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40 años

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Challenges in Feeding Children with Autism Spectrum Disorder: the Role of Nurses in Research and Interventions

Editorial

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The prevalence of autism spectrum disorder (ASD) has increased significantly in every continent in the world. Research findings suggest that nearly 1 in every 100 children is diagnosed with ASD globally.[1] In the United States, more recent data from the Centers for Disease Control and Prevention (CDC) indicate an even higher prevalence, with 1 in every 36 children, or close to 2.0% being diagnosed with the disorder.[2] (Zeiddan et al., 2022; CDC, 2023). The prevalence distribution varies among different regions. In Latin American countries, like Brazil, data is limited, but it is estimated that approximately 1.5- to 2-million children could be affected by ASD. In Africa, prevalence rates are lower, with significant variations among countries due to differences in data collection methods and the diagnostics resources available.[3,4]

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In this regard, it has become quite common for nurses to provide health care to children with ASD and their respective families in the most diverse health services and territories. I would like to draw attention to nurses' challenges when implementing food and nutrition-based interventions and/or research in these cases. Initially, it is important for nurses to consider that these children may have problems, such as eating disorders. In case of feeding problems, in ASD, that refers to selective or avoidant feeding behaviors that do not involve cognitive concern with bodily image, weight, or shape. That is, selective eating can occur (picky eating can affect 91% of these children), along with refusal of food, avoidance of certain types of food, and idiosyncratic food preferences (such as insistence on certain foods or forms of presentation). In cases of eating disorders in ASD, it is possible to highlight persistent eating disturbances or food-related behaviors that negatively impact the individual's health or functioning, often associated with excessive concern about weight, shape, and bodily image.[5] Hence, nurses must face, above all, food selectivity, as a predictor or aggravating factor of problems in nutritional status from malnutrition to overweight. Both, impacting negatively on the child growth and development. Nursing interventions must also integrate the families of these children, given that family stress related with meals is overwhelming. Parents and caregivers of children with ASD frequently report difficulties in managing the child's feeding preferences and guarantee adequate nutrition. That stress can create a tense environment during meals, further harming the quality of food.[6] In addition, children with ASD are more prone to developing dysbiosis, a condition that can be exacerbated by poor diet, like excessive consumption of ultra-processed foods, which is on the rise throughout the world.[7]

In the academic field, nurses play a fundamental role in conducting research on nutrition, from topics like breastfeeding, enteral and parenteral nutrition, to research issues such as nutrition in children with ASD, especially in primary care.[3,8,9] However, they are likely to confront a number of obstacles. One of the principal challenges is the lack of instruments specifically validated to evaluate the feeding habits and behaviors of children with ASD. The majority of the questionnaires and scales available to study feeding habits do not take into account the peculiarities of said population, hindering the collection of accurate data.

Another important research niche that nurses need to unveil is the limited understanding of the relationship between family eating habits and the symptomatologic characteristics of ASD. Depending on the autism spectrum level, food can be an aggravating or alleviating factor for symptoms, and that is often neglected in academic studies.[10] In this case, the possibility exists of observational studies, mixed methods studies, and even qualitative studies. In the latter case, nurses can explore how dimensions of family health are impacted during this stressful process of feeding a child with ASD, researching aspects such as maternal burnout, support networks, and issues of food insecurity.

Nurses around the world can also be very successful when researching nursing diagnoses, such as those proposed by the North American Nursing Diagnosis Association (NANDA), in children with ASD. Especially those related to the class "Imbalanced Nutrition: Less Than Body Needs". Studies conducted with this focus, in clinical practice and in research centers, can elucidate the early prevalence of nursing diagnoses, such as "Risk of metabolism for unstable blood glucose level"; "Dynamics of ineffective child feeding", and "Risk of excess weight" in primary care services. This favors not only early interventions, but also damage reduction, health promotion actions, advocacy, and inclusion of the child-family binomial in the respective health services.[11]

Nurses inclined toward translational or clinical research may focus attention on how increased intake of ultra-processed foods affects ASD symptomatology and contributes to dysbiosis.

The answers to these questions can go beyond the clinical sphere, going against aspects directly linked to social health determinants, like food insecurity, public policies, and training the nursing staff on the topic of autism. Urging nurses to intervene and research the nutrition of children with ASD provides ammunition against the war that seeks to rob the future of this increasing number of children with ASD globally. With effort, nurses will be able to shed light on practical and scientifically based solutions for this scenario; going through the development of instruments, well-designed nursing diagnoses, and translational research.

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Practical Guide to Achieve Rigor and Data Integration in Mixed Methods Research

Methodological article

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Practical Guide to Achieve Rigor and Data Integration in Mixed Methods Research

Abstract

Mixed methods research represents a dynamic approach, that combines quantitative and qualitative perspectives in the same study to answer complex questions, beyond the reach of each method used separately. This type of research is increasingly used in health sciences and in social sciences, where it is possible to identify important contributions to knowledge and the practice, derived from the characteristic integration of this approach. Nevertheless, it important to reiterate the importance of recognizing their own perspectives, methods, rigor criteria, and challenges. This work presents general aspects of the epistemological perspective of mixed methods research, describes basic and advanced designs, forms and possible integration moments of each design, as well as the rigor criteria that guide these types of studies. Graphic elements are presented to facilitate recognizing the structure of each design. Furthermore, a visual tool is introduced denominated "anatomy of mixed methods research", which seeks to guide researchers regarding each of the key elements in the design and development of this type of research.

Descriptors: qualitative research, data analysis, nursing research.

Guía práctica para alcanzar el rigor y la integración de datos en la investigación de métodos mixtos

Resumen

La investigación de métodos mixtos representa un enfoque dinámico, que combina la perspectiva cuantitativa y cualitativa en un mismo estudio, para dar respuesta a preguntas complejas, más allá del alcance de cada método utilizado de forma separada. Este tipo de investigación es cada vez más usada en las ciencias de la salud y en las ciencias sociales, donde se pueden identificar importantes aportes al conocimiento y la práctica, derivadas de la integración propia de este enfoque. Sin embargo, es importante reiterar la importancia de reconocer sus propias

perspectivas, métodos, criterios de rigor y desafíos. Es así, como en este artículo se presentan aspectos generales de la perspectiva epistemológica de la investigación de métodos mixtos, se describen los diseños básicos y avanzados, las formas y posibles momentos de integración de cada diseño, así como los criterios de rigor que orientan este tipo de estudios. Se presentan elementos gráficos que facilitan el reconocimiento de la estructura de cada diseño. Adicionalmente, se presenta una herramienta visual denominada "anatomía de la investigación de métodos mixtos", la cual busca orientar a los investigadores frente a cada uno de los elementos clave en el diseño y desarrollo de una investigación de este tipo.

Descriptores: investigación cualitativa, análisis de datos, investigación en enfermería.

Guia prática para alcançar o rigor e a integração de dados na pesquisa de métodos mistos

Resumo

A pesquisa de métodos mistos representa uma abordagem dinâmica que combina a perspectiva quantitativa e qualitativa no mesmo estudo, para responder questões complexas, além do escopo de cada método utilizado separadamente. Este tipo de investigação é cada vez mais utilizada nas ciências da saúde e nas ciências sociais, onde podem ser identificadas importantes contribuições para o conhecimento e a prática, derivadas da integração desta abordagem. Portanto, é importante reiterar a importância de reconhecer as suas próprias perspectivas, métodos, critérios de rigor e desafios. Assim, este artigo apresenta aspectos gerais da perspectiva epistemológica da investigação de métodos mistos, descreve os desenhos básicos e avançados, as formas e momentos possíveis de integração de cada desenho, bem como os critérios de rigor que norteiam este tipo de estudos. São apresentados elementos gráficos que facilitam o reconhecimento da estrutura de cada desenho. Além disso, é apresentada uma ferramenta visual chamada "anatomia da pesquisa de métodos mistos", que busca orientar os pesquisadores sobre cada um dos elementos-chave no design e desenvolvimento de uma pesquisa deste tipo.

Descritores: pesquisa qualitativa, análise de dados, pesquisa em enfermagem.

Introduction

Mixed methods research has undergone important development in recent decades. Its use is increasingly more frequent in social sciences and in health sciences due to a growing number of publications guiding its development not only from the methodological point of view, but also epistemological. This type of research represents a dynamic approach of knowledge that permits generating contributions to theory and practice, from recognizing multiple points of view from qualitative and quantitative perspectives.[1] Currently, using mixed methods research in the nursing discipline is not considered innovative or controversial,[2] however, important challenges exist to advance in its maximum potential and in enhancing the rigor required by this type of research. Nursing publications derived from mixed methods research have increased, although to a lesser extent compared with other disciplines, like psychology and education. Younas *et al.,*[3] presented a literature review on publications of mixed methods research in nursing, calculating a prevalence of 1.89% between 2014 and 2018. Nevertheless, the authors identified the need to strengthen aspects related with rigor and the importance of broadening forms of integration.

An aspect of great importance to advance in the development and application of mixed methods research in nursing is its differentiation from multimethod or multiple methods research. The latter refers to diverse combinations of methods that include more than one data collection procedure. It can include two or more exclusively qualitative approaches, two or more quantitative approaches or a combination of qualitative and quantitative approaches.[4] It is also necessary to highlight that, although the term triangulation has been related with mixed methods research, currently its use is not recommended in this context, given that the term integration is broader and more coherent with this type of research.[4]

Unlike research with multiple methods, mixed methods research is characterized for combining elements from qualitative and quantitative research to achieve more profound understanding of a phenomenon, than what would be possible using each method separately.[4] It is one of its greatest strengths and, in turn, a guiding aspect when defining and justifying its use. In this sense, it is worth mentioning that in mixed methods research quantitative and qualitative objectives must be established and that, moreover, a clear intentionality must be present in the integration of these types of studies, given that it constitutes the essential component of mixed methods research and it refers to the mixture, fusion, or comparison of qualitative and quantitative findings during data collection, analysis and interpretation.[5] This is how integrating quantitative and qualitative data is a central and intentional activity, which can be present at the level of conceptualization,

operationalization of design, methods, analysis, interpretation and reporting of findings.[5]

It is important to consider that other aspects exist that turn out essential within mixed methods research, such as:[5] 1) a clear justification to address the problem and the questions through this type of research, 2) the clear definition of a mixed method design, 3) the detailed description of the sampling procedures, collection and analysis of both qualitative and quantitative data, 4) description of the integration process including moments and strategies, 5) evidence of the integration, and 6) description and explanation of the meta-inferences, as well as the knowledge generated by the integration. Within these types of studies, it is also greatly important to describe the researchers' skills in quantitative, qualitative, and mixed research, as well as to represent the design with a graphic scheme that clearly indicates the point or points of integration.[6] These aspects are essential in methodological terms and define, largely, the quality and legitimacy of this type of design, adding to the importance of using a theoretical framework within an epistemological perspective, which defines its scope and purpose.

Epistemological perspective of mixed methods research.

The research process, independent of its approach, is supported on an epistemological posture that guides its vision of reality and the methods of relating with the object of knowledge. In mixed methods research, the epistemological perspective acquires especial relevance, given that its principal characteristic is the qualitative and quantitative data integration within the same study.[7] Thus, mixed methods research requires a clear epistemological posture by researchers to promote a reflexive and coherent process throughout the entire research process.

Traditionally, the positivist paradigm and interpretative paradigm have proposed a methodological dichotomy aimed at quantitative or qualitative research.[8] Thereby, integration in mixed methods research has generated debate and tensions. From a paradigmatic point of view, quantitative research implies a vision of an objective and quantifiable reality, a position by researchers outside this reality and neutrality as one of the principal characteristics of the positivist paradigm. On the other hand, qualitative research supposes a non-quantifiable subjective reality, typical of human experience, where researchers interact with that reality and involve their values through reflexibility, as proposed by the interpretative paradigm.[8] Mixed methods research, in turn, recognizes that a phenomenon may be studied from both approaches and that the results may be complemented from the individual perspective of each paradigm.[7] This is how the epistemological foundation of mixed methods designs lies, to a large extent, in pragmatism, where, from a reason of complementarity, perspectives join in the production of knowledge to broaden comprehension of a phenomenon.[9]

The complexity of mixed methods research requires profound comprehension of the assumptions and philosophical positions. In this regard, Onwuegbuzie and Corrigan[10] propose a three-dimensional model to categorize and organize these assumptions: *dimension 1* refers to the point at which assumptions and philosophical positions emerge. In mixed methods research, an *a priori* or *a posteriori* philosophical framework can be used. Nonetheless, an intermediate point exists where philosophical frameworks emerge iteratively, that is, a researcher can begin with a philosophical framework that evolves as research is conceptualized and planned;[10] *dimension 2* contains the assumptions and philosophical positions that underlie the study. At one end are research philosophies that emerge from the tradition of quantitative or qualitative research and at the other end are the research philosophies developed specifically for studies of mixed methods research. Among them, the following have been described: pragmatism, critical realism, dialectics, complementary strengths, the substantive theory,

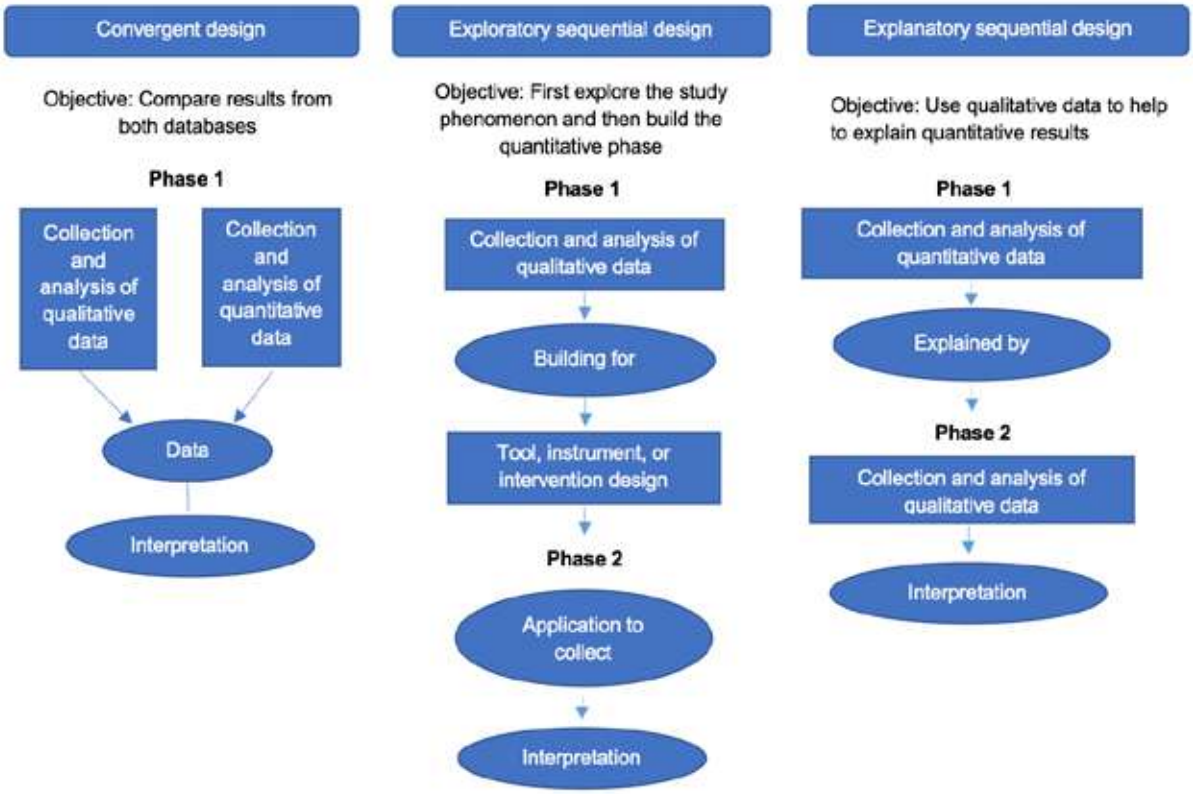
dialectic pluralism, and critical dialectic pluralism, among others.[10] And, finally, *dimension 3* that establishes the number of philosophies involved in mixed methods research. In one end are studies that do not consider any philosophy explicitly, *i.e.*, they have an a-paradigmatic stance, and in the other end are studies that involve multiple philosophies and which are compatible with pluralist dialectic postures.[10]

Research based on mixed methods may be placed in any part of the three dimensions, which demonstrates that research philosophies can be mixed or integrated in different ways, thereby, it is necessary to make explicit the way in which they are involved and articulated within the study.[10] This aspect represents a demonstration of the great potential and possibilities of establishing dialogues of perspectives and generating contributions in different areas and disciplines of knowledge. In this sense, it is worth highlighting critical dialectic pluralism as a stance that favors culturally progressive, responsive, and engaged research that promotes social justice, inclusion, diversity, equity, and social responsibility.[10,11] This lens for viewing the reality of research promotes, at the same time, rigorous and ethical research, as it guides methodological decisions responsibly to guarantee the well-being of participants and rigor in the different designs of mixed methods research.[10,11]

This perspective reaffirms the possibilities of mixed methods research to develop knowledge in the nursing discipline. The epistemological postures characteristic of mixed methods are consistent with the disciplinary philosophical perspective of nursing.[2] It is important to recognize that nursing knowledge emerges from the integration of different forms of knowledge, from ethical, empirical, and sociopolitical dimensions. Research paradigms imply a way of seeing, interpreting, analyzing, and addressing research phenomena. Hence, quality and rigor have a close relationship with the epistemological perspective. Mixed methods research is based on integration; thus, it must assume a logical philosophical position coherent with this perspective, which allows a critical, reflexive, ethical, and rigorous research process.

Mixed methods designs and data integration.

The three principal or basic mixed methods designs (Figure 1) are already well-defined in the literature. To summarize, here are each of them in function of their main objective: 1) explanatory sequential: that uses qualitative data to explain part of the quantitative results, 2) exploratory sequential: where, first, the study phenomenon is explored and, then, the quantitative phase is constructed, and 3) convergent design: where the objective is to compare the results of both phases, where there can be convergences, divergences, and expansion of the results to respond to the issue of mixed methods research.[5]



Source: Adapted from Creswell JW, Plano-Clark VL. Designing and conducting mixed methods research (3rd ed.). Thousand Oaks, CA: Sage 2017

Figure 1. Structure of the principal designs in mixed methods research

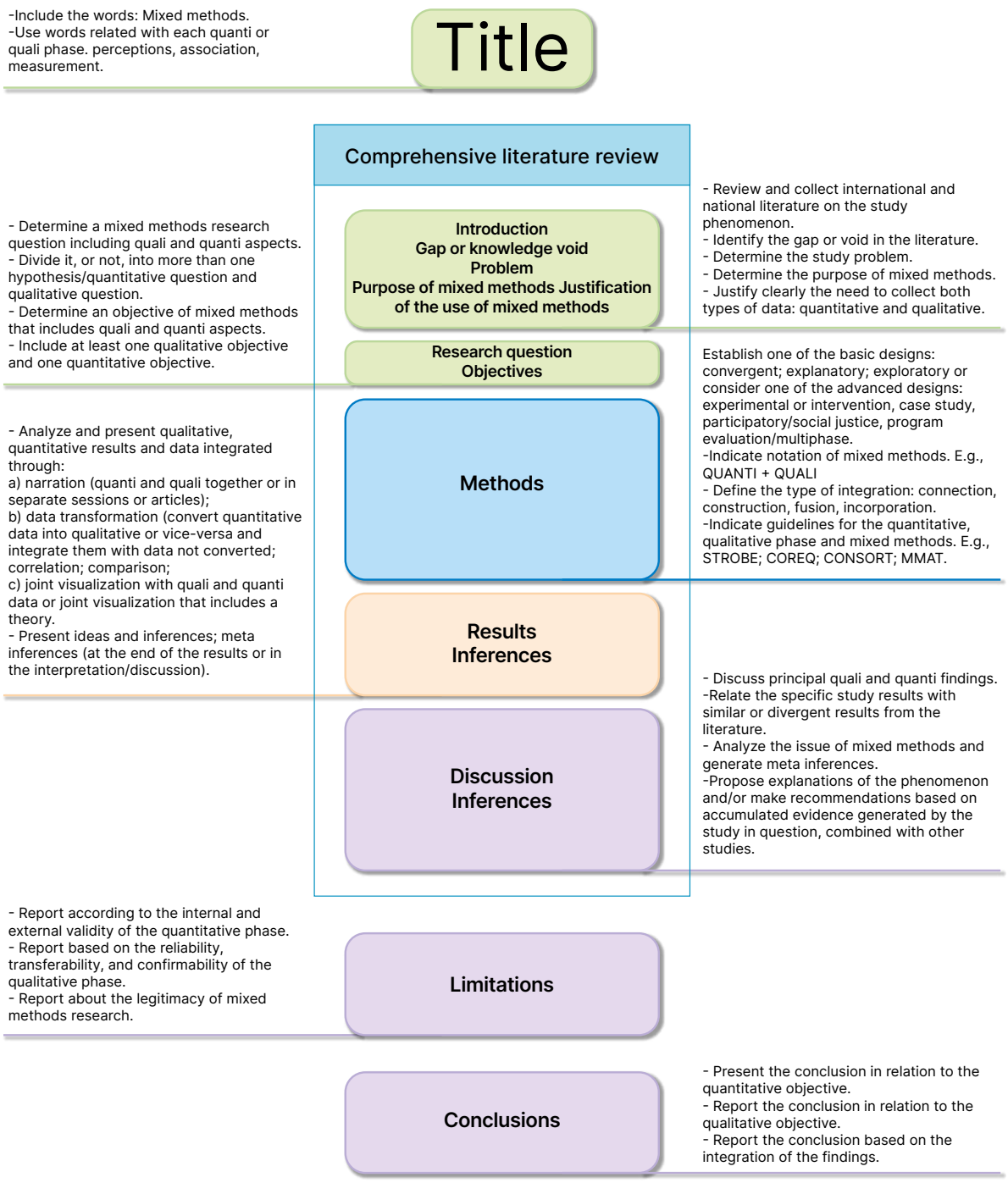
Besides the basic designs: convergent, explanatory, exploratory, advanced designs exist: 1) experimental or intervention, 2) case study, 3) participatory: social justice design, and 4) program evaluation/multiphase.[5] With relation to integration, it is worth noting that it can occur in the design, the method, and in the presentation and interpretation of results. With respect to the type of integration in the method, researchers must indicate the type of mixed methods used, for example: QUANTI + QUALI and specify the type of integration that will be applied to both databases: connection, construction, fusion, or incorporation.[12]

Regarding the type of integration in the results presentation and interpretation, it is possible analyze and present qualitative and quantitative results integrated by: *(a) Narrative*: qualitative and quantitative results together or in separate sessions and an article from the complete study of mixed design; this design was used in the study by Neves *et al.*;[13] *(b) Data transformation*: convert qualitative data into quantitative or vice-versa and integrate them with data not converted in correlation and comparison terms. For example, in the study by Lorenzini *et al.,*[14] a database was integrated with another through the sample of participants in a quantitative and qualitative phase, through a validated questionnaire and the completion of open questions, intentionally

designed to answer complex questions, within the framework of a convergent design. Additionally, after the qualitative analysis and generation of categories, data were transformed to establish quantitative variables, which were then object of descriptive and inferential analysis; and (c) *Joint display* of qualitative and quantitative data or joint display that includes a theory.[5,12] In this design, presenting "*insights"*, inferences, and meta inferences at the end of the results or in the interpretation broadens the discussion. An example of this design is presented in the study by Lorenzini *et al*.[15]

Application of integration principles and practices can promote the use of the strengths of mixed methods. It is quite important to understand that different forms of integration qualify the mixed study and can occur at different moments of the study. Thereby, to demonstrate the integration, it is paramount to discuss the principal quantitative and qualitative findings while the specific study results are related with similar or divergent results in the literature. Further, it is necessary to analyze the issue of mixed methods research and generate meta inferences to, finally, propose explanations for the study phenomenon and formulate recommendations based on the accumulated evidence generated by the study in question, combined with other evidence from the literature.

