individuals' emotions, tendencies, beliefs, and judgments about environmental phenomena or events in life and their readiness to engage in environmental behavior. As the most important determinant of behavior, it is a powerful motivator for participating in environmental development activities and protecting the environment. In other words, individuals with an inclination towards environmental conservation (environmental attitudes) are more sensitive to environmental concerns. Moreover, individuals who have a positive attitude toward environmental issues are more likely to adopt environmental protection behaviors.

Environmental ethics determines a set of principles and standards that govern human relationships with nature and aim to prevent harm to nature and protect it. These principles create internal moral deterrents that seek to correct human misbehavior towards nature, resulting in the emergence of responsible environmental behaviors in individuals. Therefore, environmental ethics lead to the promotion of responsible environmental behaviors in individuals. One of the strengths of the present study was that no study has been conducted on the relationship between environmental ethics, spiritual health and environmental protection behaviors in Iran.

Limitations. The use of self-report questionnaires as a tool for collecting information can be seen as weak points in the present study, which should be cautious in generalizing the data. Another limitation of the present study was the lack of honest cooperation of the participants. To overcome this limitation, the study participants will be reminded that the questionnaire information will be completely confidential and the results will be presented in general. According to the results of the present study, it is suggested to carry out interventional studies to ensure, maintain and improve the mental health of students with an emphasis on environmental issues.

Conclusion. The findings of the present study suggest that spiritual health and environmental ethics are strong predictors of environmental behavior. In order to promote environmental protection behaviors in the future, it is necessary to focus not only on students' spiritual health but also on their ethical behavior and to employ solutions that enhance their ethical and spiritual behavior. It is possible to achieve desirable spiritual health and ethical behavior among students by considering the impact of these two variables on environmental behavior.

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