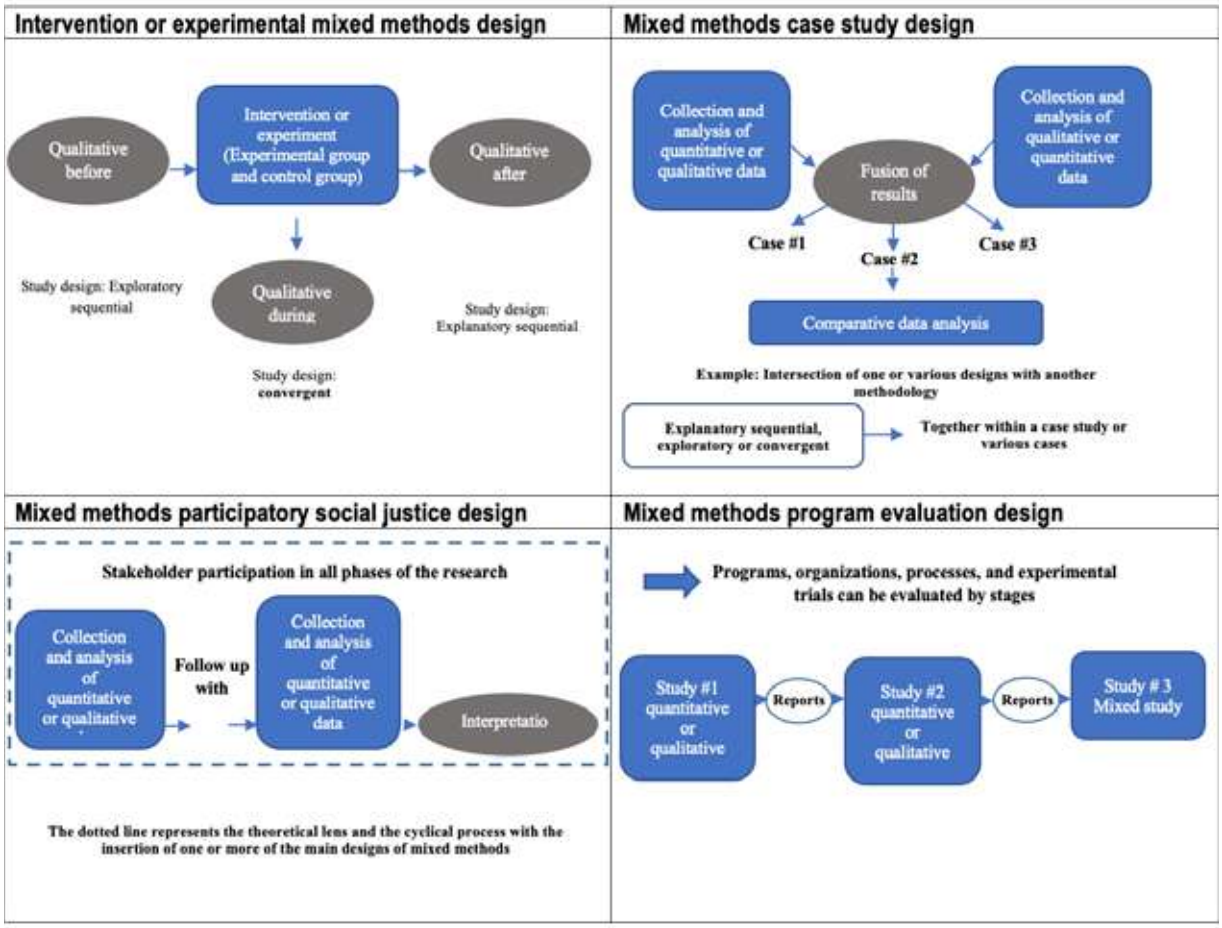
Figure 2 presents the tool called "Anatomy of mixed methods research" developed by Professor Elisiane Lorenzini from Universidade Federal de Santa Catarina in Brazil. Using this tool can facilitate identifying each of the stages of mixed methods research and recognizing visually the minimum elements expected in the project description and in the research report.



Source: Elisiane Lorenzini, Universidade Federal de Santa Catarina, Brazil.

Figure 2. Anatomy of mixed methods research

Although convergent, explanatory sequential, and exploratory sequential designs are called basic, they are complex in themselves; the continuous evolution of mixed methods research has allowed developing and presenting new designs. According to Creswell and Plano-Clark,[16] four types exist denominated Advanced Mixed Methods Designs, which are shown in diagrams in Figure 3 with a brief description, besides examples of the application of each.



Source: Adapted from Creswell JW, Plano-Clark VL. Designing and conducting mixed methods research (3rd ed.). Thousand Oaks, CA: Sage 2017.

Figure 3. Structure of advanced mixed methods designs

Experimental or intervention mixed methods design

In this design, a quantitative experimental or intervention study was conducted and the collection and analysis of qualitative data was carried out within the framework of a qualitative study. The collection stage of qualitative data can take place in one or more moments during the planning and execution of the intervention; that is, it can occur before, during, or after the intervention, or at all moments. An example of this type of research can be consulted in the study by Jafarpour.[17]

Given the rigor inherent to both research approaches, some procedures must be considered:[5] 1) determine how the qualitative data will be used in the experiment; 2) determine why the qualitative information is necessary and how it will be used; 3) identify when qualitative data will be collected (before, during, or after the intervention) or during the three phases; 4) conduct the experiment/intervention of the quantitative stage; 5) specify the conceptual model that guides the design; 6) assign participants to the treatment group and to the control group; implement the treatment/intervention proposed; 7) measure variables and results; 8) analyze quantitative data using descriptive and inferential statistics to respond to the quantitative hypothesis; 9) collect and analyze qualitative data if planning to collect them during the experiment to answer questions of qualitative research; 10) perform procedures to integrate quantitative and qualitative data based on the reasons to include qualitative data in an intervention or experimental study; 11) determine how the results improved the experiment, being careful not to interfere in the effectiveness of the intervention carried out; 12) present specific inferences from the use of qualitative results; 13) interpret and reflect about how the qualitative results helped to improve the experiment or, for example, in a randomized clinical trial (RCT). Therefore, the emphasis is on the need to maintain the rigor of each of the designs that are part of a mixed methods research. For the RCTs, the declaration of Consolidated Standards of Reporting Trials (CONSORT) and its extensions propose the critical points that these types of studies must include and which are essential to determine the efficacy or effectiveness of interventions within the framework of a mixed design. This is how these types of studies in their experimental component must be guided by the criteria of this declaration.[18]

These types of advanced designs are related with the basic designs. When researchers decide that qualitative data will be collected prior to the intervention, the basic or principal design used will be exploratory sequential.[5] Some examples about the reasons for collecting qualitative data before the quantitative or intervention stage can be the need to develop a questionnaire for its subsequent application or to identify pre- and post-trial measures of interest, identify possible participants for rare case studies, understand the context and setting where the trial will be implemented, or to document the need for the intervention. When researchers decide that qualitative data will be collected during the intervention, the basic or principal design used will be convergent.[5] Some examples that can explain the need to collect during the implementation of the intervention include the importance of understanding the experience of participants about the intervention proposed, identifying possible mediating or moderating factors, understanding participants' experience of facilitators and barriers during the implementation of the intervention, identifying resources that can affect the implementation of the intervention, accessing or verifying the fidelity of the intervention's procedures.

A third possibility exists and it is that researchers decide to collect qualitative data after the intervention. In this case, the basic or principal design used will be explanatory sequential.[5] Some examples of why data collection may be necessary after implementing the intervention, include the need to understand why the results

occurred, receive feedback from participants, revise or change the intervention, help to explain some variations in the results, examine the sustainability of the effects of the intervention over time, help to explain the mechanisms that may have operated during the trial, or test how the context may have influenced on the results. It is worth noting that in research using mixed intervention methods, researchers must determine at which point will the integration occur or if it will occur in all stages, based on the question of qualitative research to explore. Thereby, the quality of the qualitative study will add value to the study as a whole.

Mixed Methods Case Study Design

Mixed designs imply using a basic design (convergent, explanatory sequential, exploratory sequential) within the framework of a case study that can be single or multiple. This design collects both quantitative and qualitative data and the final product is the generation of one or various detailed cases and contextualized beyond a case that contains only quantitative or qualitative data.[5] Frequently, both types of data are collected simultaneously in a convergent design and, after that, the results are fused, where integration takes place. Comparative analysis of cases is added to this, which constitutes a space for data integration. Some advantages commonly associated with case studies are the possibility of developing profound understanding and practical, individualized and transferable conclusions. In addition, they allow comprehending the complexity of a case, comparing cases from the qualitative and quantitative dimension to represent their variations and knowledge.

This type of design requires prior experience in procedures related with case studies and with qualitative studies, which lead to selecting the adequate design and defining a single or multiple case. An example of a mixed methods case study conducted by Poth *et al.,*[19] can be reviewed to broaden understanding of this design. This study sought to assess the impact of competency-based programs in training evaluators in medical education. This design was appropriate due to the need to capture the complexity of the many facets that contribute to an effective learning environment for evaluators. The case was limited by the duration of the course and its participants to generate comprehensive understanding of the experience by the students. The results provided empirical evidence about the impact of these types of training programs and the comparative analysis of effective performance to train evaluators at graduate level. The study indicated the need to understand who the students are and how to facilitate significant interactions among those involved in the course, among other aspects.

Mixed Methods Participatory - Social Justice Design

This involves developing a central design within a theoretical framework or conceptual participatory and/or social justice framework, such as – for example – a feminist or participatory theory.[5] First, quantitative and qualitative data are collected and analyzed in separate studies. Thereafter, the results are interpreted, wherein integration is produced. In this type of study, ideally, the principal researcher must have extensive knowledge of the theory that illuminates the study as a whole. The main objective is to empower participants to generate needed changes with respect to their own problems identified with the aid from researchers during the study. One of the strengths that can be highlighted from this design is that it permits articulating any basic or principal design with a mixed methods participatory social justice design.[5] The study by Greysen[20] is an example in which it can be identified that it started with participation from interested parties by collecting data via interviews and focal groups. Another example is the study by NeMoyer[21] who began the research as of the data from a survey, during a quantitative stage, followed by other stages that included collecting qualitative and quantitative data in a multiphase design.

Another strength of these types of designs is that they can be more easily accepted among groups of interested parties, as researchers help to generate changes in practice and to promote empowerment based on results useful to participants, communities, and those responsible for public policies.[5] One of the principal challenges in this design is the need for researchers to be experienced in identifying the theoretical frameworks and previously familiarized with them, and who have the ability to communicate the framework to the participants to implement it throughout the study (formulation of the problem, results collection, analysis, and interpretation). In this same sense, researchers face the challenge of developing trust with the participants, foster in them the desire to change, which is necessary for the participatory methodology, besides having sufficient skills and sensitivity to conduct research while respecting the culture.[5]

Mixed Methods Program Evaluation Design

It is a design that includes one or more central designs added to the evaluation of an intervention or a program during a period of time, with hopes of guiding its development, enhancement, or adaptation.[5] These studies can be multiphase, for example, they can include collecting and analyzing qualitative and quantitative data in separate studies. Thus, these prior studies could support a third study, for example, involving one or more of the principal designs in the phases of an evaluation procedure. These research normally center on assessing the success of a program, process, activity, or intervention.[5] The strengths of this design include the flexibility to employ any element of mixed methods to answer interconnected research questions, ability to publish results from individual studies while still contributing to the broader study, and ability to build a framework to conduct multiple iterative studies over several years. In addition, it can provide multiple results for diverse objectives, such as, for example, evidence about the practices. [5]

With respect to the challenges of this design, one of the main ones is to meaningfully connect individual studies, combined with the principal designs of mixed methods and other studies, as well as to establish the dynamics of the research team and maintain it.[5] Other challenges imply involving the participants, managing resources, making more than one presentation to the Research Ethics Committee, as well as translating the knowledge to apply it in the practice.[22]

As seen, principal designs alone or in their intersection with complex frameworks, which account for the methodological rigor inherent to each method, can represent mixed methods studies of high scientific value. Regarding the design, it must be mentioned that an interesting perspective has been described, which classifies designs as typological, where basic and complex designs described are found, as well as the interactive or dynamic designs.[5,23] In these last ones, the design is understood as a continuous, interactive, and complex process that demands researchers continuous comparison of the components during the research development, to verify that they adapt to each other or, if necessary, re-establish or adjust them.[23] In all cases, describing a type of design within mixed methods research is a central aspect, hence, it must be clearly detailed and articulated coherently with the mixed nature of the research problem, questions, and study objectives.

Rigor in mixed methods research

A starting point that permits addressing the perspective of rigor within the mixed method is to emphasize the need to maintain rigor in each of its components as an aspect that underpins the integration and complementarity of the method.[24] Nevertheless, if the components are not evaluated as a whole, the study will not provide an analysis of the rigor from the integration characteristic of the mixed perspective. Currently, widely disseminated tools exist that guide the assessment of the quality of mixed methods

research; the best known of these is the Mixed Methods Appraisal Tool, which evaluates five categories:[25] 1) justification of adopting mixed methods; 2) integration between quantitative and qualitative components; 3) interpretation of the integration between quantitative and qualitative data; 4) presentation of divergences between quantitative and qualitative results; and 5) compliance of the methodological rigor of each research approach. This tool has been adapted and validated in different contexts and languages and serves as a guide that largely oversees the quality of research under this approach.[26]

It is worth mentioning that it is useful to consider checklists or specific tools to assess methodological quality to verify the rigor criteria of the qualitative and quantitative components, according to the methodological design of each. However, these tools by themselves do not reflect the rigor of mixed method research where the study needs to be valued as a whole. In this sense, it is important to highlight that research rigor implies profound comprehension of the concepts that define it and the strategies that contribute to its enhancement, recognizing the challenge this type of research entails by combining philosophical paradigms and a great diversity of methodologies. Given the perspective of complementarity, the rigor of one component directly affects the quality of the other and can, ultimately, affect the results and legitimacy of the meta-inferences – understood as the inferences made from the qualitative and quantitative findings integrated in mixed methods research.[24]

Lincoln and Guba[27] developed concepts that have helped to define the criteria to judge qualitative and quantitative research from a perspective coherent to each approach. In this same line, Koch[28] proposed an equivalence in the dimensions from which rigor criteria can be established in qualitative and quantitative research, from the principles that guarantee the quality of the studies. This is how methodological rigor can be expressed in both approaches from: the *value of truth*, *applicability*, *consistency*, and *neutrality.*

In turn, in mixed methods research, the dimensions of quality as a whole are complex, but widely accepted perspectives exist with clear connections with the general criteria of research quality. Two dimensions exist of great importance within the rigor of mixed methods research, according to Eckhardt and DeVon[24], these are: (i) *quality of the inference,* determined by the quality of the design and by the interpretative rigor; this last aspect refers to the degree to which the interpretations of the data are derived directly from the results obtained and is characterized by the interpretative consistency, theoretical consistency, interpretative agreement, interpretative distinction, and integrative effectiveness;[24] and, (ii) *Legitimation* that refers to the researcher's capacity to make credible, reliable, and confirmable inferences.[24,29] Legitimation has to do with aspects, like the sample and the sampling, the degree to which the subjects' point of view is presented, minimization of the weaknesses of each method, the paradigmatic mix, commensurability, defined as a third point of view that extends beyond the qualitative or quantitative points of view by themselves, among others.[22,27] Legitimation is central aspect of the quality of mixed methods research, it is not centered on evaluating the qualitative or quantitative methods, but on a joint vision of quality. In terms of quality and the rigor of mixed methods research, highly important perspectives have also been described, like the *validation framework* and the *quality framework*.[30,31]

The *validation framework* includes traditional rigor elements, like validity, reliability, and credibility, as well as other aspects, such as the researchers' prior knowledge about the concept of interest and the inferential consistency, which refers to whether the conclusions drawn are appropriate given the study's methodological options. The validation framework should be used as research is planned and carried out to ensure the quality of the data and inferences.[30] Within

this framework, collaborative work in research teams highlights a special importance as an element that favors the quality of mixed methods. This type of research is strengthened by a team of researchers with diverse backgrounds and strengths in quantitative, qualitative, and mixed research in which each member contributes from their experience to promote the rigor, respecting the contribution by each method.[22]

Lastly, the *quality framework*[31], proposes as its center, the quality of the inference based on domains, such as the quality of planning, design quality, data quality, interpretative rigor, transferability of the inference, quality of the reports, capacity for synthesis, and utility. These frameworks or dimensions of the quality of mixed methods research are coherent with each other and reaffirm the need to understand the research quality and rigor from each method and as a whole. Applying tools and checklists facilitates assessing quality, but its foundation lies in understanding the dimensions of rigor, its expression, and strategies to favor it. Table 1 presents the rigor criteria according to each research approach, as well as some of the strategies that promote them. It is identified that the rigor perspectives of mixed methods research connect with traditional rigor dimensions and that aspects related with integration become a central element of the quality of mixed methods research.

Table 1. Strategies to favor rigor according to type of research

Rigor criteria	Qualitative research	Quantitative research		Mixed methods research
Value of truth	**Credibility** Use of synthesis and repetition, textual transcriptions, triangulation techniques during interviews by researchers, validation of results findings with participants.	**Internal validity** Control of confounding and selection biases. Clear definition of inclusion and exclusion criteria.	⬅	**Quality of the inference** Justification of the use of the design and coherence with the research question and objective. Clarity and fidelity of the type of mixed design used and explicit definition of the type and moment of integration. Clarity with respect to the variables and decisions regarding their integration in the qualitative component.
Applicability	**Transferability** Theoretical sampling, Detailed archive of audios, transcripts, memos, matrices, and diagrams. Constant comparison of data and contrast with the literature. Description of the context and the characteristics of the participants.	**External validity** Sampling strategies and calculation of sample size.	⬅	**Legitimation** Definition of the type of samples (independent or inter-dependent) and the type of sampling in each component. Sampling calculation. Detailed methods to obtain and analyze data, visibility of participants' voices. Description and evidence of the integration process.

Table 1. Strategies to favor rigor according to type of research (Cont.)

Rigor criteria	Qualitative research	Quantitative research		Mixed methods research
Consistency	**Reliance** Triangulation. Researcher's reflexibility in the process.	**Reliability** Use of questionnaires and instruments guided by the objectives. Use of validated and reliable instruments to apply in the context.	⬅	**Validation framework** Validity, reliability, applicability. Researchers' prior experience and track record, inferences consistent and coherent with methods and data.
Neutrality	**Confirmability** Textual transcription of the interviews, application of confirmation and synthesis techniques during the interviews. Triangulation by researchers.	**Objectivity** Application of questionnaires through self-completion and in opportune spaces and moments. Masking in experimental studies.	⬅	**Quality framework** Justification of the use of the design and coherence with the research question and objective. Clarity and fidelity of the type of mixed design. Explicit definition of the form and location of the integration.

Finally, it may be concluded that mixed methods research enables the dialogue of perspectives, from the complementarity of the various methodologies, both quantitative and qualitative, to respond to complex questions, beyond the reach of using each type of research separately. This allows contributing to the generation of dynamic scientific knowledge sensitive to the social and cultural contexts in which the research process takes place. In this regard, it is fitting to recognize that this type of research implies great complexity derived from the integration and generation of meta inferences. Thus, among the main challenges, the clarity and pertinence of its theoretical and epistemological support and the rigor in each of the quantitative, qualitative and mixed methods as a whole stand out. The aspects presented seek to provide practical elements that facilitate the process and guide the development of these types of studies.

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Effect of patient sorting done by nurses on care request management in primary care emergency services

Original Article

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Effect of patient sorting done by nurses on care request management in primary care emergency services

Abstract

Objective. To determine the influence of patient sorting done by nurses in primary care emergency services on care priorities and discharge referrals, both in general and in relation to the reasons for consultation. **Methods.** Descriptive retrospective study. Variables were compared before and after the involvement of nurses in sorting patients in the primary care emergency services of the Granada Health District (Andalusia, Spain). 41,295 records were analyzed, 18,663 before and 22,632 two years after the inclusion of nurses. The reasons for consultation, priority levels, and types of discharge referral during the two study moments were compared. **Results.** Regarding the reasons for consultation, it was observed that the percentages of malaise ($p<0.001$) and diseases of the genitourinary system ($p<0.001$) increased, while fever ($p<0.001$), among others, decreased. In the two-year measurement period after sorting done by nurses was implemented, type IV priorities increased in percentage ($p<0.001$) and type V priorities decreased ($p<0.001$). Discharges to home decreased ($p<0.001$), while family physician referrals increased ($p<0.001$). **Conclusion.** The participation of nurses in the sorting of patients in primary care emergency services was related to significant changes in priority assignment, discharge referrals, and management of the reasons for consultation, showing an improvement in patient care autonomy and in the resolution of minor clinical problems in the emergency room.

Descriptors: triage; emergency nursing; advanced practice nursing; community health nursing; primary health care.

Influencia de la clasificación de pacientes realizada por la enfermera sobre la gestión de la demanda en los Servicios de Urgencias de Atención Primaria

Resumen

Objetivo. Determinar la influencia de la enfermera en la clasificación de pacientes de los Servicios de Urgencias de Atención Primaria sobre las prioridades de atención y las derivaciones al alta de manera general y en relación con los motivos de consulta. **Métodos.** Estudio descriptivo retrospectivo. Se compararon las variables antes y después de la inclusión de la enfermera en la clasificación de pacientes de los Servicios de Urgencias de Atención Primaria de la Zona básica de Salud de Granada (Andalucía, España). Se analizaron 41.295 registros, 18.663 antes y 22.632 dos años después de la implementación de la medida. Se compararon los motivos de consulta, niveles de prioridad y derivación al alta en los dos momentos de estudio. **Resultados** En cuanto a los motivos de consulta se pudo observar que, aumentaron los porcentajes de malestar general ($p<0.001$) y enfermedades genito-urinarias

(*p<0.001*), y disminuyeron, entre otras, la fiebre (*p*<0.001). En la medición de dos años después de implementada la clasificación por enfermería se incrementaron porcentualmente las prioridades IV (*p*<0.001) y descendieron las prioridades V (*p*<0.001). Las derivaciones al alta al domicilio disminuyeron (*p*<0.001), aumentaron al médico de familia (*p*<0.001). **Conclusión** La participación de la enfermera en la clasificación de pacientes en los Servicios de Urgencias de Atención Primaria se relacionó con cambios significativos en la asignación de las prioridades, las derivaciones al alta, y la gestión de los motivos de consulta evidenciando mejoría en la autonomía de la atención al paciente y en la resolución de problemas clínicos leves de las urgencias.

Descriptores: triaje; enfermería de urgencia; enfermería de práctica avanzada; enfermería de salud comunitaria; atención primaria de salud.

Influência da classificação dos pacientes realizada pelo enfermeiro no gerenciamento da demanda nos Serviços de Urgência da Atenção Básica

Resumo

Objetivo. Determinar a influência do enfermeiro na classificação dos pacientes dos Serviços de Urgência da Atenção Básica nas prioridades de atendimento e encaminhamentos de alta em geral e em relação aos motivos da consulta. **Métodos.** Estudo descritivo retrospectivo. As variáveis foram comparadas antes e depois da inclusão do enfermeiro na classificação dos pacientes nos Serviços de Urgência de Atenção Primária da Zona Básica de Saúde de Granada (Andaluzia, Espanha). Foram analisados 41.295 registros, 18.663 antes e 22.632 dois anos depois da implementação da medida. Os motivos da consulta, níveis de prioridade e encaminhamento de alta foram comparados nos dois momentos do estudo. **Resultados** Quanto aos motivos da consulta, observou-se que os percentuais de mal-estar geral (*p*< 0.001) e doenças geniturinárias (*p*< *0.001*) aumentaram e a febre, entre outras, diminuiu (*p*< 0.001). Na medição dois anos após a implementação da classificação de enfermagem, as prioridades VI aumentaram percentualmente (*p*< 0.001) e as prioridades V diminuíram (*p*< 0.001). Os encaminhamentos no momento da alta para o domicílio diminuíram (*p*< 0.001) e aumentaram para o médico de família (*p*< 0.001). **Conclusão** A participação do enfermeiro na classificação dos pacientes nos Pronto Socorros da Atenção Básica esteve relacionada a mudanças significativas na atribuição de prioridades, encaminhamentos para alta e gerenciamento dos motivos de consulta, evidenciando melhora na autonomia do atendimento ao paciente e a resolução de problemas clínicos menores em emergências

Descritores: triagem; enfermagem em emergência; prática avançada de enfermagem; enfermagem em saúde comunitária; atenção primária à saúde.

Introduction

The increase in emergency care requests by the population is a well-known fact.[1] In the year 2022 alone, a 30% increase in the number of people that received emergency care in Spain was estimated with respect to the year 2021.[2] One of the main reasons for this increase has been the rise in the expectations of the population. Users expect to be treated for any alteration in their state of health almost immediately, and to this end a great amount of resources is required.[1] Previous studies suggest that the population with primary care (PC) difficulties go to the emergency deparment (ED) for this type of care and that between 10% and 60% of the patients in the emergency room could be treated in less urgent care services.[3-5]

Another factor contributing to the overcrowding of ED is the change in the profile of users. There has been an increase in the age of treated people, an increase in chronicity, complexity, frailty, and comorbidity, which leads to an increase in complications and adverse reactions to medications.[3-6] This change in user profile has meant that emergency care, traditionally focused only on the clinical process, has had to adopt a social and family perspective.[6] Therefore, emergency rooms must make organizational changes to improve the quality and efficiency of care and to adapt it to the users' profile.

In recent years, initiatives have been developed to strengthen triage, create new care areas, and modify emergency work processes, which have had positive results, although limited to hospital emergency rooms.[7,8] In Andalusia (Spain), a model of emergency care based on integrated and continuous care was adopted, consisting of the hospitals' emergency services and those of PC centers, as well as the 061 Health Emergency Center.[9] The Primary Care Emergency Departments (PCED) are located in centers that provide care to the reference population during the closing hours of PC centers (evenings and nights from Monday to Friday, Saturdays, Sundays, and holidays). These services also have mobile teams that provide urgent/emergency care 24 hours a day, providing assisted transfers to referral hospitals when necessary.

To guarantee citizens' access to the service and to organize healthcare, the PCEDs have incorporated tools such as patient sorting systems at the fixed locations, referral criteria, time-dependent integrated care processes, and clinical process protocols.[10] In addition, as of 2018, nurses with an advanced practice competency profile (APN)[6,11] were incorporated following the competencies recognized for this role in Andalusia.[6,12] Specifically, advanced APNs in nursing consultation have specific competencies regarding patient safety in the emergency room, cultural competence, communication and clinical interview, interpersonal relationship skills, management of specific computer systems in the area, and result orientation.[12]

Basic triage by nurses in the ED has been defined as the Reception, Welcome, and Sorting of patients[13,14] and is based on the Spanish Triage System with five levels of classification, like its predecessors, the Manchester Triage Scale and the Andorran Triage Model.[15,16] Recently, with the boost of APN graduate training, advanced patient sorting or advanced triage is being carried out at the PCEDs, in which APN nurses can refer urgent cases to the reference hospital, offer recommendations and support if the patient has to stay at home, mobilize the corresponding PC team, or resolve the situation immediately and discharge the patient. [6] Previous studies in different health systems on the role of APNs or equivalent suggest that they provide better access and reduce waiting times, with similar resource use to that of primary care physicians, including the number of referrals, admissions, revisits and prescriptions, and an even better patient experience.[17-21]

Despite these results, the impact of nurse presence in patient triage in the PCEDs has not been specifically analyzed. The analysis of some outcome indicators before and after the inclusion of APN nurses competencies in the PCED triage may provide evidence to support the progress of APN nurses in advanced patient sorting and in managing emergency care demandin PC. The objective of this study was to determine the influence of nurses in sorting patients in the PCED though a comparative study of priorities and discharge referrals in relation to the reasons for consultation, before and after the inclusion of nurses in this process in the PCED of Granada (Andalusia) in Spain.

Methods

A descriptive retrospective study was carried out comparing the emergencies treated in the PCEDs of the Basic Health District of the city of Granada. This district is made up of three PCEDs: La Chana, Zaidín, and Gran Capitán. The areas covered by the different PCEDs are heterogeneous, both in terms of their size and the characteristics of the population they treat; all of them cover city areas and rural localities of the metropolitan area.[22]

The data were obtained from DIRAYA URGENCIAS (DIRAYA-U), which is the health information system of the Andalusian Health Service. The data were provided in an anonymized form and subsequently exported to a database created ad hoc for this study. The database was initially refined by excluding incomplete records concerning the study variables. The years 2017 and 2019 were compared. In 2017, patient sorting was done only by the physician, and in 2018 the incorporation of nurses into patient sorting began, a process that lasted several months, being completed and in force in 2019.

The variables analyzed in the assistance requests were: Age (< 14 years, 15-65, and > 65 years); Sex; PCED (La Chana, Zaidín and Gran Capitán); Type of discharge referral (Admission to another center, Voluntary discharge, To home, To specialist, *Exitus letalis*, Escape, Home hospitalization, Cross-consultation attended, To family physician, To mutual insurance company, Does not attend, Other, Transfer to outpatient care, Transfer to hospital accompanied by medical staff, Transfer to another hospital, Transfer to another service); Priority levels (from I to V) according to the Spanish Triage System; and Reason for consultation (corresponds to the 179 symptoms predetermined in the DIRAYA-U system). To facilitate the analysis, the reasons for consultation were grouped according to ICD-9 coding, although some were treated independently because they fall into various categories of this classification system. For the comparative analysis, only discharges to home, referrals to the family physician, or hospital transfers were considered, since together they accounted for 98.6% and 98.9% of cases in the respective years of study.

The variables level of priority and type of discharge referral and their relationship with the reasons for consultation can be considered indicators of nursing care activity in the sorting and management of care requests. Regarding data analysis, the variables were described by calculating frequency and percentage. To compare the two study years, the Chi-square test or Fisher's exact test were used for categorical variables, whichever was appropriate. A statistical significance level of 0.05 was considered. The analysis was performed with IBM's SPSS© v.26 software.

This study was approved by the Andalusian Research Ethics Committee on January 11, 2021, with code EPA_SUAP.

Results

The number of emergency care requests was 418,528 in 2017 and 460,304 in 2019. After excluding incomplete records, 41295 records were analyzed, 18,663 (45.19%) in 2017 and 22,632 (54.80%) in 2019 (Figure 1).

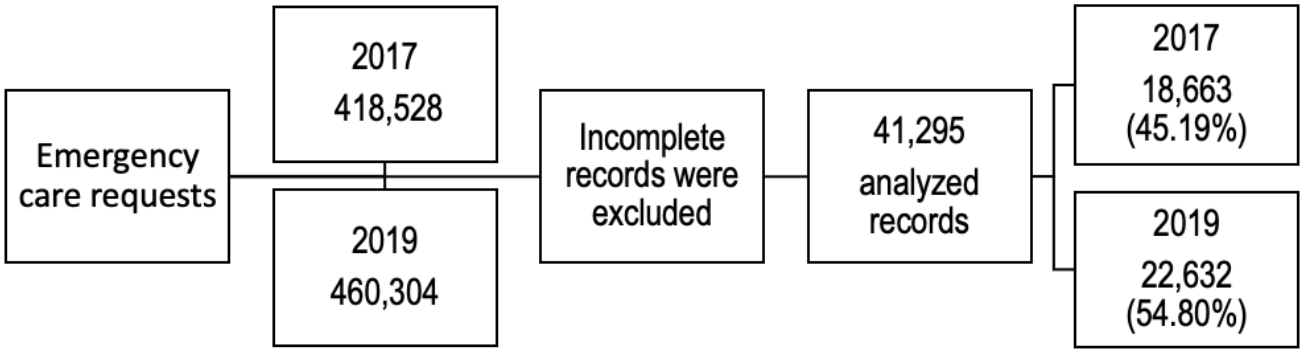

Figure 1. Study scheme

Regarding the characteristics of the analyzed records in both years, an increase of patients in the age range between 15-65 years ($p<0.001$), in the percentage of female patients ($p=0.004$), and in patients being cared for at the PCED La Chana ($p<0.001$) in 2019 with respect to 2017 was observed (Table 1).

Table 1. Comparison of the characteristics of the 2017 records (n=18663) with those of 2019 (n=22632)

Variables	2017 *n* (%)	2019 *n* (%)	*p*-value
Age			
Less than14 years old	1652 (8.9)	1612 (7.1)	<0.001
15-65 years old	14778 (79.2)	18255 (80.7)	<0.001
66 or older	2233 (12.0)	2765 (12.2)	0.434
Sex			
Male	7594 (40.7)	8892 (39.3)	0.004
Female	11069 (59.3)	13740 (60.7)	0.004
PCED			
La Chana	6791 (36.4)	9520 (42.1)	<0.001
Zaidín Centro	5421 (29.0)	5915 (26.1)	<0.001
Gran Capitán	6451 (34.6)	7197 (31.8)	<0.001

Some of the reasons for consultation have changed percentagewise in 2019 compared to 2017. Noteworthy is the increase in the percentage in 2019 of cases of diseases of the genitourinary system ($p<0.001$) and of malaise ($p<0.001$), and the decrease in the percentage of mental, neurobehavioral, and neurodevelopmental disorders ($p=0.029$), diseases of the circulatory system ($p=0.024$), and fever ($p<0.001$) (Table 2).

Table 2. Comparison of reasons for consultation between 2017 (*n*=18663) and 2019 (*n*=22632)

Reason for consultation	2017 *n* (%)	2019 *n* (%)	*p*-value
Endocrine, Nutritional and Metabolic Diseases	31 (0.2)	46 (0.2)	0.384
Mental, Neurodevelopmental and Neurobehavioral Disorders	689 (3.7)	746 (3.3)	0.029
Diseases of the Nervous System	16 (0.1)	17 (0.1)	0.704
Diseases of the Blood and Blood-Forming Organs and some Immunity Disorders	4 (0.0)	12 (0.1)	0.105
Disorders of the Eye and Adnexa	436 (2.3)	540 (2.4)	0.740
Diseases of the Ear and Mastoid Process	368 (2.0)	459 (2.0)	0.684
Diseases of the Circulatory System	411 (2.2)	427 (1.9)	0.024

Table 2. Comparison of reasons for consultation between 2017 (*n*=18663) and 2019 (*n*=22632) (Cont.)

Reason for consultation	2017 *n* (%)	2019 *n* (%)	*p*-value
Diseases of the Respiratory System	2907 (15.6)	3162 (14.0)	<0.001
Diseases of the Digestive System	2514 (13.5)	2706(12.0)	<0.001
Diseases of the Skin and Subcutaneous Tissue	2152 (11.5)	2768(12.2)	0.029
Diseases of the Musculoskeletal System and Connective Tissue	1993 (10.7)	2158 (9.5)	<0.001
Diseases of the Genitourinary System	1900 (10.2)	2965 (13.1)	<0.001
Complications of Pregnancy, Childbirth, and the Puerperium	5 (0.0)	1 (0.0)	0.098
Injuries, Poisonings and other External Causes	29 (0.2)	36 (0.2)	0.925
Dyspnea	183 (1.0)	210 (0.9)	0.583
Transient loss of Consciousness	1 (0.0)	0 (0.0)	0.452
Dizziness	427 (2.3)	455 (2.0)	0.052
Malaise	2261 (12.1)	3632 (16.0)	<0.001
Tremor	11 (0.1)	4 (0.0)	0.029
Fever	1938 (10.4)	1826 (8.1)	<0.001
Fatigue (not dyspnea) - Asthenia - Weakness – Lack of energy	28 (0.2)	35 (0.2)	0.905
Epistaxis	50 (0.3)	46 (0.2)	0.175
Lump in abdomen	3 (0.0)	5 (0.0)	0.737
Lump in neck	12 (0.1)	17 (0.1)	0.680
Vertigo	19 (0.1)	21 (0.1)	0.769
Headache	275 (1.5)	338 (1.5)	0.867

Regarding the priorities identified in triage, there was a notable increase in the percentage of emergencies identified as priorities IV ($p<0.001$) and a significant decrease in priorities V ($p<0.001$), showing a more distributed allocation of these priorities in 2019 than in 2017.

The detailed analysis of the relation between priorities and the reasons for consultation showed that, in 2019, there was an increase in cases of malaise classified as Priority II ($p=0.002$), and in cases of diseases of the circulatory system ($p<0.001$), dyspnea ($p<0.001$), malaise ($p<0.001$), and headache ($p<0.001$) classified as Priority III.

Cases of disorders of the eye and adnexa ($p=0.031$), of diseases of the skin and

subcutaneous tissue ($p<0.001$), of diseases of the genitourinary system ($p<0.001$), and of those characterized as malaise ($p<0.001$) classified as Priority IV also increased. Finally, the percentage of cases of diseases of the skin and subcutaneous tissue ($p<0.001$), of diseases of the genitourinary system ($p<0.001$), and of malaise ($p<0.001$), classified as Priority V also increased in 2019 (Table 3).

Table 3. Comparison between reasons for consultation according to level of priority (significant data)

Reason for consultation/priority	2017 *n* (%)	2019 *n* (%)	*p*-value
Priority I (Total)	7 (0.0)	10 (0.0)	0.739
Priority II (Total)	96 (0.5)	116 (0.5)	0.979
Malaise	1 (1.0)	14 (12.1)	0.002
Epistaxis	4 (4.2)	0 (0.0)	0.041
Priority III (Total)	1032 (5.5)	1107 (4.9)	0.004
Diseases of the Circulatory System	26 (2.5)	83 (7.5)	<0.001
Diseases of the Respiratory System	172 (16.7)	112 (10.1)	<0.001
Diseases of the Digestive System	187 (18.1)	139 (12.6)	<0.001
Diseases of the Musculoskeletal and Connective Tissue	133 (12.9)	71 (6.4)	<0.001
Dyspnea	12 (1.2)	44 (4.0)	<0.001
Malaise	82 (7.9)	167 (15.1)	<0.001
Headache	9 (0.9)	35 (3.2)	<0.001
Priority IV (Total)	1515 (8.1)	8989 (39.7)	<0.001
Disorders of the Eye and Adnexa	24 (1.6)	224 (2.5)	0.031
Diseases of the Respiratory System	314 (20.7)	1255 (14.0)	<0.001
Diseases of the Digestive System	224 (14.8)	1095 (12.2)	0.005
Diseases of the Skin and Subcutaneous Tissue	106 (7.0)	906 (10.1)	<0.001
Diseases of the Genitourinary System	160 (10.6)	1370 (15.2)	<0.001
Malaise	179 (11.8)	1556 (17.3)	<0.001
Fever	177 (11.7)	752 (8.4)	<0.001
Fatigue (not dyspnea) - asthenia - weakness – lack of energy	5 (0.3)	9 (0.1)	0.040
Priority V (Total)	16013 (85.8)	12410 (54.8)	<0.001
Diseases of the Circulatory System	342 (2.1)	183 (1.5)	<0.001
Diseases of the Digestive System	2088 (13.0)	1457 (11.7)	0.001
Diseases of the Skin and Subcutaneous Tissue	1955 (12.2)	1757 (14.2)	<0.001
Diseases of the Genitourinary System	1642 (10.3)	1497 (12.1)	<0.001
Dyspnea	144 (0.9)	85 (0.7)	0.045
Malaise	1999 (12.5)	1895 (15.3)	<0.001
Tremor	11 (0.1)	2 (0.0)	0.040
Fever	1644 (10.3)	943 (7.6)	<0.001

Regarding total referrals, home referrals decreased percentagewise in 2019 in comparison to 2017 ($p<0.001$), while family physician referrals increased ($p<0.001$). The detailed referral analysis regarding each of the priorities shows that, in 2019, for Priority III, hospital referrals ($p=0.002$) and home discharges ($p<0.001$) increased, while family physician referrals decreased ($p<0.001$). As for Priority V, the home referral percentage increased in 2019 (81.1%, $p=0.003$), while family physician referrals decreased ($p=0.011$) (Table 4).

Table 4. Comparison between priorities and the most prevailing referrals according to level of priority

Priorities	Referral Type	2017 ($n=18663$)	2019 ($n=22632$)	*p*-value
TOTAL	Hospital referral	316 (1.7)	416 (1.8)	0.267
	Home referral	14031 (75.2)	16682 (73.7)	<0.001
	Family physician referral	4052 (21.7)	5297 (23.4)	<0.001
Priority I	Hospital referral	6 (85.7)	7 (70.0)	0.452
	Home referral	1 (14.3)	3 (30.0)	0.452
	Family physician referral	0 (0.00)	0 (0.00)	N.A.
Priority II	Hospital referral	25 (26.0)	33 (28.4)	0.696
	Home referral	36 (37.5)	57(49.1)	0.089
	Family physician referral	32 (33.3)	24 (20.7)	0.038
Priority III	Hospital referral	31 (3.0)	64 (5.8)	0.002
	Home referral	243 (23.5)	562 (50.8)	<0.001
	Family physician referral	727 (70.4)	439 (39.7)	<0.001
Priority IV	Hospital referral	20 (1.3)	116 (1.3)	0.925
	Home referral	985 (65.0)	5992 (66.7)	0.210
	Family physician referral	498 (32.9)	2810 (31.3)	0.212
Priority V	Hospital referral	234 (1.5)	196 (1.6)	0.419
	Home referral	12766 (79.7)	10068 (81.1)	0.003
	Family physician referral	2795 (17.5)	2024 (16.3)	0.011

Detailed referral analysis according to the reasons for consultation showed that in 2019 hospital, home, and family physician referrals increased for those patients who went to the emergency room due to malaise; these referrals decreased for patients with fever. Those patients with skin and subcutaneous tissue diseases and genitourinary diseases were discharged to home in a higher percentage in 2019 ($p=0.008$ y $p<0.001$, respectively), and patients with genitourinary diseases were referred to family physicians in a higher percentage in 2019 (Table 5).

Table 5. Comparison of discharge referrals regarding the reason for consultation (significant data)

Reason for consultation/Discharge referral	2017	2019	*p*-value
Hospital referrals	***n*=316**	***n*=416**	
Malaise	24 (7.6)	62 (14.9)	0.002
Fever	41 (13.0)	27 (6.5)	0.003
Home referrals	***n*=14031**	***n*=16682**	
Mental, Neurodevelopmental and Neurobehavioral disorders	513 (3.7)	535 (3.2)	0.031
Diseases of the Respiratory System	2163 (15.4)	2355 (14.1)	0.001
Diseases of the Digestive System	1735 (12.4)	1874 (11.2)	0.002
Diseases of the Skin and Subcutaneous Tissue	1715 (12.2)	2209 (13.2)	0.008
Diseases of the Musculoskeletal System and Connective Tissue	1469 (10.5)	1599 (9.6)	0.010
Diseases of the Genitourinary System	1507 (10.7)	2172 (13.0)	<0.001
Malaise	1816 (12.9)	2733 (16.4)	<0.001
Fever	1479 (10.5)	1329 (8.0)	<0.001
Family physician referrals	***n*=4052**	***n*=5297**	
Diseases of the Respiratory System	705 (17.4)	760 (14.3)	<0.001
Diseases of the Digestive System	663 (16.4)	708 (13.4)	<0.001
Diseases of the Musculoskeletal System and Connective Tissue	457 (11.3)	498 (9.4)	0.003
Diseases of the Genitourinary System	367 (9.1)	748 (14.1)	<0.001
Dizziness	95 (2.3)	93 (1.8)	0.044
Malaise	394 (9.7)	803 (15.2)	<0.001
Fever	400 (9.9)	449 (8.5)	0.020

Discussion

In this study, we aimed to determine the influence of nurses when sorting patients in the PCED of Granada by means of a comparative analysis of the levels of priority assigned and discharge referrals regarding the reasons for consultation, before (in 2017) and after the inclusion of nurses in the process (in 2019). In the current international scenario, the roles played by healthcare professionals in primary care are being revised. On this matter, this study provides knowledge for proposing a hypothesis on the role nurses could play in emergency care within primary care.

The first surprising result was the high number of incomplete records in the DIRAYA-U system, which hampered the analysis of over 55% of the records from 2017 and over 45% from 2019. There is abundant literature on the quality of data and the problems in implementing digital records in emergency rooms, in which staff express that there are several problems in completing them, such as staff rotation, pressure to provide care, or excessive bureaucracy.[23,24] Other highlighted

problems are related to the complex structure of systems intended for the standardization of data (e.g., drop-down menus or restrictions in text input), which can lead to problems caused by system design.[25] However, it is necessary to point out that in 2019 the percentage of completed records improved noticeably. This can be explained by the inclusion of nurses in the triage record system and the implementation of the PCED. A recent study showed that nurses complete digital records more easily and feel more satisfaction when using them, regarding their collaborative aspects, than doctors, especially in primary care.[26]

Likewise, we found that, when compared to the standard patient sorting management in PCEDs, involving nurses in the process produced significant changes in the allocation of Priorities III, IV, and V, and in discharge referrals to home and to the family physician. We have found that the involvement of nurses has improved the assignment of priority levels in patient care, especially at low complexity levels. This is a result consistent with the innovation that resulted from nurse participation in improving the patient sorting system and broadening he perspective on the emergency itself, which entails including the perspective of care.[12,27] This means that, along with seriousness, aspects such as complexity or frailty are considered in the requests of patients, making it possible to distinguish more clearly those problems of lesser clinical concern.[12,28] Previous studies have pointed out the excellent quality of the care provided by these professionals, highlighting that the comprehensive emergency care they provide is safe and effective, patient-centered, timely, and efficient.[20,29]

Discharge decisions, however, seem to have been more poorly resolved with the intervention of nurses, since, overall, there were fewer in situ cases discharged to home and an increase in family physician referrals. However, the analysis of the relationship between Priorities and discharge referrals shows that in Priorities III and V, with nurse intervention, a significantly higher percentage of in situ cases was resolved with home discharge and a lower percentage of family physician referrals. This is consistent with the competencies described in emergency nurse consultation for low-complexity situations.[6] Several studies reported that nurses, with appropriate training, can manage low-complexity acute health problems with a quality of care comparable to that of general physicians in terms of problem resolution.[18,27] Some authors recommend being cautious with this type of results and increasing research when the role of the nurse in triage is not consolidated,[27,30] or when there is diversity in the training and experience of the nurses.[31,32] It should also be pointed out that in Priority V there was an increase in home referrals, which is relevant since, in addition to improving patient care, it also makes it more adequate and reduces the use of resources.

The analysis of the reasons for consultation in relation to priorities and discharge referrals showed that, compared to standard care, nurse intervention resulted in significant variations in the level of priority assignment of relatively emergent emergency or non-emergent situations (Priority III, IV, and V), as foreseen in the reference document.(6) Few studies address this perspective and this issue. The literature review by Laurant et al.,(20) which includes emergency care in PC, although it does not analyze it specifically, suggests that nurse-delivered care, compared to physician-delivered care (in PC), probably results in similar or better health outcomes for a wide range of patient conditions with a low to moderate level of evidence of certainty. Jennings *et al*.,[33] who analyzed the care provided by emergency nurses, found that the most common referrals were to home and to the family physician, consistent with our results. In their research they point out that emergency nurses practice a truly hybrid model of service delivery, having both medical and nursing skills with an emphasis on health promotion, education, and comprehensive care.

Consistent with this argument, we consider that the results of the indicators analyzed before and after the nurse intervention in patient sorting in the PCEDs offer some evidence that nurses can be autonomous when administering patient care and resolving minor clinical problems, following the concept of nurse patient request management and the role of the APN,[34] who, under an agreed protocol and within their scope of competence, carries out advanced patient sorting while managing emergency requests in PC. However, further studies are needed to confirm and broaden these results. It also remains to be determined whether the competencies of the triage nurse in the PCED are developed similarly during periods of high patient visitation.

This study has limitations in generalizing its results since it is an observational retrospective study of one health district and three PCED units. Likewise, it was not possible to control for other variables that may have influenced priority classification and discharge referral, which may not depend on the presence of nurses in the triage process.

We can conclude from this study that these findings provide evidence of the role that nurses can play in emergency care in PC services concerning triage. The involvement of these professionals has been related to the determination of priorities, discharge referrals, and management of the reasons for consultation. This shows that these professionals may have some autonomy in patient care and in the resolution of minor problems in PC emergency settings.

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"My Kidney Disease, My World as an Arena:" Unpacking the Situation of Adolescents from the Perspective of Postmodern Grounded Theory

Original Article

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"My Kidney Disease, My World as an Arena:" Unpacking the Situation of Adolescents from the Perspective of Postmodern Grounded Theory

Abstract

Objective. To explore the meanings of quality of life for adolescents with chronic kidney disease (CKD). **Methods.** This qualitative study was conducted using a grounded theory situational analysis approach, following the interpretive turn. Four in-depth interviews were conducted with adolescents with CKD, five with parents, and four with healthcare professionals (three nurses and one physician). The collected data were analyzed using situational maps, social world/arenas maps, and positional maps, as proposed by Adele Clarke. **Results.** The characterization of these adolescents' situations shows that they are the main actors and modify their social role when they suffer from CKD. It is the mothers that traditionally care for them, until they regain their health. The social world map shows the interactions among the worlds of individuals, their

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families, and the healthcare system, constituting a well-being arena which defines the quality of life for adolescents with CKD. Discursive positions constitute a key element in the discussion concerning the relational dimensions of well-being and the feelings emerging in relation to the disease. **Conclusion.** For adolescents with CKD, quality of life is defined as the state of well-being emerging from the recognition of their own environment in micro-, meso-, and macro-systems, which bring together structural (political, cultural, symbolic) elements, discursive constructions, and the integration of interactions in the social arenas, as well as the representation of the main discourses and their positions.

Descriptors: qualitative analysis; quality of life; nursing; grounded theory; adolescent health.

"Mi enfermedad renal, mi mundo de arenas": desentrañando una situación del adolescente desde la teoría fundamentada posmoderna

Resumen

Objetivo. Explorar los significados de calidad de vida para el adolescente con enfermedad renal crónica. **Métodos.** Estudio cualitativo con enfoque de teoría fundamentada con análisis situacional de giro interpretativo. Se entrevistó en profundidad a cuatro adolescentes con enfermedad renal crónica, cinco padres de adolescentes y cuatro profesionales de la salud, tres enfermeros y un médico. El análisis de los datos se realizó bajo la construcción de cartografías situacionales, de mundos y arenas sociales y mapa de posiciones propuesto por Adele Clarke. **Resultados.** La caracterización de la situación del adolescente muestra que él es el actor principal que modifica su rol social al padecer la enfermedad renal crónica; la madre asume el cuidado del adolescente hasta que alcance el estado óptimo de salud. El mapa de mundo social muestra las interacciones entre los mundos individual, familiar y de los sistemas de salud en una arena de bienestar que para el adolescente con ERC define su calidad de vida. Las posiciones discusivas denotan el eje de debate para las dimensiones relacionales de bienestar y sentimientos emergentes de la enfermedad. **Conclusión.** Para el adolescente con ERC la calidad de vida se define como el estado de bienestar que surge desde el reconocimiento de su propio entorno en un micro, meso y macrosistema que vincula los elementos

estructurales (políticos, culturales, simbólicos), las construcciones discursivas y la integración de las interacciones en las arenas sociales y la representación de los principales discursos y sus posiciones.

Descriptores: análisis cualitativo; calidad de vida; enfermería; teoría fundamentada; salud del adolescente.

"Minha doença renal, meu mundo de areia": desvendando a situação de um adolescente a partir da teoria fundamentada pós-moderna

Resumo

Objetivo. Explorar os significados da qualidade de vida para adolescentes com doença renal crônica. **Métodos.** Estudo qualitativo com abordagem de teoria fundamentada com análise situacional de giro interpretativo. Foram entrevistados em profundidade quatro adolescentes com doença renal crônica, cinco pais de adolescentes e quatro profissionais de saúde, três enfermeiros e um médico. A análise dos dados foi realizada sob a construção de cartografias situacionais, de mundos e arenas sociais e de um mapa de posicionamentos proposto por Adele Clarke. **Resultados.** A caracterização da situação do adolescente mostra que ele é o principal ator que modifica seu papel social ao sofrer de doença renal crônica; A mãe cuida do adolescente até que ele alcance a saúde ideal. O mapa do mundo social mostra as interações entre os mundos do indivíduo, da família e do sistema de saúde em uma arena de bem-estar que para o adolescente com DRC define sua qualidade de vida. As posições de discussão denotam o eixo de debate para as dimensões relacionais do bem-estar e dos sentimentos emergentes da doença. **Conclusão.** Para os adolescentes com DRC, qualidade de vida é definida como o estado de bem-estar que surge a partir do reconhecimento do próprio ambiente em um micro, meso e macrossistema que articula elementos estruturais (políticos, culturais, simbólicos), construções discursivas e integração de interações nas arenas sociais e a representação dos principais discursos e seus posicionamentos.

Descritores: análise qualitativa; qualidade de vida; Enfermagem; teoria fundamentada; saúde do adolescente.

Introduction

Adolescence is a stage that begins with pubertal changes, characterized by deep biological, psychological, and social transformations. Many of these generate crises, conflict, and contradictions. The World Health Organization (WHO) indicates that adolescence is the stage that takes place from ages ten to nineteen, with two distinct phases: early adolescence (ages ten to fourteen) and late adolescence (ages fifteen to nineteen).[1] When chronic kidney disease (CKD) occurs at this stage, it causes changes in everyday life with an impact on daily activities. These are the result of constant clinical controls and analyses, recurring hospital stays, a diet with limited consumption of food and beverages, drug intake several times a day, and frequent invasive procedures which lead to the interruption of school activities.[2]

Treatment of CKD causes medical dependence in adolescents, which interferes with regular activities during this stage, such as playing, studying, developing, and growing.[3] Furthermore, it affects their own body image, sexual identity, social relations, emotional attachment, and education/vocation. It also results in an adjustment of society's expectations regarding the level of maturity in their behavior and the values they should have internalized by then if they are to become adults.[4] Additionally, this condition results in adolescents being separated from their group of friends, increased dependence on their parents or caregivers, and uncertainty resulting from delays in receiving transplants. All the elements mentioned above produce a decline in the quality of life of those suffering from CKD, thus limiting typical development in adolescents.[5] As a process, this disease causes changes in family routines and social coexistence among adolescents, as they face specific needs in terms of diet and treatment, to name but two, which trigger emotional, physical, and social imbalances. These influence each individual adolescent's perception of quality of life and their overall sense of well-being.

With all the above in mind, this study is set to examine the situation of adolescents with CKD from the perspective of the meanings of quality of life, based on the situational analysis (SA) model as advanced by Adele Clarke.[6] The ultimate goal is to present a postmodern perspective on the social complexities and multiplicities of a phenomenon that mobilizes political platforms. Furthermore, through this type of studies, it is possible to assess health as a measure of well-being to be used in the professional practice of nursing. This study provides feedback on comprehensive care incorporating subjective elements that articulate the philosophy of nursing and the acknowledgment of caregiving. In sum, the purpose of this study was to explore the meanings of quality of life for adolescents suffering from CKD.

Methods

Design and Participants

This qualitative study was conducted from the perspective of grounded theory with situational analysis (SA) following the interpretive turn as proposed by Adele Clarke[6]. The study was conducted in the city of Cartagena, Colombia, between 2020 and 2022. An inductive-abductive approach was used following the postmodern, poststructuralist, and interpretive paradigms that underpin the understanding of a lived situation, through new conceptualizations that make it different from other epistemological approaches to grounded theory (GT). Clarke draws from Michel Foucault's work,[7] specifically his concepts of discourse, discipline, *dispositif* (or apparatus), and conditions of possibility. She also uses the concepts of rhizomes and assemblages, as developed by Deleuze and Guattari.[8] Based on these metaphors, she proposes *relationalities* between worlds that can be modified and interconnected. She also draws from actor-network theory to discuss relevant nonhuman elements found in a given situation.[6]

The sample of participants was composed of thirteen actors: four adolescents, five parents, and four healthcare professionals (three nurses, one physician). To ensure data variability, participants were included applying the following criteria: adolescents, 10 to 19 years of age;[1] diagnosed with grade 3 to 5 CKD for over six months; renal replacement therapy or treatment (dialysis, hemodialysis). Parents had to meet the following requirements: parents of an adolescent suffering from CKD, currently cohabitating with them, and having been present throughout the diagnosis and treatment process. For healthcare professionals, the requirements included a degree in internal medicine, nursing, nutrition or psychology, and having provided healthcare at renal units or institutional support services.

Snowball sampling was implemented, followed by theoretical sampling to define the number of participants required to reach theoretical saturation. In this way, the amount of data and information required to create the different maps was delimited.

Data Collection

Data collection took place by means of in-depth interviews conducted through videocalls or via Google Meet. Adolescents were to be accompanied by their parents or main caregiver. Participants were interviewed while at their place of residence. Interviews were conducted by the project's main researcher—a nurse and PhD candidate in nursing—from April 2020 to July 2021. Two interview sessions took place, lasting from 30 to 60 minutes. Interview topics included everyday aspects of the adolescent's life, their diagnosis, changes in their habits since the diagnosis, response to the treatment, and a description of pleasant aspects of their current lives. During the sessions, only one participant refused to continue with the interview due to a complication in their symptoms. Another technique used here was a focus group composed of healthcare professionals and administrators at healthcare institutions (two psychologists, two nurses, one physician). The question leading the conversation was *How does the administrative process of healthcare and treatment of adolescents with chronic kidney disease work?* Each data collection technique was complemented with memos, research matrices, recordings, field notes, and analytical texts.

Concept Analysis and Identification

The mapping strategy developed by Adele Clarke was used here: 1) situational mapping; 2) social worlds/arenas mapping; and 3) positional mapping. Situational maps represent the human and nonhuman elements—as well as other elements—related to a situation of inquiry. Social worlds/arena maps show collective actors, arena(s) of commitment, and nonhuman elements. Finally, positional maps present discursive positions taken by actors in a given situation, causing differences, concerns, and controversies The interview transcripts were analyzed using Corbin and

Strauss's open coding.[9] The lines and paragraphs in the text were fragmented manually in order to extract descriptive and sensitizing concepts. Among the tools used for data classification, level-1 and level-2 data matrices were generated. The level-1 matrix included concepts used during the first stage of data collection. The level-2 matrix was used during the second stage, when descriptive codes, concepts, descriptive memos, and fieldnotes were unified and relationships between emerging concepts for each one of the actors were established.[10] The total number of text fragments was 566, with 233 sensitizing concepts, and 15 units of analysis.

Once the sensitizing concepts and units of analysis had been identified, ordered situational maps were created, following A. Clarke's parameters. A prior procedure included the design of messy situational maps and relational maps; in fact, eight and four were designed, respectively. As a result, similar or different concepts were highlighted, and those appearing most frequently in the analysis were linked to the ordered situational map. This map was designed following several questions: *Who is in this situation? What can be found in it? Who and what else may be important for this situation? What other elements can make a difference in this situation?*

During the construction of the maps, information was updated dynamically as interviews were analyzed. SA shares the conceptualizations proposed by A. Strauss in the context of GT, namely: theoretical sampling, information saturation, constant comparison, theoretical sensitivity, and descriptive/analytic memos.[10] Afterwards, the social worlds/arenas map was created, the purpose of which was to represent the nature of the situation and to interpret the changing facts in a collective event. To generate this map, all the data collected from the relational matrix were linked for each participant, with the purpose of triangulating the interrelations existing between the adolescent and their parents, as well as the health professionals. However, with the intention of saturating the data, a discussion group was set up. In the last step of the social arenas/worlds map design, the new data were incorporated into a matrix which was referred to by the authors as "conceptual dimension matrix." This matrix contributed to identifying the actions shared in common by actors in the situation. The social words/arenas map focuses on epistemological questions such as *What are the collective commitment patterns creating the social worlds at play here? Are there any groups with shared interests? Are there any organizations in these worlds? What are their interests in these actions?* Finally, the positional map was designed.

To generate this map, Clarke proposes using a Cartesian plane, where the y-axis (vertical) and the x-axis (horizontal) represent the relational dimensions to be extracted from the discourses and concepts originating in the ordered situational map and in the social worlds/arenas map. Thus, the positional map led to a reorganization of the two previous maps. Discourses in the positional map were ordered on a greater to lesser scale in the Cartesian plane in order to show the representativeness of the discourses present in the situation. At this point, a constant comparison between key concepts identified in the analysis, the findings in the literature, and the sensitizing concepts were the main components of the theoretical analysis.[6]

The positional map illustrates the main sensitizing concepts among the actors, the analytical memos, and the fieldnotes, which were brought together in discourses based on the following questions: *What are the subjects of debate and discussion among them? What are the bases for the discussion concerning the various positions?* The analysis was performed manually since, drawing in SA, drawing gives researchers freedom to build theoretical relationships to describe and understand a heterogeneous, complex, and fluctuating situation (Figure 1).

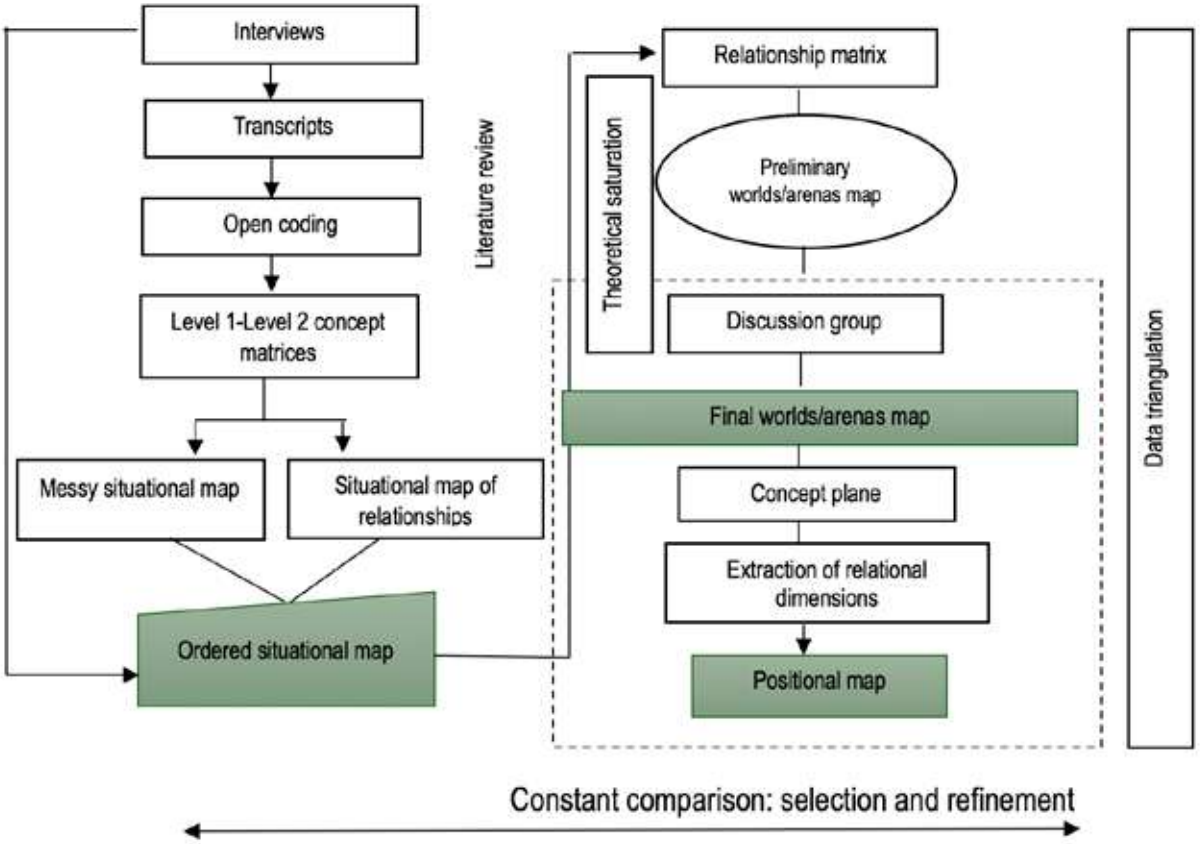

Figure 1. Data Analysis Model based on Situational Analysis GT, as proposed by Adele Clarke

Quality Criteria

This study complies with criteria of rigor, credibility, reliability, and applicability in its representation of data sources, technical validation, feedback to participants concerning the findings, scientific experience, and assessment. Furthermore, four participants reviewed the extracted concepts and provided feedback concerning the findings.[11] The lead author carefully considered her own thoughts and experiences to make decision-making criteria explicit, thus reducing risks of bias during data collection and analysis.

Ethical Considerations

This study complies with the ethical considerations presented in Resolution 008430 issued in 1993 by the Colombian Ministry of Health to regulate healthcare research. It also follows Ezequiel Emmanuel's seven ethical principles.[12] Approval was obtained from the Ethics Committee at the Faculty of Nursing, Universidad de Antioquia, Colombia (Minute CEI-FE 2020-03) to apply the informed consent form, record interview sessions, and keep the data secure and confidential. Parents, healthcare professionals, and adolescents gave their informed consent via online forms. They received information about the nature of the

study and recorded their authorization. A copy of the consent form was sent to their home for verification purposes.

Results

Table 1 shows in detail the ordered situational map, identifying the main elements in the situation of adolescents with CKD, such as main actors, political, sociocultural, symbolic, and environmental elements, as well as discursive constructions.

Actors in the situation. Actors in this situation became main actors; their function was to provide support and face the disease after it has been diagnosed. The main actors in this situation are the adolescents suffering from the disease and experiencing the symptoms and the treatment and modifying their social role. Mothers also serve as main actors, as they assume the role and practices of caregivers so that the adolescents can regain their health and to prevent disease-related complications. Fathers appear as male role models, the providers who respond to basic family needs. When an adolescent is diagnosed with CKD, family ties grow stronger; as a result, peers become allies who share leisure time. Nonhuman aspects constitute another relevant element in this situation: adolescents identify cyclers as nonliving elements that become a part of their everyday lives and relationships, thus establishing networks of social interaction that carry meanings with them.

Political, sociocultural/symbolic, temporal, and spatial elements. Several political or economic elements derived from the healthcare system determine the situation of an adolescent with CKD. Among them, we may mention the increase in medical expenses; access to health services; constantly traveling to other areas to obtain treatment; complying with transplant guidelines and other administrative procedures from the perspective of healthcare providers; and fragmentation in the delivery of healthcare. Culturally and symbolically, body image, sexuality and spirituality are elements that condition this situation. Temporal elements include events in the adolescents' everyday lives they need to face, such as changes in treatment modalities and the interruption of school activities to undergo the recovery process. The most important spaces for their quality of life are the hospital, renal units, intensive care units, school, and their own home.

Discursive constructions of individual/collective human and nonhuman actors. Collective actors such as teachers, family and healthcare professionals produced discourses that contributed to an understanding of quality of life. They demonstrated their concern for such issues as adaptation and reaction to the diagnosis; everyday life; the interruption of school activities due to warning signs, symptoms, and complications resulting from the disease; and type of treatment. Discourses concerning nonhuman actors highlighted how adolescents modify their role in life, adjusting to their treatment and complications resulting from their disease. Finally, transplants are the preferred treatment option, but long administrative procedures usually result in failure to obtain one.

Debates and related discourses. The discourses by the participants revolve around topics such as failure to provide adequate care; limited healthcare access; kidney transplants as a life-changing option; age and type of treatment received; loss of interest in typical adolescent activities; rapid changes in the lives of adolescents and their families; development of autonomy versus non-maleficence on the part of healthcare professionals; and intervention opportunities (comprehensive group support). These are some of the most common situations discussed in the interactions among the actors in this context. Through these discourses, it is possible to see how such a complex system is created and reveal emotional aspects, experiences, and changes taking place when someone suffers from a kidney disease. As a result, solutions and intervention alternatives can be offered as part of a micro-, meso-, and macrosystem (Table 1).

Table 1. Situational Map for Adolescents with CKD

Individual human elements/actors	**Nonhuman elements/actors**
Adolescents	Technology – cellphones
Mothers	Cycler
Nurses	Pharmacotherapy
Pediatric nephrologist	Pharmacological intervention
Siblings – Friends – Cousins	Animals
Researcher	Toys
Psychologists – Social workers	Medical devices (access)
Father	Alternative care
Collective human elements/actors	**Implicated/silent actors/actants**
Teachers	Father
Healthcare professionals	Friends
Family	
Hospitals – Renal Units	
Intensive Care Units	
School – Educational institution	
Transplant unit	
Home	
National government – Healthcare policy	
Public and private healthcare institutions	
Discursive constructions of individual and/or collective human actors	**Discursive constructions of nonhuman actors**
Adjusting to the disease	Transferring one's life experience to play
Adolescent autonomy – responsibility	Treatment device
Interrupting academic life	Expectations concerning treatment options
Everyday life / activities	Dietary changes
Absence of relationships with friends	Waiting periods in healthcare
Physical complications due to CKD	Kidney transplant guidelines
Individual reaction to a CKD diagnosis	
Parent suffering	
Body changes	
Age-dependent treatment	

Table 1. Situational Map for Adolescents with CKD (Cont.)

Political/economic elements	Sociocultural/symbolic elements
Increase in medical expenses	Body image
Access to healthcare services	Sexuality
Constant travelling to other areas	Spirituality
Transplant guidelines	Mother empowerment concerning healthcare
Access and opportunity in healthcare services and support from interdisciplinary team	Fear of death
Administrative process (admission, discharge, healthcare provision)	Changing roles (family dynamics)
Healthcare fragmentation	Social life (friends, family, social circle)
	Job opportunities
Temporal elements	**Spatial elements**
The future: projects and limitations	Hospital
Treatment modality	Renal units
Changes in one's surroundings, Covid-19 Pandemic	Intensive care units
Interrupting school activities	Social reintegration
Life before vs. after the disease	School
	Home
Major issues/debates (usually contested)	**Related discourses (historic, narrative, and/or visual)**
Shortcomings in health provision	Positive attitude in face of the disease
Limited healthcare access opportunities	Selective friendships
Kidney transplant as a life-changing option	Changing roles (changes in family dynamics)
Age and type of treatment	Coming to terms with a CKD diagnosis
Lack of interest in traditional adolescent activities	Father as an agent in healthcare
Rapid changes in the lives of adolescents and their families	Overprotective parents
Autonomy vs. non-maleficence in healthcare	
Intervention opportunity – comprehensive group support	

"My social world, my world as an arena." Adolescent interactions. In the social arena, In the social arena, three worlds interact: the individual world, the family world, and the healthcare system world.

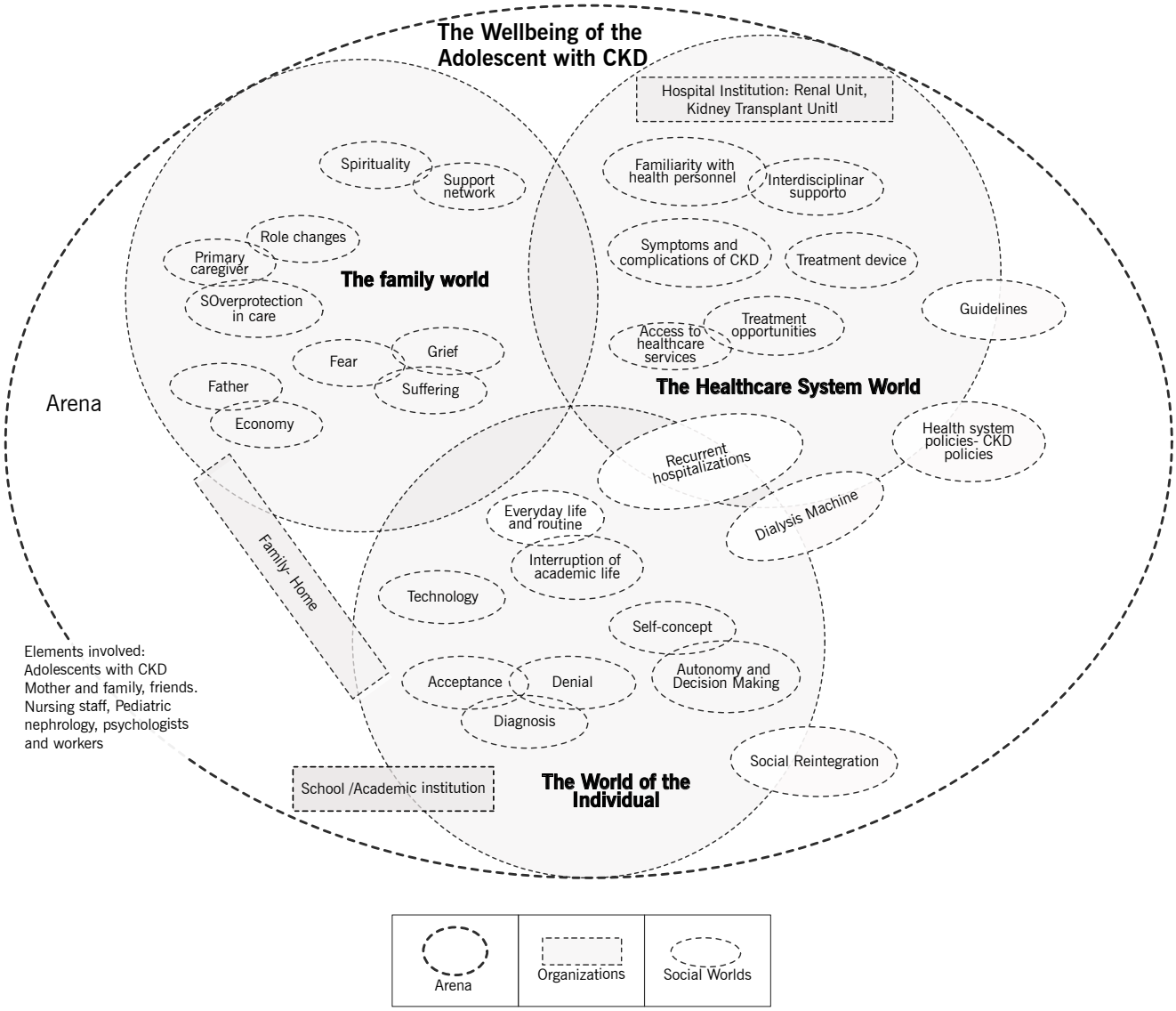

Figure 2. Social world/arenas map of adolescents with CKD

Individual world. Elements represented in this map include the individual's self-concept, autonomy, and decision-making process. Other elements such as technology, the dialysis machine, recurring hospitalizations, and the interruption of school life condition the way in which adolescents participate in their own treatment and their social reincorporation into an everyday life environment.

For adolescents with CKD, their self-concept includes feeling well about themselves and about the people surrounding them; it also includes being satisfied with the way their life is going, their environment, and their behavior, which are interwoven with their interpersonal relationships, job opportunities, academic life, and building a love/family life. To that effect, one of them said:

... my hair and my personality are tamer than before; I used to be rebellious. In the future, I see myself with a transplant, with a career, a family, and children, my family... all together (Teenager 2, 14 y/o, Female). Because of her own sense of autonomy she can rationalize the complexity of her disease, taking on responsibilities concerning her own care which contribute to her recovery and rehabilitation. Nevertheless, in the context of a chronic disease, there are tensions between dependence and independence. As a result, developing autonomy takes longer than usual and dependence on caregiving from parents increases. About this issue, one of them said: *I go to my grandma's place, by myself. If I have to go to the unit for a test or a physical, I go alone, and so on* [...] *Also, let's say, if I have to take a pill, or go to dialysis, I mean everything, as a daily routine. If I have to go out, I go out; if there's something I need to do about my treatment, I do it* (Teenager 2, 19 y/o, Female).

Family world. The family world of adolescents with CKD includes their main caregivers, their tasks, changing roles, feelings, fears, support networks and anything else providing support during the disease. It is usually the mother who becomes the main caregiver, sometimes even being forced to stop working to provide more care and protect the home environment/hygiene: *Moms become empowered when taking care of their kids. They are very careful when it comes to disinfection. They are always paying attention to their emotions. Most mothers are very supportive when it comes to caregiving. They are always very calm, but also very careful* (Health professional 2, female, nurse). Mothers, as the main caregivers, usually adopt an altruistic and tenacious disposition when they need to learn anything concerning the wellbeing of their children. In addition to this, there are also some values that are traditionally associated with the nature of the relationship between mothers and children, which have to do with selflessness and greater affection when compared to the more practical role of fathers as providers: *ever since dialysis began, my husband has always been with us, always ready for any process related to the transplant; he is the one who goes to the HMO, you know how complicated everything is with them* (Mother, 44 y/o). Concerning emotions, adolescents and their families adopt coping strategies to overcome negative feelings. Here, support from health professionals, psychologists, and social workers helps in rationalizing the disease, which contributes to a better treatment and greater patient wellbeing at every level of human life (social, individual, cultural, etc.). One of them explained: *At the kidney unit, psychologists have helped her a lot: they talk to her, they tell her she can live a normal life, there is no reason this should affect her, and she's taken really well to that* (Mother 4, 52 y/o). In sum, families and adolescents engage in processes that aim to modify, alleviate, strengthen, and transform both their own subjective experiences and the way in which they express their emotions, be them positive or negative. At this point, spirituality and support networks provide strategies to address any problem affecting their emotions.

Health care system world. In the world of healthcare systems, a macro-contextual conception is represented. Elements here include policies regulating health institutions and treatment options, as well as access to treatment and health services. In the arena of adolescents with CKD, access to health services and treatment opportunities contribute to comprehensive healthcare and wellbeing concerning education, information, health promotion, diagnosis, treatment, and rehabilitation, in accordance with the principles of quality, efficiency, and opportunity established in Law 100, 1993, which regulates healthcare in Colombia. In the Colombian healthcare system, there are sectoral gaps and obstacles to access treatment and services offered by Health Maintenance Organizations (HMOs), such as referrals, tests, and access to specialists (nephrologists). Nevertheless, there are also health access opportunities, such as the possibility to choose between treatment options, which contributes to a sense of comfort and well-being and thus improves quality of life of

adolescents, and, consequently, their families. One of them reported: *The chief said: 'if you want, we can give you the machine; then they brought the dialysis machine. Every night I get connected; it's been four years now* (Teeneger 1, 19 y/o, Female). When it comes to adolescents, the healthcare system world shows how healthcare policies and guidelines for attention enforced by health institutions have an impact on healthcare opportunities and access. Adolescents and their families are immersed in this world as citizens in a welfare state that offers healthcare protections and considers healthcare to be a human right. In this context, health care constitutes a relational experience between the individual and state organizations from a perspective of power and resistance. As a result, intersubjective meanings about well-being and the way society works are constructed.

Positional map: discursive positions of actors in the situation. The wellbeing of adolescents with CKD is a shared interest among the adolescents themselves, the medical team, and the family. Well-being in this context is understood as the subjective state reached by adolescents with CKD when there is a balance between their health and the social, psychological, cultural, economic, and political dimensions in their lives. When such balance is achieved, they can form positive judgments concerning their own reality. In this sense, the relationship between this shared interest and emerging feelings point to a great level of well-being in the discourses coming from different actors surrounding adolescents with CKD; as a result, they also reach a state of balance and peace. Along its vertical axis, the positional map represents what quality of life (well-being) means to adolescents; the horizontal axis represents a major debate issue: the feelings emerging during the disease. On the other hand, each discursive key was organized following several representative positions in a scale from greater (+) to lesser (-), as follows in Figure 3:

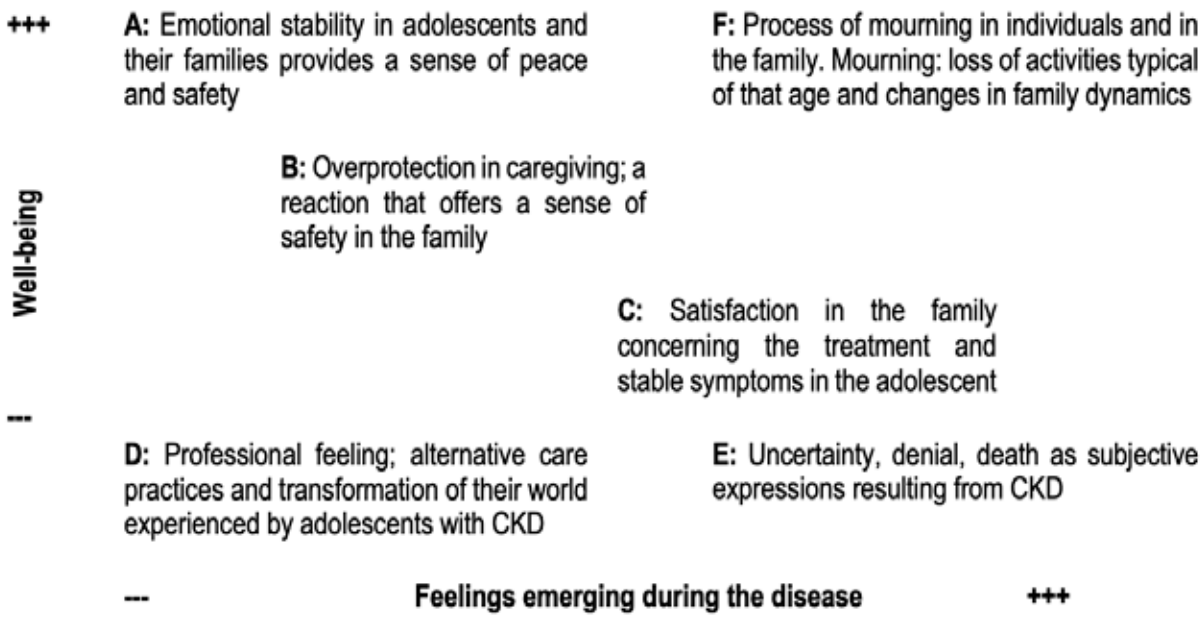

Figure 3. Positional map 1: Well-being – feelings emerging during the disease

Discussion

This situational analysis of adolescents with chronic kidney disease shows that the meanings of quality of life they construct are the result of an interpretation of their feeling of well-being during the disease. Such interpretation emerges from their self-concept, the exercise of their autonomy, and support from their families and society, specifically healthcare institutions and the way they handle their treatment in adolescents' individual world, their self-concepts allow them to shape their personalities in order to bond and engage in social competition with peers. As a result, they develop their self-confidence, learn how to overcome obstacles, and reach their current and future goals.[13] Through a constant search for life's meaning, adolescents can strengthen their analytical and critical skills and develop a stronger identity, reinforcing their values, ideas, and connections.

Consequently, committing to positive thinking when facing disease results in greater control over situations (autonomy);[14] experiencing positive emotions provides resources to successfully face health problems, resulting in healthier feelings such as joy, love, satisfaction, and hope.[15] Thus, when adolescents and their families develop positive emotions, they are protecting themselves against the stressful or traumatic situations they are going through and learn how to cope with stressful events.[15] At the family level, adolescents construct a system of interactions which change the structure of the family and have a social impact. As a result, social changes brought about by postmodernity—such as the deinstitutionalization of family; changing conceptions of legitimate or illegitimate families; divorce; assisted fertilization; changing social representations of sexual diversity and gender; parenthood; and even the role of women in the family and in society—alter family functions and overload family roles.[16] In the context of overloads and the quality of life of caregivers for children with cancer, it has been suggested that said caregivers—in addition to coping with the diagnosis, mood changes in their relatives, uncertainty concerning the disease, and attending to other needs—should be concerned for their own emotional conflicts, e.g., abandoning or postponing their work or social activities, economic problems, or neglecting their own health, which modifies their daily life dynamics and is related to their spirituality.[17]

In fact, spirituality offers some solace to adolescents and their families as they seek for meaning in the challenging times they are going through as a result of CKD. Furthermore, it offers self-control, emotional comfort, and physical and mental balance that can be lifechanging. Balboni *et al.*[18] present spirituality as a subjective form of knowledge, which should be seen from a broader perspective. When going through situations of disease, beyond the evident challenges, there is also room for personal growth, gaining a new perspective on life and finding a chance to help others.

Another issue to be considered is the way in which the Colombian healthcare system has introduced changes in the way it deals with chronic diseases. According to the Pan American Health Organization,[19] healthcare systems should provide access to high quality equipment and guidelines to offer services in a timely, accessible, and fair manner, complying with healthcare policies and ethical mandates. The Colombian Fund for High-Cost Diseases considers CKD as a catastrophic disease, which negatively affects a self-managed system. The model through which the disease is addressed includes several processes such as pathology detection, specific treatments, and service provision at various levels, which ultimately condition clinical practice.[20]. As a result, access to health services and treatment opportunities (considering that chances to receive a transplant are limited) contribute to achieving a degree of well-being in the arena of adolescents with CKD. As mentioned before, components of well-being in this respect include health education, information, promotion, diagnosis, treatment, and

rehabilitation, in accordance with the principles of quality, efficiency, and opportunity as established in Law 100.[21]

The relationship between adolescent well-being and the feelings resulting from their diagnosis lead to an exploration of the individual's subjective feelings, as pointed out by Kogon and Hooper.[22] Emotions and feelings occurring during the disease emerge as a natural response to the adaptation and rationalization process in the face of a chronic disease diagnosed during adolescence. Furthermore, the feeling of losing control as a result of the diagnosis, the warning signs and symptoms, dependence on caregivers, a decline in physical integrity, and a restricted lifestyle negatively affect the emotional condition of adolescents.

An analysis of the phenomena related to quality of life from the perspective of adolescents and the interaction with their environment results in meaning-construction processes, which provide nursing scholars with a critical, interpretive perspective. Looking into the social events that surround human beings and attributing meaning to them can bring nurses closer to understanding the meaning adolescents give to their disease as a process. This approach can help solve problems in nursing practice and improve the quality of care offered during treatment. This study offers a critical analysis of real phenomena experienced by adolescents with CKD from the perspective of individuals, society, families, and healthcare professionals. A major contribution of this study is the use of a qualitative methodology following a social approach—one which is rarely used by nursing scholars in Colombia—to analyze the complex situation of adolescents from different perspectives. Furthermore, the theoretical, philosophical, and methodological tools used here provided a deeper understanding of the phenomenon being researched. This study adopted an interdisciplinary approach, in which interrelations were studied as social constructions from a perspective that brings together social, cultural, political, economic, and individual spheres. The theoretical approach presented here offers a specific definition of the quality-of-life construct in adolescents with CKD, associating it with the concept of well-being. Consequently, quality of life is understood at a subjective level as a relationship between sensitizing elements which contribute to the careful consideration and interpretation of the meanings that emerge when suffering from a chronic disease.

Some of the limitations of this study include difficulties during the data collection stage, as interviews had to be conducted online due to the restrictions resulting from the Covid-19 pandemic; this may have interfered in the process due to network failures. Furthermore, there may have been some bias resulting from the absence of a field journal to offer a more detailed account of interviewees' attitudes. Additionally, the distance of online interviews may have prevented interviewers and interviewees from forming stronger bonds. A major obstacle was the typical complications of CKD, which contributed to worsening symptoms in the adolescents and concomitant negative emotions in parents. This resulted in some of them refusing to participate in second interviews, which made it difficult to contrast their data.

In conclusion, looking into the situation of adolescents from the perspective of grounded theory situational analysis allowed us to determine that the meanings of quality of life for adolescents are related to the emotional, physical, economic, and family stability that emerges during the CKD process. The state of well-being results from their acknowledgment of their own environment as part of a micro-, meso-, and macro-system which integrates structural elements (political, cultural, symbolic), discursive constructions, and interactions in social arenas, as well as the representation of the main discourses and positions. In this sense, the shared domains of the state of well-being include their physical health, emotional balance, family support, economic

resources, and adolescents' participation in healthcare services. Major components also include their autonomy, self-concept, body image, and spirituality.

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Prevalence and severity of nomophobia among nurses: A systematic review and meta-analysis

Original Article

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Prevalence and severity of nomophobia among nurses: A systematic review and meta-analysis

Abstract

Objectives. To determine the prevalence and severity of nomophobia (dread of not having a smartphone) among nurses. **Methods.** A systematic search was carried out across different electronic databases, including Medline (PubMed), SCOPUS Embase, CINAHL, EBSCO, and Google Scholar, until March 2024. The meta-analysis included studies that reported the prevalence of nomophobia in nurses and used the Nomophobia Questionnaire (NMP-Q). Two independent reviewers identified the studies, extracted the data, and assessed the risk of bias using Joanna Briggs Institute Critical Appraisal Tool. PROSPERO register number CRD42024512079. **Results.** A total 10 studies (4 in Italy and 6 in Turkey) with 3086 individuals were found to meet the inclusion criteria for the systematic review. However, data could not be retrieved for one research, thus nine studies being included in the meta-analysis. The Overall Prevalence of nomophobia was 68.15% (95% CI: 57.49%-78.81%; I^2 = 99%). The prevalence of mild nomophobia was reported to be 43% (95% CI, 24%-65%; I2 = 99%), moderate nomophobia was 31% (95% CI, 17%-50%; I2 = 99%), and severe nomophobia was 7% (95% CI, 2%-25%; I2= 95%). Country-specific analysis revealed that Turkish nurses had a greater level of nomophobia than their Italian nurses. **Conclusion.** Nurses have a high prevalence of mild to moderate nomophobia which emphasizes the need of preventative initiatives and tailored intervention for nurses in health care organizations.

Descriptors: meta-analysis; nurse; smartphone; systematic review

Prevalencia y severidad de la nomofobia entre las enfermeras. Una revisión sistemática y Meta-análisis

Resumen

Objetivo. Determinar la prevalencia y severidad de la nomofobia (temor a no disponer de un teléfono inteligente) entre las enfermeras. **Métodos.** Se realizó una búsqueda sistemática en diferentes bases de datos electrónicas, incluyendo Medline (PubMed), SCOPUS Embase, CINAHL, EBSCO y Google Scholar, hasta marzo de 2024. El metaanálisis incluyó estudios que informaron sobre la prevalencia de la nomofobia en enfermeras y que utilizaron el Nomophobia Questionnaire (NMP-Q). Dos revisores independientes identificaron los estudios, extrajeron los datos y evaluaron el riesgo de sesgo mediante la Herramienta de Evaluación Crítica del

Instituto Joanna Briggs. Registro PROSPERO número CRD42024512079. **Resultados.** Se revisaron un total de 10 estudios (4 en Italia y 6 en Turquía) con un total de 3086 individuos, de los cuales nueve se incluyeron en el metaanálisis. La prevalencia de nomofobia fue: global: 68.15% (95% CI: 57.49%-78.81%; I^2 = 99%), leve: 43% (IC 95%, 24%-65%; I^2 = 99%), moderada: 31% (IC 95%, 17%-50%; I^2 = 99%) y severa: del 7% (IC 95%, 2%-25%; I^2= 95%). El análisis por países reveló que las enfermeras turcas tenían un mayor nivel de nomofobia que las italianas. **Conclusión.** Las enfermeras tienen una alta prevalencia de nomofobia de leve a moderada, lo que enfatiza la necesidad de iniciativas preventivas y de intervención para las enfermeras en las organizaciones de salud.

Descriptores: metaanálisis; enfermeras y enfermeros; teléfono inteligente; revisión sistemática.

Prevalência e gravidade da nomofobia entre enfermeiros. Uma revisão sistemática e meta-análise

Resumo

Objetivo. Determinar a prevalência e gravidade da nomofobia (medo de não ter smartphone) entre enfermeiros. **Métodos.** Foi realizada uma pesquisa sistemática em diferentes bases de dados eletrônicas, incluindo Medline (PubMed), SCOPUS Embase, CINAHL, EBSCO e Google Scholar, até março de 2024. A meta-análise incluiu estudos que relataram a prevalência de nomofobia em enfermeiros e que utilizaram o Questionário de Nomofobia (NMP-Q). Dois revisores independentes identificaram estudos, extraíram dados e avaliaram o risco de viés usando a ferramenta de avaliação crítica do Joanna Briggs Institute. Registro PROSPERO número CRD42024512079. **Resultados.** Foram revisados 10 estudos (4 na Itália e 6 na Turquia) com um total de 3.086 indivíduos, dos quais nove foram incluídos na meta-análise. A prevalência de nomofobia foi: geral: 68.15% (IC 95%: 57.49%-78.81%; I^2 = 99%), leve: 43% (IC 95%, 24%-65%; I^2 = 99%), moderada: 31% (IC 95%, 17%-50%; I^2 = 99%) e grave: 7% (IC 95%, 2%-25%; I^2 = 95%). A análise por país revelou que os enfermeiros turcos tinham um nível de nomofobia mais elevado do que os enfermeiros italianos. **Conclusão.** Os enfermeiros apresentam alta prevalência de nomofobia leve a moderada, enfatizando a necessidade de iniciativas preventivas e de intervenção para os enfermeiros nas organizações de saúde.

Descritores: metanálise; enfermeiras e enfermeiros; smartphone; revisão sistemática.

Introduction

Data and communication technology have become an indispensable part of our modern civilization.[1] While its integration has improved and streamlined everyday activities, providing countless advantages to individuals,[2] it has also resulted in concerns related to addiction and an outbreak of issues related to mental health.[3] The pervasive and persuasive nature of smartphones has fostered negative habits among young people, akin to compulsive behaviours such as incessantly checking the phone for missed messages or calls, verifying the availability of a web connection, keeping the phone switched on 24/7, never leaving home without the mobile device, and using the phone even during conversations, thereby disregarding the other person (a behaviour known as "phubbing").[4] Furthermore, people may suffer "ringxiety," a phrase derived from "ring" and "anxiety," in which they falsely assume they have heard the phone ring.[5] These symptoms together appear as "Nomophobia," which is the dread of being disconnected or unable to utilize a mobile phone.[6] Other characteristics includes feelings of worry, emotional instability, hostility, discomfort, and difficulty in focus.[7]

The growing usage of mobile devices in the workplace has resulted in less time spent on tasks and more work interruptions. This has caused a shift in the nature of many employments, including those in the healthcare industry.[8] Nurses with high degrees of nomophobia frequently check their mobile device alerts[9] and this practice has a negative impact on many aspects of their lives, including sleep quality, eating habits, overall health, physical activity, attention span, and importantly their health care practices.[10] Because of nomophobia, nurses working in specialized units such as intensive care services, trauma and emergency, cardiac unit etc. may unknowingly overlook their caring obligations, resulting in medical errors. These mistakes can lengthen patients' hospitalizations, increase the cost of care per patient, and perhaps result in debilitating repercussions or even patient death.[11,12] There were some studies [13,14] which reported that majority of nurse had mild level of nomophobia while other studies [15,16] reported majority of nurse had moderate to severe level of nomophobia, emphasizes the complexity of the issue. Given this variance, it is critical to derive conclusions using a systematic review and meta-analysis method. So, our study aims to integrate current data on the prevalence of nomophobia among nurses in response to the growing challenge given by an expanding digital culture and the scarcity of research. Furthermore, we intend to identify the severity levels among nurses.

Methods

The systematic review adhered to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA Guidelines)[17] and Meta-analysis of Observational Studies in Epidemiology (MOOSE) criteria[18] (attached in Supplementary file S1 and S2 respectively). The study protocol was registered with PROSPERO under the registration number CRD42024512079.

Information Resources and the Search Equation. A systematic search was performed until March 2024, using five databases: PubMed, Scopus, Embase, CINAHL, and Google Scholar. The search strategy included MeSH/All term descriptors and various terms such as "Nomophobia," "No mobile phobia," "No smartphone phobia," "No mobile-phone phobia," "No smart-phone phobia," "fear of being without a mobile phone," "nomofobia," "fear of missing out cell phone," "fear of being without a smartphone," as well as terms related to nurses such as 'nurse,' 'nurses,' 'registered nurse,' 'RN,' 'Nursing officer,' and 'professional nurse.' Supplementary file S3 includes detailed search algorithms for each database. Furthermore, the reference lists from the selected researches were screened to find other relevant researches. The identified references were imported into Mendeley, and duplicates were deleted. Following that, two researchers independently looked into publications based on titles and abstracts to find possibly relevant items for inclusion. Selected research papers underwent full-text screening, which was additionally carried out separately by two authors. Any disagreements were handled through a conversation with a third author to reach an agreement on the final conclusion.

Study selection. Following the elimination of duplicate data, two reviewers independently evaluated the remaining records' titles and abstracts to identify possibly relevant research. The entire texts were then collected and evaluated separately by two reviewers. Studies were considered eligible if they met the following requirements: The inclusion criteria were as follows: (a) original, peer-reviewed research published in English; (b) a focus on nurses' cohorts; and (c) a review of Nomophobia-related features among nurses. Studies with fewer than 50 participants, duplicate cohorts, and those lacking sufficient individual-level data on nurses or unavailable through all useful approaches were excluded, as were case-control studies, case reports, editorials, commentaries, clinical practice guidelines, opinions, and reviews also.

Codification of the findings. Two reviewers gathered data separately using a Microsoft Excel file with established data extraction parameters. The retrieved data contained: Study features include the title, journal, author(s), publication year, country, study methodology, nomophobia measuring tool, and risk of bias assessment; (ii) At the study level, participant information includes age (mean, standard deviation, or range) and gender (male/female ratio); (iii) Key data: sample size, nomophobia features such as prevalence, mean and standard deviation of nomophobia scores, nomophobia categories, and quality of evidence were all investigated. A third reviewer settled disagreements about inclusion or exclusion criteria. If necessary, information was not found in the research, attempts were made to contact the authors via email.

Risk of Bias. The methodological rigor of prevalence studies was rated separately by two researchers using the Joanna Briggs Institute Critical Appraisal Tool.[19] A third author rectified the discrepancies. This evaluation tool consists of nine items with response possibilities of "yes," "no," or "unclear" if insufficient data prohibited a definitive conclusion concerning the issue. Each conforming item was given one point, whereas non-compliance or ambiguous replies earned zero points. Methodological quality was measured using the total score, with values of 0-3 indicating low quality, 4-6 moderate quality, and 7-9 excellent quality in the prevalence analysis of bias risk.

Statistical Analysis. We used a meta-analysis to determine the overall prevalence and severity of nomophobia among nurses. A random-effects model was used, with 95% confidence intervals (CIs). The Cochrane Q statistic and I^2 test were used to examine heterogeneity and its origins. Subgroup analyses were carried out according to country. All statistical analyses were carried out using R software (version 4.2.3). The "metaprop" and "metamean" functions in R (version 4.2.3) were used to calculate the pooled prevalence and general mean of nomophobia among nurses, respectively.

Subgroup Analysis. A country-specific subgroup analysis was performed to determine the prevalence of nomophobia among nurses.

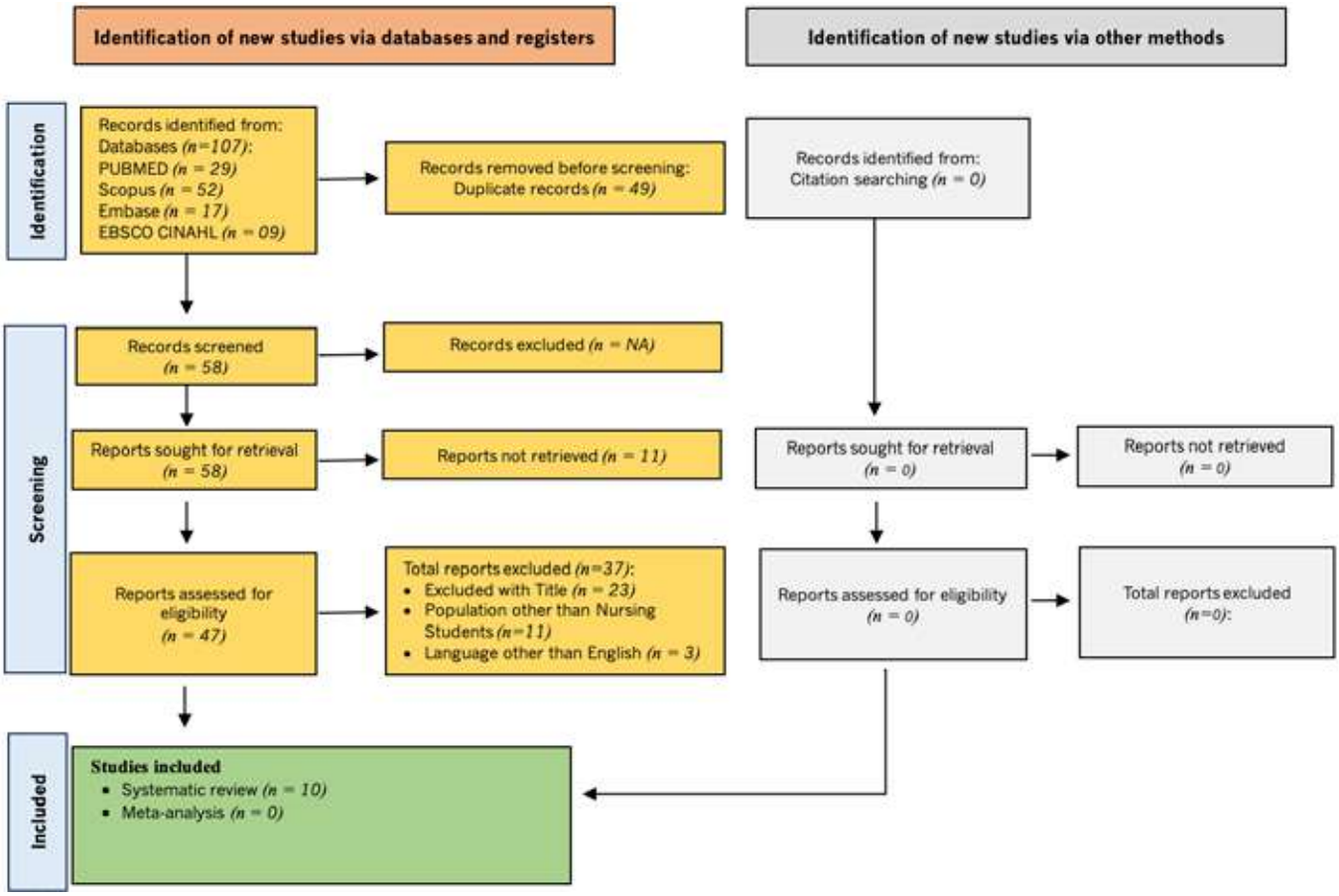

Figure 1. PRISMA flow Diagram

Publication Bias. The primary outcome was not evaluated for publication bias due to the small number (<10) of research articles included in the systematic review and meta-analysis.

Results

Search results. The initial database search yielded 107 research articles. After deleting duplicate entries, we identified 58 unique researches. Following a full-text evaluation of 47 papers, 10 satisfied the inclusion criteria. Furthermore, no other studies were found by reference filtering. As a result, the systematic review comprised ten research articles (see Figure 1).

Baseline characteristics of included studies. Ten studies with a total of 3,086 individuals were taken into consideration (Table 1). In terms of nations represented, six studies were done in Turkey[11,16,20-23] and four in Italy([12-15] Participants' average ages ranged from 28.4 to 41.2 years. In terms of nomophobia classification, nine studies([11,13-16,20-23] used mean and standard deviation to assess overall nomophobia levels, while five studies[11,13-16] divided nomophobia into four groups (absent: 20; mild: 21-59; moderate: 60-99; severe: 100-140), and one study[12] used statistical methods to categorize nomophobia (NMP-Q) into a five-point scale ranging from 1-5, which was not included in the meta-analysis.

Pooled prevalence of nomophobia in nurses. A meta-analysis was carried out on five studies that reported the prevalence of nomophobia among nurses, using established cut-off points to classify the condition as mild, moderate, and severe.[11,13-16] The prevalence of mild nomophobia was 43% (95% CI, 20%-70%; I^2 = 99%). The subgroup analysis by country indicated that the pooled prevalence of mild nomophobia among nurses residing in Italy (54% [95% CI 12%–91%; I^2 = 98%, P <0.01]) was greater than that among nurses living in Turkey. The pooled prevalence of moderate nomophobia was 31% (95% CI, 14%-56%; I^2 = 99%). Subgroup analysis revealed that nurses in Turkey had a greater moderate level of nomophobia (41% [95% CI, 0%-100%; I^2 = 98%]) than those in Italy. The prevalence of severe nomophobia was 5% (95% CI, 0%-42%; I^2 = 93%). Nurses in Turkey had a greater prevalence (11% [95% CI, 0%-99%; I^2 = 94%]) than in Italy. The meta-analysis repeatedly showed high heterogeneity (Figures 2, 3 and 4)

Table 1. Summary table of studies included in the systematic review on prevalence and severity of nomophobia among nurses

Author & year	Country	Design	Scale	Participants characteristics				Findings	Methodological quality
				N	Male	Female	Age (mean ± SD)		
Bülbüloğlu *et al.* (2019)	Turkey	The descriptive and cross-sectional design	NMP-Q	304	109	205	Not reported	The Nomophobia total score was 60.77 ± 15.09.	Moderate quality
Cetin *et al.* (2019)	Turkey	The descriptive and correlational research	NMP-Q	284	66	218	29.50±5.76	The Nomophobia total score was 90.09 ± 28.47.	High quality
Demirel *et al.* (2022)	Turkey	The descriptive and relationship-seeking design	NMP-Q	285	50	235	29.67±7.62	The Nomophobia total score was 77.65 ± 25.76.	High quality
Frassini *et al.* (2021)	Italy	A cross-sectional quantitative descriptive study	NMP-Q	139	34	105	41.2 ± 10.2	The Nomophobia total score was 79.3 ± 30.7. **Nomophobia categories** Mild 25.2% (n=35) Moderate 48.2% (n=67) Severe 25.2% (n=35)	Moderate quality
Hoşgör et al. (2021)	Turkey	The descriptive study	NMP-Q	178	18	160	30.54 ± 7.30	The Nomophobia total score was 50.8 ± 17.26. **Nomophobia categories** Mild 37.6% (n=67) Moderate 25.2% (n= 45) Severe 5.1% (n=9)	Moderate quality
Kapikiran *et al.* (2023)	Turkey	The descriptive and cross-sectional design	NMP-Q	186	38	148	33.37 ± 7.15	The Nomophobia total score was 66.64 ± 25.36.	High quality
Lupo *et al.* (2020)	Italy	Transversal and observational multicentre study	NMP-Q	539	144	395	33.8 ±13.11	The Nomophobia total score was 50.34 ± 29.032. **Nomophobia categories** Mild nomophobia 66.2% (n=347) Moderate nomophobia 21% (n=110) Severe nomophobia 6.9% (n=36)	Moderate quality
Marletta *et al.* (2021)	Italy	Observational and descriptive study	NMP-Q	72	Not reporter	Not reported	Not reported	The Nomophobia total score was 2.67 ± 1.15.	Moderate quality
Uguz *et al.* (2021)	Turkey	The descriptive, cross-sectional, and correlational study.	NMP-Q	669	115	554	28.40 (6.54)	The Nomophobia total score was 78.17 ± 22.58. **Nomophobia categories** Mild 20.9% (n=140) Moderate 59.2% (n=396) Severe nomophobia 19.4% (n=130)	Moderate quality
Vitale *et al.* (2023)	Italy	The cross-sectional, and analytical	NMP-Q	430	105	325	37 ± 12	The Nomophobia total score was 60.03 ± 26.60. **Nomophobia categories** Mild 71.6% (n=308) Moderate 13.5% (n=58) No respondents record severe nomophobia levels.	Moderate quality

NMP-Q- Nomophobia Questionnaire

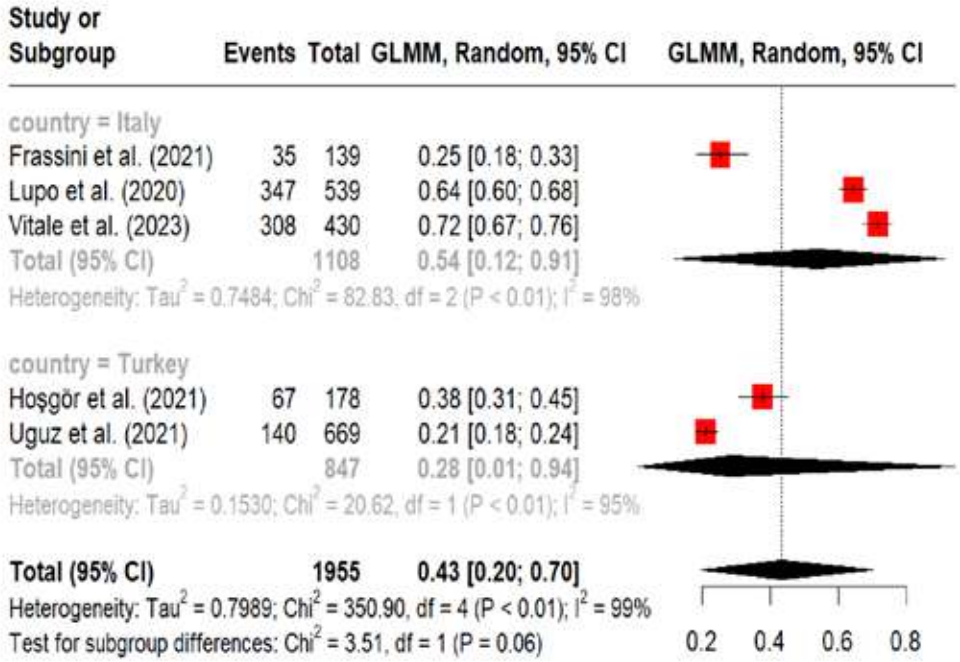

Figure 2. Forest plot, Mild Nomophobia in Nurse's (Meta-Analytical Estimation)

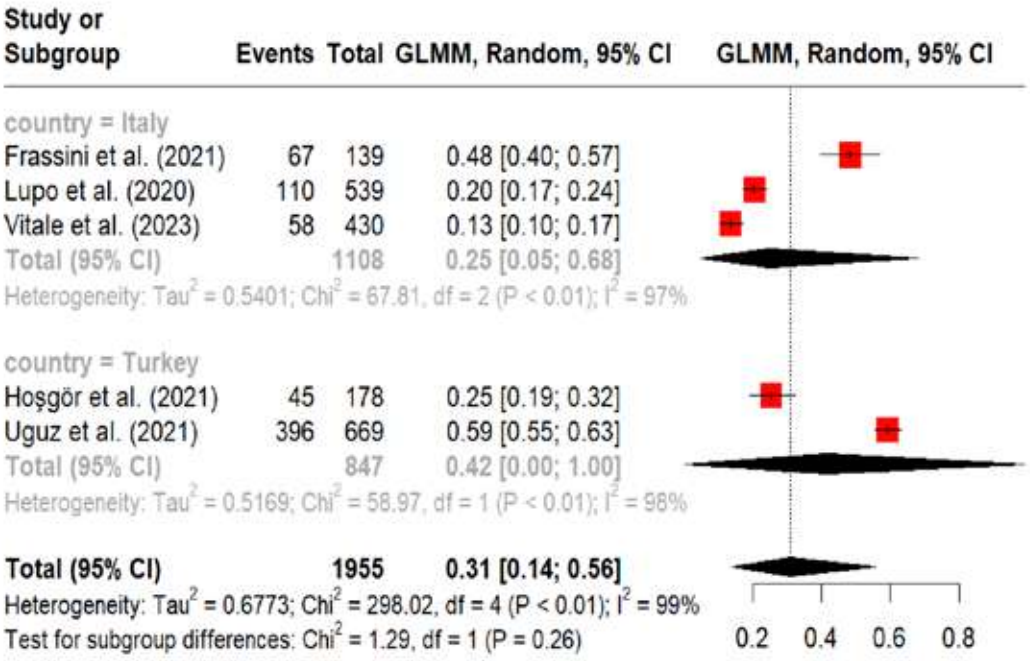

Figure 3. Forest plot, Moderate Nomophobia in Nurses (Meta-Analytical Estimation)

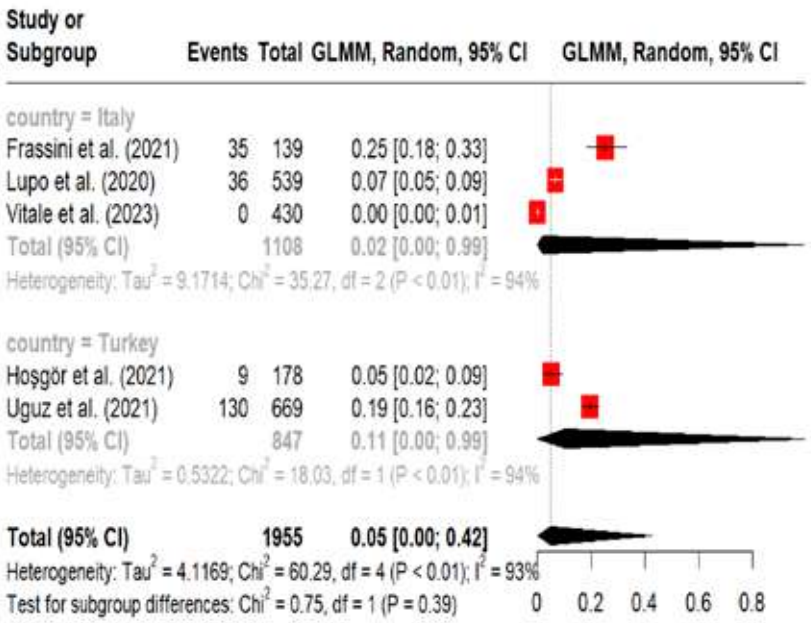

Figure 4. Forest plot, Severe Nomophobia in Nurses (Meta-Analytical Estimation).

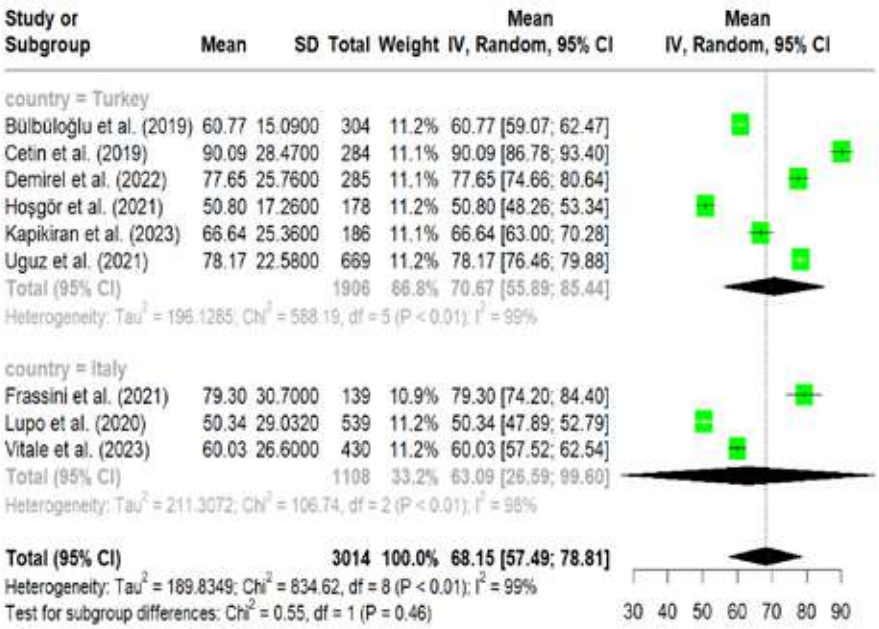

Figure 5. Forest plot, Overall Nomophobia in Nurses (Meta-Analytical Estimation)

Overall mean of nomophobia in nurses. A meta-analysis shown in figures 5 was performed on nine studies that reported the mean nomophobia score in nurses.[11,13-16,20-23] The average score for nomophobia was 68.15 (95% CI, 57.49-78.81; I^2 = 99%). Subgroup analysis based on nations revealed that the Turkish nurses had a higher mean score of nomophobia (70.67 [95% CI -55.89-85.44; I^2 = 99%, P <0.01]) than Italian nurses (63.09 [95% CI - 26.59-99.60; I^2 = 98%, P <0.01].

Risk of Bias. The JBI scores in the included reports ranged between 5 to 7. Seven of the 10 studies have been categorized as moderate quality, with three categorized as high quality. There were no reports categorized as low quality. Supplementary file S4 offers complete scores for all included studies.

Publication bias. The primary outcome was not evaluated for publication bias due to the small number (<10) of research articles included in the systematic review and meta-analysis. This limited numbers of research articles hindered the ability to adequately assess publication bias.

Discussion

Smartphones provide a variety of features to meet users' everyday requirements, including communication, scheduling, online surfing, social networking, and entertainment.[24,25] Despite the benefits, excessive smartphone usage can cause psychological distress, especially among youths. This reliance on mobile technology has raised concerns about its impact on mental and physical health, with severe cases of nomophobia, which is defined as fear and anxiety when separated from technology, being linked to an increased risk of depression, anxiety, stress, musculoskeletal issues, and even the vehicular accidents.[26,27] In today's smartphone-dependent world, Nomophobia, or the dread of being without a mobile device, causes people to keep their phones nearby at all times, even when sleeping, and often carry multiple devices or chargers as a backup. This fear has been linked to a variety of mental health problems, including stress, sleeplessness, anxiety, depression, and personality disorders, as well as low self-esteem, all of which have an influence on cognitive and motor skills.[1, 26] To the best of the authors' knowledge, this is one of the first attempts to perform a systematic review and meta-analysis to determine the prevalence of nomophobia among nurses. The purpose of this research aims to determine the prevalence of nomophobia among nurses and investigate its ramifications in order to inform initiatives targeted at encouraging safe smartphone usage among prospective nurses and other healthcare practitioners.

Though, we could not retrieve meta-analysis on this topic to discuss our findings therefore we compared the finding of the present study with other similar type of studies. The studies featured, predominantly from 2020, used quantitative and cross-sectional methodologies, mostly in an exploratory stage. We found a significant severity of nomophobia among nurses, with 68.15% feeling it to some extent, indicating its pervasive impact. Turkey was identified as the major source of research throughout the country-specific evaluation. The symptoms intensity varied, with 43% reporting mild symptoms, 31% moderate, and 7% severe, in line with previous study findings.[9,26]

The remarkable heterogeneity among the researches is an important note in the findings. This variance may be due to a variety of factors, including differences in research design, geographical contexts, and cultural inequalities amongst the study populations. Notably, differences in smartphone usage patterns, technological availability, and social attitudes toward smartphone may impact the prevalence and severity of nomophobia in different nations. Particularly, there were geographic variations, with Turkish nurses showing more severity of nomophobia than their Italian counterparts. These discrepancies highlight the need of considering sociocultural influences when

assessing nomophobia. Furthermore, the majority of research were done during and following COVID-19, indicating a probable association between increased smartphone usage and nomophobia.

It is of the utmost importance for healthcare organizations to emphasize the development of policies and resources aimed at encouraging appropriate smartphone use among nurses. This includes initiatives such as educational programs to raise awareness about the risks associated with excessive smartphone use, the development of clear guidelines governing smartphone use in clinical settings, and the provision of supportive services to individuals struggling with technology addiction. By implementing these methods, institutions may actively reduce the negative impacts of nomophobia while also promoting general well-being among nurses. These measures are essential for ensuring a healthy balance between technology integration and professional obligations in the healthcare context.[27,28] The findings of this systematic review highlight the significant prevalence and severity of nomophobia among nurses, emphasizing the need for additional research and tailored interventions in this area. A better understanding of the factors that contribute to nomophobia and its consequences in health care setting enables Nurse manager to effectively implement preventive measures.

Our study's key strength is that it does subgroup analysis based on nation, providing useful insights into the variations in nomophobia prevalence and severity among nurses across different geographic locations. This approach broadens our awareness of the importance of social factors in explaining technological behaviours. The result of this systematic review and meta-analysis will be considered with following limitation. 1) Despite efforts to search different databases, only publications from two countries were found, indicating a lack of regional representation. 2) Our review only included research published in English. 3) There is significant variation despite the consistent use of NMP-Q cut-off points for nomophobia severity categorization, with one research excluded due to non-standardized cut-offs.

Conclusion. The systematic review highlights a significant prevalence of nomophobia among nurses, with varying degrees of severity across two nations. This diversity suggests that a universal solution may not suffice, highlighting the need for tailored measures to address nomophobia effectively among nurses, considering specific circumstances and demographics.

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Repercussions of neck pain on the quality of life of health professionals in Intensive Care Units

Original Article

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Repercussions of cervical pain on the quality of life of health professionals in Intensive Care Units

Abstract

Objective. To analyze the repercussions of neck pain on the quality of life of health professionals in intensive care units. **Methods.** Cross-sectional, descriptive and correlational study, carried out with 94 health professionals (21 nurses, 13 physical therapists and 60 nursing technicians) in Intensive Care Units of two medium-sized hospitals in a municipality in the far south of Brazil. An instrument containing variables of sociodemographic and work environment characterization was applied; the Neck Bournemouth Questionnaire (NBQ) and the WHOQOL-Bref were applied. **Results.** There was a predominance of female professionals (88.3%), white (78.8%), aged 30 to 39 years (34.1%), with family income between one and two minimum wages (31.9%) and weekly workload between 31 and 40 hours (67%), night shift (54.3%), time of professional experience of one to five years (38.3%) and one job (73.4%). Neck pain and disability showed significant negative correlations with quality of life. The relationship was weak with the physical (r: -0.218; $p=0.035$) and psychological (r: -0.280; $p=0.006$) domains, and moderate with social relationships (r: -0.419; $p<0.001$), environment (r: -0.280; $p<0.001$) and general quality of life (r: -0.280; $p<0.001$). Overall quality of life showed a moderate correlation with the feeling of anxiety (r: -0.431; $p<0.001$) and depression (r: -0.515; $p<0.001$) of professionals in the last week. **Conclusion.** Neck pain caused repercussions in the physical, psychological, social, environmental and general quality of life of health professionals in intensive care units.

Descriptors: neck pain; quality of life; health professionals; intensive care units; occupational health.

Repercusiones del dolor cervical en la calidad de vida de los profesionales sanitarios de las Unidades de Cuidados Intensivos

Resumen

Objetivo. Analizar las repercusiones del dolor cervical en la calidad de vida de los profesionales sanitarios de las unidades de cuidados intensivos**.** **Métodos.** Estudio transversal, descriptivo y correlacional de 94 profesionales de la salud (21 enfermeros, 13 fisioterapeutas y 60 técnicos de enfermería) de las unidades de cuidados intensivos de dos hospitales de tamaño medio de un municipio del extremo sur de Brasil. Se aplicó un instrumento que contenía variables sociodemográficas y de caracterización del ambiente de trabajo; el Cuestionario Neck Bournemouth (NBQ) y el WHOQOL-Bref. **Resultados.** Hubo predominio de profesionales del sexo femenino (88.3%), raza blanca (78.8%), edad entre 30 y 39 años (34.1%), con renta familiar entre uno y dos salarios mínimos (31.9%); una carga horaria semanal

entre 31 y 40 horas (67%), turno nocturno (54.3%) y años de trabajo entre uno y cinco años (38.3%) y tienen un solo empleo (73.4%). El dolor cervical y las incapacidades laborales mostraron correlaciones negativas significativas con la calidad de vida: la relación fue débil con los dominios físico (r: -0.218; p=0.035) y psicológico (r: -0.280; p=0.006), y moderada con las relaciones sociales (r: -0.419; p<0.001), el entorno (r: -0.280; p<0.001) y la calidad de vida general (r: -0.280; p<0.001). La calidad de vida global mostró una correlación moderada con los sentimientos de ansiedad (r: -0.431; p<0.001) y depresión (r: -0.515; p<0.001) de los profesionales en la última semana. **Conclusión.** El dolor cervical repercute en la calidad de vida física, psicológica, social, ambiental y general de los profesionales sanitarios de las unidades de cuidados intensivos.

Descriptores: dolor de cuello; calidad de vida; personal de salud; unidades de cuidados intensivos; salud laboral.

Repercussões da dor cervical na qualidade de vida de profissionais de saúde de Unidades de Terapia Intensiva

Resumo

Objetivo. Analisar as repercussões da dor cervical na qualidade de vida de profissionais de saúde de unidades de terapia intensiva. **Métodos.** Estudo transversal, descritivo e correlacional, realizado com 94 profissionais de saúde (21 enfermeiros, 13 fisioterapeutas e 60 técnicos em enfermagem) em Unidades de Terapia Intensiva de dois hospitais de médio porte de um município do extremo sul do Brasil. Foi aplicado um instrumento contendo variáveis de caracterização sociodemográfica e do ambiente de trabalho; o *Neck Bournemouth Questionnaire (*NBQ*)* e o WHOQOL-Bref. **Resultados.** Houve predomínio de profissionais do sexo feminino (88.3%), brancos (78.8%), na faixa etária de 30 a 39 anos (34.1%), com renda familiar entre um e dois salários-mínimos (31.9%) e carga horária de trabalho semanal entre 31 e 40 horas (67%), turno de trabalho noturno (54.3%), tempo de atuação profissional de um a cinco anos (38.3%) e um emprego (73.4%). A dor cervical e incapacidade mostraram correlações negativas significativas com a qualidade de vida. A relação foi fraca com os domínios físico (r: -0.218; p=0.035) e psicológico (r: -0.280; p=0.006), e moderada com relações sociais (r: -0.419; p<0.001), meio ambiente (r: -0.280; p<0.001) e qualidade de vida geral (r: -0.280; p<0.001). A qualidade de vida geral apresentou correlação moderada com o sentimento de ansiedade (r: -0.431; p<0.001) e de depressão (r: -0.515; p<0.001) dos profissionais, na última semana. **Conclusão.** A dor cervical causou repercussões nos domínios físico, psicológico, social, meio ambiente e na qualidade de vida geral dos profissionais de saúde das unidades de terapia intensiva.

Descritores: dor cervical; qualidade de vida; profissionais de saúde; unidades de terapia intensiva; saúde ocupacional.

Introduction

Neck pain is a multifactorial condition, which proves to be a public health problem of modern society, especially of health professionals, who deal with the pain of patients, often neglecting their own pain. Although it is not the most prevalent disorder among the population, it is usually in great demand and has a direct impact on work and productivity, in addition to life outside the work environment.[1] According to the Global Burden of Disease (GBD) study, neck pain was classified as the third reason for years lived with disability among the young population, aged between 20 and 24 years.[2] A review study showed that psychosocial factors involving stress, anxiety, depression, kinesiophobia, low satisfaction and high work overload can negatively influence neck pain.[1] As it is a complex and recurrent disorder, it has a strong tendency to chronicity, tending to generate pain, limitation of activities of daily living, incapacity for work activities and reduced Quality of Life (QoL).[3,4]

Quality of life can be defined as the individual's perception of his position in life, in the context of the culture and value system in which he lives, and in relation to his goals, expectations, standards and concerns, and can be evaluated in various ways.[5,6] Among the various QoL assessment instruments, the abbreviated version of the WHOQOL-Bref has been widely used, as it is easy to apply and addresses physical, psychological, social and environmental aspects, as well as general quality of life.[5] The main causes of pain among health professionals are occupational etiology, resulting from movements of the upper limbs at inadequate angulations, excessive and compensatory efforts.[1,7,8] Neck pain caused by musculoskeletal disorders related to the work environment, such as repetitive movements and neck maintenance in static postures, for long periods of time can interfere with the quality of life of these professionals.[1]

It is common for health professionals in Intensive Care Units (ICU) to face high physical and psychological work demands, resulting from the physical deficiencies of the work environment, the lack of Personal Protective Equipment (PPE) and the lack of professionals qualified for the job.[9] Dealing with issues of anxiety, depression and post-traumatic stress during the pandemic is a fact linked to neck pain, in addition to being a factor that can trigger them.[1,10] In addition, studies show that neck pain arising from the work process was potentiated during the COVID-19 pandemic period, which contributed to the increase in psychological disorders in the workplace.[1,9,10] Although there are studies on neck pain, quality of life and work environment, the approach does not occur in an integrated way, generating a gap in knowledge about the repercussions of neck painful processes on quality of life and its relationship with the work environment in health professionals of Intensive Care Units. In this context, the research question arose: What is the relationship of neck pain in the

QoL of professionals working in intensive care units? To answer it, the objective of the study was established: to analyze the repercussions of neck pain on the quality of life of health professionals in intensive care units.

Methods

This is a cross-sectional, descriptive and correlational study, from the macroproject "Work process and health of clinical-occupational workers in different socio-environmental contexts and age groups", developed between April and August 2023, in Intensive Care Units of two medium-sized hospitals in a municipality in the far south of Brazil, being: (i) a university hospital, which has an adult ICU composed of six beds intended only for the care of patients in the public health system, the Unified Health System (SUS); (ii) a philanthropic hospital, which mostly serves patients from the SUS, but provides care for private patients and the supplementary health network (medical insurance). This hospital has a general ICU with seven intensive and three semi-intensive beds, for SUS care; a Postoperative Intensive Unit with nine beds, for the care of patients in the postoperative period of cardiac surgery and general cardiological care; and a general ICU with ten beds, for the care of private and affiliated patients.

The study population consisted of nurses, physical therapists or nursing technicians from therapy units who had been working in health institutions for at least two months, which is the average period of adaptation of workers to organizational dynamics.[11] Professionals who, even meeting the inclusion criteria, were on vacation or on sick leave during the data collection period were excluded from the study. The population eligible for the study consisted of 124 professionals: 29 nurses (10 from the university hospital; 19 from the philanthropic hospital), 73 nursing technicians (21 from the university hospital; 52 from the philanthropic hospital) and 22 physical therapists (7 from the university hospital; 15 from the philanthropic hospital). All eligible professionals were invited to participate in the study and the sample was constituted by convenience. However, to ensure the representativeness of the professionals, the sample size was calculated using StatCalc Epi Info version 7.2. The 95% confidence level and the 5% margin of error were adopted, obtaining the sample size of 94 professionals.

For data collection, carried out from April to August 2023, a self-administered instrument composed of three parts was used, being: a) a sociodemographic questionnaire and characteristics of the work environment: built based on studies by the Reference Center for Occupational Health of Bahia de Ilha Grande.[12] This questionnaire was composed of independent variables (professional category, sex, age, skin color, family income, work shift, hours worked, time of professional experience, number of jobs and if you have ever suffered an accident at work) and characteristics of the work environment (professionals' assessment of the volume of work; and conditions of furniture, equipment and physical space); b) the Neck Bournemouth Questionnaire (NBQ), used to assess aspects related to the level of pain and cervical disability. The version validated in Brazil by Kamonseki *et al.*[13] has seven questions, with answers on a numerical scale ranging from zero (lowest intensity) to 10 (maximum intensity). The seven questions of the instrument are distributed to score the level of neck pain (NBQ1), how much pain impaired daily activities (NBQ2), the impairment of recreational and leisure activities (NBQ3), feelings of anxiety, tension, irritability (NBQ4), feeling of sadness and depression (NBQ5), worsening of neck pain during activities in the last week (NBQ6) and the way the participant managed pain properly (NBQ7); and c) the WHOQOL-bref, validated in Brazil by Fleck[14] and used to assess quality of life. The instrument presents 26 questions, with answers on a five-point Likert scale, which comprise five domains: physical (covers pain and discomfort, energy and fatigue, sleep and rest, activities of daily life, dependence on medication or treatments, work capacity); psychological (it

includes positive feelings, thinking, learning, memory and concentration, self-esteem, body image and appearance, negative feelings, spirituality, religiosity and personal beliefs); social relationships (it involves personal relationships, social support and sexual activity); environment (it considers physical safety and protection, home environment, financial resources, health and social care, recreation/leisure, physical environment), in addition to general quality of life (general QoL).[14]

To verify that the questionnaires did not present possible misunderstandings, a pilot study was carried out with eight professionals from one of the work shifts. As there was no need for semantic and structural reformulation, the professionals who participated in the pilot study were included in the final sample. The application of the research instruments was conducted by a physical therapist with professional experience in the ICU. Professionals were invited to participate in the study through an informative text sent in the ICU WhatsApp groups by the technical managers of each unit. The professionals were also approached in person by the researcher and invited to fill out the study questionnaire. The distribution of the questionnaires was carried out by work shift, in each of the units. Three attempts were made on different days, in order to find the professionals who, perhaps, had not been approached. The professionals answered the questions in the workplace. The mean application time was approximately 30 minutes. In case of unavailability due to complications in the unit, the professionals were allowed to answer the instruments at another time, outside the work environment, with prior guidance from the researcher and the return of the completed instruments at the next visit of the researcher to the unit. In addition, the researcher's contact was made available to clarify doubts. Four professionals formally refused to participate in the study.

The data obtained were tabulated in the Statistical Package for the Social Science (SPSS), version 28.0. The assessment of data normality was performed using the Kolmogorov-Smirnov test. To assess the level of pain and cervical disability, the scores of all questions on the Neck Bournemouth Questionnaire were summed, resulting in a value from zero to 70, considering that the higher the score obtained, the higher the level of pain and cervical disability.[13] To calculate the *WHOQOL*-bref results, the scores for each domain were calculated, considering: (i) physical domain: (Mediax6 (Q3+Q4+Q10+Q15+Q16+Q17+Q18)) x4; (ii) psychological domain: Mediax5 (Q5+Q6+Q7+Q11+Q19+Q26))x4; (iii) social relations domain: (Mediax2 (Q20+Q21+Q22)) x4; (iv) environmental domain: (Mediax6 (Q8+Q9+Q12+Q13+Q14+Q23+Q24+Q25)) x4. Then, the obtained scores were converted to a scale from 0 to 100 using the formula [(Mean - 4) × 100/16]. The higher the scores, the better the assessment of quality of life.[14]

For the descriptive analysis, central tendency measurements (mean and median) and dispersion measurements (standard deviation and interquartile range) were performed, according to data distribution. After describing the absolute and relative frequencies, the means were compared using analysis of variance (ANOVA). To evaluate the correlation between the variables, the *Spearman* Correlation test was applied. The interpretation of the correlation was classified as weak for r values up to 0.399, moderate for values between 0.400 and 0.699, and strong for values equal to or greater than 0.700.[10] All analysis adopted a significance level of 5%.

The study was approved by the Institution's Research Ethics Committee under Certificate of Presentation of Ethical Appreciation number 63105722.2.0000.5324. Before data collection, participants were informed about the purpose of the study and signed the Informed Consent Form.

Results

The study included 94 health professionals, 28 (29.8%) from the university hospital and 66 (70.2%) from the philanthropic hospital. Among the professionals assessed, 21 (22.4%) were nurses, 60 (63.8%) nursing technicians and 13 (13.8%) physical therapists. As shown in Table 1, there was a predominance of females (88.3%), white skin color (78.8%), age group from 30 to 39 years (34.1%), and family income between one and two minimum wages (31.9%), weekly workload between 31 and 40 hours (67.0%), night shift (54.3%), time of professional experience from one to five years (38.3%) and with only one job (73.4%).

Table 1. Sociodemographic and professional characteristics of health workers in Intensive Care Units. Rio Grande, RS, 2023. (*n*=94)

Variables	*n*	%
Work institution		
University Hospital	28	29.8
Philanthropic Hospital	66	70.2
Professional Category		
Nurse	21	22.3
Nursing technician	60	63.8
Physical therapist	13	13.8
Sex		
Male	11	11.7
Female	83	88.3
Skin color		
White	74	78.8
Black and brown	20	21.2
Age group		
20 to 29 years	25	26.6
30 to 39 years	32	34.1
40 to 50 years	31	33.0
Over 50 years	6	6.4
Monthly family income		
1 to 2 minimum wages	30	31.9
2 to 3 minimum wages	22	23.4
3 and ≤ 5 minimum wages	23	24.5
5 and ≤ 20 minimum wages	20	20.2
Weekly workload		
≥ 20 and ≤ 30 hours	18	19.1
≥ 31 and ≤ 40 hours	57	67.0
> 40 hours	13	13.8
Work Shift		
Daytime	43	45.7
Nighttime	51	54.3

Table 1. Sociodemographic and professional characteristics of health workers in Intensive Care Units. Rio Grande, RS, 2023. (*n*=94) (Cont.)

Variables	*n*	%
Time of experience in the profession		
≤ 12 Months	9	9.6
One to five years	36	38.3
Six to ten years year;	15	16.0
> 10 years	34	36.2
Number of Jobs		
One	96	73.4
Two	21	22.3
Three	4	4.3
Has been through work accidents		
Yes	33	35.1
No	61	64.9

**Minimum wage amount: R$1320.00 ≈ USD 264.05 (1 USD = R$4.9997)*

Data on the work environment were described through qualifiers, in which 61.7% of the professionals evaluated that there is a condition of overload in relation to the volume of service. The furniture of the work sector was considered in unsatisfactory conditions (regular, bad or very bad) by 61.7% of the professionals. Although the percentage of professionals who consider work sector equipment as excellent or good (48.9%), for more than 50% of professionals, these equipment have regular or poor conditions (Table 2).

Table 2. Characteristics of the work environment of health workers in Intensive Care Units. Rio Grande, RS, 2023. (*n*=94)

Variables	*n*	%
How do you evaluate the volume of work?		
Light	1	1.1
Moderate	35	37.2
There is an overload	49	52.1
Exhaustive	9	9.6
How do you evaluate the furniture in your work sector?		
Excellent	2	2.1
Good	34	36.2
Regular	46	48.9
Bad	11	11.7
Very bad	1	1.1
How do you evaluate the equipment in your work sector?		
Excellent	4	4.2
Good	42	44.7
Regular	42	44.7
Bad	1	1.1

The analysis of the Neck Bournemouth Questionnaire (Table 3) showed that there was no statistical difference in the mean scores obtained by each professional category ($p>0.05$). It is noteworthy, however, that the professionals obtained higher scores in the questions referring to the presence of anxiety (question 4) and neck pain (question 1) in the last week.

Table 3. Scores for the questions of the Neck Bournemouth Questionnaire, according to the professional category of workers in the Intensive Care Units. Rio Grande, RS, 2023. (*n*=94)

Scores for the Neck Bournemouth Questionnaire	Nurses	Nursing Technicians	Physical therapists	*p*-value
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	
1. What was your level of neck pain	5.3 (4.1 – 6.5)	4.3 (3.6 – 5.1)	3.6 (1.8 – 5.4)	0.198
2. How much did your neck pain impair your daily activities (Homework, bathing, putting on clothes, getting up, reading and driving)	4.1 (2.8 – 3.8)	3.0 (2.3 – 3.8)	2.8 (0.9 – 4.7)	0.307
3. How much did your neck pain affect your recreational, social and family activities?	3.6 (2.5 – 4.8)	2.7 (2.0 – 3.4)	2.1 (0.3 – 3.9)	0.232
4. Did you feel anxious (tense, nervous, irritable, having difficulty concentrating/ relaxing)?	6.3 (4.9 – 7.6)	6.1 (5.3 – 6.9)	4.8 (2.8 – 6.8)	0.317
5. Did you feel depressed (“down”, sad, pessimistic, and unhappy)?	4.6 (3.0 – 6.1)	4.4 (3.5 – 5.3)	3.8 (1.8 – 5.7)	0.794
6. How much has your neck pain gotten worse, (or could it have gotten worse) with work both outside and at home?	4.5 (3.3 – 5.8)	3.4 (2.6 – 4.1)	3.2 (1.0 – 5.5)	0.283
7. How much have you been able to control (reduce) your neck pain on your own?	3.9 (2.8 – 5.0)	3.1 (2.4 – 3.7)	1.3 (0.5 – 3.3)	0.079

The evaluation of the level of pain and cervical disability, based on the analysis of the NBQ score in percentiles, revealed that 27 (28.7%) professionals had a score ≤ 14 points (1st percentile); 43 (54.8%) had a score > 14 and < 75 points (2nd percentile); and 24 (25.5%) professionals had a score ≥ 75 points (3rd percentile). The latter are the ones with the highest level of pain and cervical disability, being: 7 (29.2%) nurses, 14 (58.3%) nursing technicians and 3 (12.5%) physical therapists. Figure 1 shows the analysis of the overall NBQ score, by professional category.

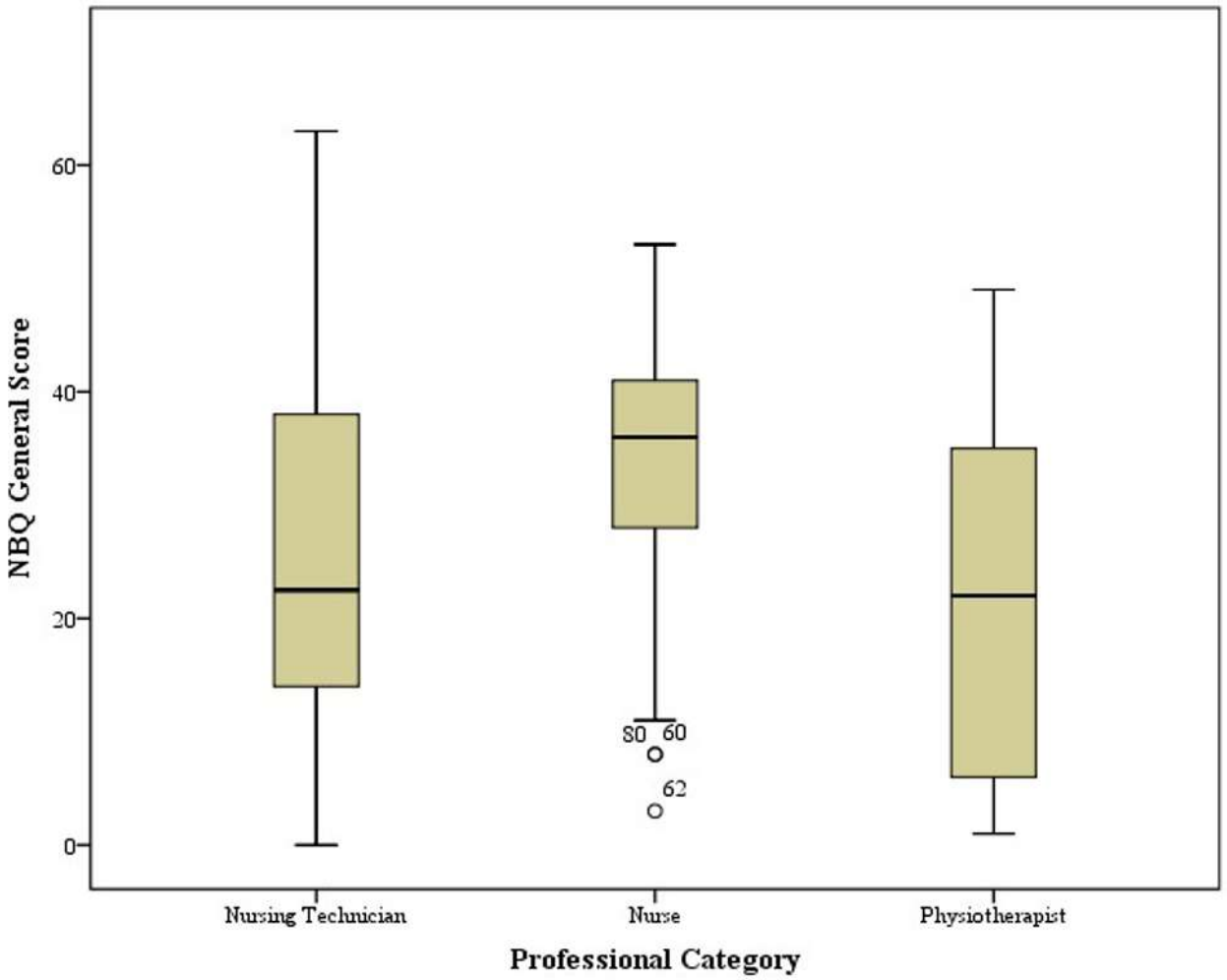

Figure 1. General score of the Neck Bournemouth Questionnaire, according to the professional category of workers in the Intensive Care Units. Rio Grande, RS, 2023. (n=94)

Regarding the evaluation of quality of life, the professionals had a lower score in the physical domain (55.2 points) and a higher score in the social relationships domain (68.1points). Nurses had a significantly lower score than other professionals in the physical domain and nursing technicians had a significantly higher score than other professionals for overall quality of life (Table 4).

Table 4. Mean WHOQOL-Bref scores of workers in Intensive Care Units. Rio Grande, RS, 2023. (n=94)

WHOQOL-bref DOMAINS	Nurses	Nursing Technicians	Physical therapists	**Total**	***p*-value**
	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	Mean (95% CI)	
Physical	50.9 (46.8 – 54.9)	57.3 (54.9 – 59.6)	52.7 (47.7 – 57.8)	55.2 (47.7 – 57.8)	0.010
Psychological	60.1 (56.4 – 63.8)	63.0 (59.9 – 66.0)	61.9 (54.7 – 69.0)	62.2 (59.9 – 64.5)	0.595
Social Relationships	63.9 (57.1 – 70.6)	68.8 (64.0 – 73.5)	71.8 (57.8 – 85.8)	68.1 (64.3 – 71.9)	0.435
Environment	52.5 (46.7 – 58.4)	61.2 (58.1 – 64.3)	58.9 (47.8 – 70.0)	58.9 (56.2 – 61.7)	0.039
Overall QoL	55.4 (52.6 – 58.2)	61.4 (59.0 – 63.9)	59.5 (52.3 – 66.6)	59.8 (57.9 – 61.8)	0.037

As shown in Table 5, there was a negative and statistically significant correlation of neck pain and disability with quality of life. There was a weak correlation between neck pain and disability and the physical (r: -0.218; $p=0.035$) and psychological (r: -0.280; $p=0.006$) domains of quality of life; and moderate correlation of neck pain and disability with the social relationships (r: -0.419; $p<0.001$) and environment (r: -0.280; $p<0.001$) and with overall quality of life (r: -0.280; $p<0.001$) domains. It is also noteworthy the moderate correlation of general quality of life with the feeling of anxiety (r: -0.431; $p<0.001$) and depression (r: -0.515; $p<0.001$) of professionals during the last week.

Table 5. Correlations between Neck Pain and Disability (NBQ) with WHOQOL-BREF DOMAINS

NBQ Questions	WHOQOL-BREF DOMAINS				
	Physical	Psychological	Social Relationships	Environment	Overall QoL
1. During the last week, what was your level of neck pain	-0.220*[a] (0.033)	-0.095[a] (0.362)	-0.259*[a] (0.012)	-0.222*[a] (0.032)	-0.242*[a] (0.019)
2. During the last week, how much has your neck pain hindered your daily activities (Homework, bathing, putting on clothes, get up, reading and driving)	-0.167[a] (0.107)	-0.244*[a] (0.018)	-0.315**[a] (0.002)	-0.363**[a] (<0.001)	-0.351**[a] (0.001)
3. During the last week, how much did your neck pain affect your recreational, social and family activities?	-0.166[a] (0.110)	-0.212*[a] (0.040)	-0.343**[a] (0.001)	-0.394**[a] (<0.001)	-0.357**[a] (<0.001)
4. During the last week, have you felt anxious (tense, nervous, irritable, having difficulty concentrating/relaxing)?	-0.220*[a] (0.033)	-0.346**[a] (0.001)	-0.339**[a] (0.001)	-0.380**[a] (<0.001)	-0.431**[b] (<0.001)
5. During the last week, have you felt depressed ("down", sad, pessimistic, unhappy)?	-0.222*[a] (0.031)	-0.449**[b] (<0.001)	-0.464**[b] (<0.001)	-0.432**[b] (<0.001)	-0.515**[b] (<0.001)
6. During the last week, how much has your neck pain gotten worse, (or could it have gotten worse) with work both outside and at home?	-0.152a (0.144)	-0.197[a] (0.057)	-0.346**[a] (0.001)	-0.358**[a] ((<0.001)	-0.339**[a] (0.001)
7. During the last week, how much have you been able to control (reduce) your neck pain on your own?	-0.103[a] (0.323)	0.003[a] (0.980)	-0.269**[a] (0.009)	-0.241*[a] (0.019)	-0.197[a] (0.057)
Total Score	-0.218*[a] (0.035)	-0.280**[a] (0.006)	-0.419**[b] (<0.001)	-0.420**[b] (<0.001)	-0.431**[b] (<0.001)

** p<0.05. **p<0.01. [a] Weak correlation; [b] Moderate correlation.*

Discussion

The study made it possible to analyze the work environment of health professionals in Intensive Care Units, examining how neck pain affects the quality of life of these workers. The results showed that neck pain has the potential to negatively impact the quality of life of the health professionals studied. Musculoskeletal pain, especially neck pain accompanied by disability, usually originates in the work environment and affects several aspects of health. They negatively impact the physical and mental health and overall quality of life of health professionals.[4,15] Nevertheless, during the pandemic period there was a mix of feelings capable of enhancing existing pains, due to the environment and work routine, or contributing to the emergence of new pains.

Workers have a higher risk of developing neck pain when facing high work demands.[7,16] As shown in the present study, the greater the volume of work felt by workers, the greater the perception of neck pain. In this sense, it is important to highlight that the units studied have different characteristics. Some attend a high turnover of patients, which can increase the physical wear of professionals. Other units deal with patients with chronic diseases, which generates additional physical and psychological demands for workers. In addition, some services focus on the conduct established only by physicians, disregarding the contribution of other professionals. The literature points to the lack of support from colleagues and the limitation in decision-making power as risk factors for the onset of neck pain.[7,16]

Another point to be highlighted is the repercussion that the volume of service perceived by workers causes in activities of daily living, leisure, social or family activities. The intensity of low back pain is associated with worse prognosis for pain relief and greater physical limitations for daily and social activities.[17] Nevertheless, neck and lower back pain can be influenced by work strain caused by work-life imbalance. The constant pressure to follow conducts that disregard multidisciplinary collaboration can generate tensions. When these stresses are combined with low pay and the need to work more than one job, professionals are more vulnerable to musculoskeletal problems. Therefore, strategies that reduce tensions in the health team can be effective in preventing these injuries.[1,17] A study with Primary Health Care professionals indicated that neck pain affected only the physical and psychological domains of quality of life.[18] In contrast, our study of intensive care unit professionals revealed that the level of neck pain was associated not only with the physical domain but also with the social, environmental, and overall quality of life domains. The association of higher levels of neck pain with lower quality of life scores observed in our study suggests a possible relationship between the complexity of the work environment and the occurrence of neck pain.

A study carried out in China showed that nursing professionals presented, primarily, pain in the back and lower limbs. In addition to estimating that more than a third of professionals reported pain reflexes in their daily lives and sleep impairments.[19] Similar results were found in the present study, where health professionals who reported greater impact of neck pain on daily activities showed a strong association with the physical domain. This domain includes the evaluation of factors such as pain and discomfort, day-to-day activities, sleep and rest.[14] Saudi health professionals presented with high-intensity neck pain when compared to symptoms of shoulder pain.[20] It is common for cervical spine pain to have a negative impact on the physical and mental health of workers. In this sense, psychological factors, such as anxiety, are responsible for worsening neck pain crises, in addition to contributing to disability and kinesiophobia. In addition, patients with neck pain crises may experience periods of anxiety.[1,21] In addition to anxiety, problems related to depressive events also contribute to neck pain, creating a bidirectional mechanism in which pain

and disability reinforce each other.[1,21] Feelings of sadness, pessimism, and unhappiness are often associated with neck pain disorders, which can lead to high morbidity.[1] However, to diagnose a depressive disorder, it is necessary for the individual to be evaluated by a mental health professional. In addition, the excessive volume of work and the lack of decision-making power make the professional feel powerless, which can result in negative consequences outside the work environment.[18]

Some osteokinematic movements, when performed excessively or sustained by long hours of work, such as cervical flexion and rotation, are associated with psychosomatic symptoms, such as anxiety, depression and Post Traumatic Stress Disorder (PTSD).[20,22] As elucidated in our study, the worsening of neck pain during work was a reality found that, in turn, compromised all domains of QoL. A meta-synthesis identified that neck pain proves to be of multidimensional phenomenology, affecting both the physical and psychological domains, as well as the social one.[23] In the present study, we observed an inverse correlation between the ability to control or reduce neck pain and quality of life, indicating that health professionals who face more difficulty in controlling pain have greater losses in the physical, social, general and environmental domains. According to the literature, there are different strategies for coping with neck pain, such as psychotherapy, pharmacological treatments, electrotherapy, dietary changes, mental health resources, lifestyle adaptations and regular practice of physical activity.[24]

A qualitative study conducted in Canada[24] showed that chronic pain represents an important factor of interference in all aspects of QoL, in addition to highlighting the importance of a clinical diagnosis, and not only strategies for coping with it. In the case of Brazil, the low remuneration received by professionals leaves them hostage to drug treatments, which are often ineffective because they do not treat the cause. This situation leads to chronic pain, which can culminate in incapacity for work. To face this problem, strategies are needed that promote the adequate sizing of professionals for the demands of health units, the availability of equipment that assists in the manual transport of cargo and the implementation of public policies for valuing and promoting the health of professionals in intensive care units.[6,25]

It is concluded that neck pain has had repercussions on several aspects of the lives of health professionals working in intensive care units, including the physical, psychological, social, and environmental and quality of life domains. The increase in pain and disability affects feelings of anxiety and depression, further contributing to the worsening of the quality of life and well-being of these professionals.

As a limitation of the study, it is noteworthy that the sample restricted to two hospital units in a municipality in southern Brazil may not capture the diversity of work environments and conditions that influence neck pain and quality of life, resulting in a reduced view of the factors involved and the dynamics of evolution of these conditions. However, the results obtained are able to support the implementation of prevention and intervention strategies that can reduce the incidence of neck pain and its consequences on the quality of life of workers, such as ergonomics and psychological support programs. In addition to directing institutional managers and professionals responsible for occupational health to make changes in the work environment and in worker support practices, aiming to improve the quality of life and well-being of these employees.

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Original Article

Validity and Reliability of the Adolescent Lifestyle Profile-Revised 2 (ALP-R2) Scale in Colombian Adolescents

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Validity and Reliability of the Adolescent Lifestyle Profile-Revised 2 (ALP-R2) Scale in Colombian Adolescents

Abstract

Objective. The study sought to determine the validity and reliability of the Adolescent Lifestyle Profile-Revised 2 (ALP-R2) scale, translated into Spanish, in Colombian adolescents. **Methods.** Psychometric study, which included the translation process (English to Spanish). The final version of the scale in Spanish was approved by Nola Pender; apparent and content validation was carried out through expert judgment (n = 6). With a sample of 1476 Colombian adolescents. Construct validity was determined through exploratory and confirmatory factor analysis. The internal consistency was calculated with Cronbach's coefficient. **Results.** Favorable evidence was obtained of apparent validity, content validity, and construct validity with a model comprised of 44 items and 7 subscales (total accumulated variance 44.9%) with good absolute

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fit ($\chi 2$: 18434.3; df = 946; $p < 0.0001$; CMIN/DF = 4.326; SRMR = 0.0562; RMSEA = 0.047), incremental (CFI = 0.834; NFI = 0.795; NNFI = 0.822) and parsimony (PCFI = 0.777; PNFI = 0.741; AIC = 4116.848). Good internal consistency in the total scale (α = 0.91) and in the subscales (α between 0.609 and 0.809). **Conclusion.** The Spanish version of the ALP-R2 scale has adequate psychometric properties of validity and reliability, to measure the lifestyle profile of Colombian adolescents, coherent with the theoretical model of Health Promotion. Its use is recommended in populations similar to that of the study.

Descriptors: adolescent; Health promotion; Psychometrics, Methodological research in nursing; Surveys and questionnaires.

Validez y confiabilidad de la escala Adolescent Lifestyle Profile-Revised 2 (ALP-R2) en adolescentes colombianos

Resumen

Objetivo. Determinar la validez y confiabilidad de la escala Adolescent Lifestyle Profile-Revised 2 (ALP-R2) traducida al español, en adolescentes colombianos. **Métodos.** Estudio Psicométrico, que incluyó el proceso de traducción (inglés a español). La versión final de la escala en español fue aprobada por Nola Pender, se le realizó validación aparente y de contenido mediante juicio de expertos (n = 6). Con una muestra de 1.476 adolescentes colombianos. Se determinó la validez de constructo mediante análisis factorial exploratorio y confirmatorio. La consistencia interna se calculó con el coeficiente alfa de Cronbach. **Resultados.** Se obtuvo evidencia favorable de validez aparente, de validez contenido y de validez de constructo con un modelo conformado por 44 ítems y 7 subescalas (varianza total acumulada 44,9 %) con buen ajuste absoluto ($\chi 2$: 18434.3; gl = 946; $p < 0.0001$; CMIN/DF = 4.326; SRMR = 0.0562; RMSEA = 0.047), incremental (CFI = 0.834; NFI = 0,795; NNFI = 0,822) y de parsimonia (PCFI = 0,777; PNFI = 0,741; AIC = 4116.848). Buena consistencia interna en la escala total (α = 0.91) y en las subescalas (α entre 0.609 y 0.809). **Conclusión.** La escala ALP-R2 versión español tiene adecuadas propiedades psicométricas de validez y confiabilidad, para la medición del perfil estilo de vida de los adolescentes colombianos, coherente con

el Modelo teórico de Promoción de la Salud. Se recomienda su uso en poblaciones similares a la del estudio.

Descriptores: adolescente; promoción de la salud; Psicometría, Investigación metodológica en enfermería; Encuestas y cuestionarios.

Validade e confiabilidade da escala Perfil de estilo de vida do adolescente revisado 2 (ALP-R2) em adolescentes colombianos

Resumo

Objetivo. Determine a validade e confiabilidade da escala Adolescent Lifestyle Profile-Revised 2. (ALP-R2) traduzido para o espanhol, em adolescentes colombianos. **Métodos.** Estudo Psicométrico, que incluiu o processo de tradução (inglês para espanhol). A versão final da escala em espanhol foi aprovada por Nola Pender e a validação de conteúdo foi realizada por meio de parecer de especialistas (n = 6). Com uma amostra de 1.476 adolescentes colombianos. A validade de construto foi determinada por meio de análise fatorial exploratória e confirmatória. A consistência interna foi calculada através do coeficiente alfa de Cronbach. **Resultados.** Evidências favoráveis de validade aparente, validade de conteúdo e validade de construto foram obtidas com um modelo composto por 44 itens e 7 subescalas (variância total acumulada 44.9%) com bom ajuste absoluto (χ 2 : 18434.3; gl = 946; $p<$ 0.0001; CMIN /DF = 4.326; Boa consistência interna na escala total (α = 0.91) e nas subescalas (α entre 0.609 e 0.809). **Conclusão.** A escala ALP-R2, versão em espanhol, possui propriedades psicométricas adequadas de validade e confiabilidade para medir o perfil de estilo de vida de adolescentes colombianos, consistentes com o Modelo teórico de Promoção da Saúde. Seu uso é recomendado em populações semelhantes à do estudo.

Descritores: adolescente; Promoção de saúde; Psicometria, Pesquisa metodológica em enfermagem; Pesquisas e questionários.

Introduction

According to the World Health Organization (WHO), adolescence is a stage of life (10 to 19 years) where behavioral patterns related to lifestyle are established, which can be protective or risky in the present and in the future.[1] The concept of lifestyle has been defined as an overall way of life, based on the interaction between living conditions and individual behavioral patterns, determined by sociocultural factors and personal characteristics;[2] while the lifestyle profile related with health is understood as a set of activities with significant influence on the state of health and are a regular part of the daily pattern of a person's life.[3] In adolescents, the lifestyle profile is defined through behaviors that promote health, such as physical activity, positive outlook on life, interpersonal relationships, health responsibility, stress management, and spiritual health.[4] Scientific evidence indicates that an unhealthy lifestyle is the sum of behavioral risk factors (physical inactivity, unhealthy diet) which lead to the development of cardiovascular disease and diabetes among other chronic non-communicable diseases (CNCD).[5-7]

The CNCD are a public health concern of major relevance globally and represent an economic burden for health services. It is estimated that by 2030, the proportion of deaths due to CNCD will reach 70% and the global morbidity burden will reach 56%.[8] Meanwhile, in Colombia in recent years CNCD register a considerable increase in the rate of care per 100-thousand inhabitants, as consequence of their high incidence. Due to the foregoing, it is estimated that health costs will increase by nearly 40% between 2022 and 2030.[9] The high incidence of CNCD is associated with modifiable behavioral risk factors, like physical inactivity, unhealthy diet, and tobacco and alcohol consumption. Studies have revealed the benefits of a healthy lifestyle in preventing and managing CNCD during all life stages.[10,11]

In this regard, the WHO considers that adolescence is an important moment of human development to lay the foundations for good health.[1] Nursing professionals are the largest segment of health professionals and are in a key position to assume leadership for health promotion, helping people from all ages to stay healthy and create healthy environments, with a holistic approach, from an individual perspective. Nurses assess the health-promoting lifestyle profile, as base to adapt a health promotion plan and to make clinical decisions. This assessment also shapes the nature of the client-nurse partnership, such as frequency of contact and the need for coordination with other health professionals.[12] The aforementioned highlights the need to evaluate healthy lifestyles in adolescents to be able to influence the primary prevention of CNCD by implementing health promotion and maintenance interventions, which are effective in achieving changes related with behavioral risk factors. However, for researchers, academics, and health professionals to

be able to evaluate the health-promoting lifestyles of adolescents (baseline) and to objectively demonstrate the changes in them after receiving an intervention, valid and reliable measurement instruments are required.

The most commonly used instruments to assess the health-promoting lifestyle in adolescents are: the Fantastic[13] and the Adolescent Lifestyle Profile - Revised 2 (ALP-R2) scale; the latter is designed for adolescents. In its original version, it has evidence of construct validity with a seven-factor structure and reliability tests with a Cronbach's alpha of 0.93.[4] Notwithstanding, said scale has not been translated and validated in the Spanish version, which limits its use in Colombian adolescents, given that its psychometric properties are unknown. The aim of this study was to determine the validity and reliability of the ALP-R2 scale translated into Spanish in Colombian adolescents, so that it can be used in nursing research and practice and by other professionals interested in evaluating lifestyles and proposing effective interventions to promote a health-promoting behavior in adolescents.

Methods

A psychometric study was used, which included the translation process and adaptation of the ALP-R2 scale (English to Spanish) as previous phase, and the tests of apparent validity, content validity, construct validity, and reliability for the Spanish version.

Instrument

The ALP-R2 scale was developed from the Health-Promoting Lifestyle Profile II scale designed with the Health Promotion Model (HPM) by Nola Pender for adult population. The study by Hendricks *et al*., [4] modified the initial 42-item scale, adding two items and dividing the personal growth subscale in two: spiritual health and positive outlook on life, resulting in the ALP-R2 scale made up of 44 items and 7 subscales: health responsibility (items: 3, 8, 14, 22, 33, 34, 44), physical activity (items: 2, 4, 16, 27, 32, 40), nutrition (items: 7, 10, 13, 21, 24, 30, 42) positive outlook on life (items: 18, 23, 26, 28, 38, 39), interpersonal relationships (items: 1,6, 12, 19, 31, 37), stress management (items 5, 11, 17, 25, 36, 43), and spiritual health (items: 9, 15, 20. 29, 35, 41). The ALP-R2 scale uses a 4-point Likert-type response format (1: never, 2: sometimes, 3: often, and 4: always). The score can be obtained in both the subscales as from the total scale by adding the items, for the total scale being a minimum value of 44 and a maximum of 176. The higher the score, the better the health-promoting lifestyle profile behaviors of adolescents.[4]

Procedure

The translation of the ALP-R2 scale from English to Spanish was carried out independently by two bilingual translators (a nurse with experience on the construct to measure and an official translator without knowledge on the theme). Both translations were evaluated considering the semantic and cultural equivalence between the original version and the one translated by a panel of experts (researchers, two nurses, and a linguist). The back-translation from Spanish to English was carried out independently by two new native English translators. The translation into Spanish and the backtranslation were approved by Dr. Nola Pender. The evaluation of the apparent and content validity of the Spanish version of the ALP-R2 scale was performed by a group of six Colombian nurses, considered experts given their experience in psychometric studies and professional formation.

To conduct the construct validity tests, a random sample representative of the total population of 1,476 adolescents was used, calculated with a 95% confidence level (standard error = 5%; p = 0.5; q = 0.5; Kish index = 0.15). The recommended sample size for factor analysis was also considered by the number of absolute cases

(>200) and cases per observed variable, which considers the sample size according to the number of indicators and the number of latent constructs, suggesting 15 cases per observed variable.[14] The sample was selected through convenience, to include both phases of adolescence: early (10-14) and late (15-19). Students enrolled in four public and private educational institutions in the city of Ibagué-Colombia, aged 10 to 19 years, were included. The study excluded adolescents who were diagnosed with chronic diseases and/or physical limitations that impeded engaging in physical activity and/or who had special diets; information obtained by self-report. Each of the adolescents completed the Spanish version of the ALP-R2 scale and the sociodemographic form was developed by the researchers, with prior consent from the adolescents and informed consent from the parents. To ensure data quality, training was provided to research assistants in the application of the instrument, verification of the completion of the entire scale, and correct completion of the study database.

Data analysis

To evaluate the apparent and content validity of the ALP-R2 scale, Fleiss's kappa index was used and the content validity ratio and content validity index were calculated according to the modified Lawshe model.[15] In the construct validity tests of the ALP-R2 scale a descriptive analysis was carried out of the data (mean, standard deviation, asymmetry, kurtosis, and item-total corrected correlation coefficient). Adequacy of the sample size and the correlation among the variables was evaluated through the Kaiser-Meyer-Olkin test (≥ 0.6 is acceptable) and Bartlett's test of sphericity (p <0.05). To assess the contribution by each item to its respective subscale, factor loadings were calculated through an exploratory factor analysis (EFA), using the principal component analysis extraction method and Oblimin rotation with Kaiser normalization.

For the confirmatory factor analysis (CFA), measures of the model's fit to the data were calculated based on the relationship between the Chi-square value (χ^2) and the degrees of freedom (*df).* It was considered that the values of χ^2 / *df* < 5 and the cut-off points recommended for each of the measures of absolute fit (Chi-square weighted by degrees of freedom, standardized mean square error, root mean square error of approximation); measures of incremental fit (comparative fit index, normed fit index and non-normed fit index) and measures of parsimony fit (comparative fit index de parsimony, parsimony normed fit index and Akaike information criterion.[16] Reliability was evaluated using internal consistency as criterion by calculating Cronbach's coefficient (α >0.7). Data was analyzed in SPSS 22 and AMOS 22 statistical software.

Ethical aspects. This study was approved by the ethics committee at Universidad del Tolima and was authorized by the rectors of the educational institutions where information was collected. All participants had informed consent signed by their parents and the assent of minors. International and national ethical guidelines were followed (Resolution 8430 of 1993 and Legislation 911 of 2004).

Results

Apparent and content validity

The 44 items in the Spanish version of the ALP-R2 scale were rated by the panel of experts (n = 6). Substantial agreement was obtained (Fleiss Kappa index of 0.8 in comprehension, 0.8 in clarity and 0.8 in precision). All the items were accepted (content validity ratio > 0.8) with satisfactory content validity index (0.9).

Construct validity

Of the entire study sample (n = 1,476) more men (53.5%) participated than women. The minimum age was 10 years and the maximum age was 19 years, with a mean of 13.8±1.8 years, with the highest frequency in the group from 12 to 16 years of age (81.9%). It was found that 73.1%

was studying basic secondary educational level and the remaining 26.9% was studying in primary education.

Descriptive statistics and correlations among the items of the ALP-R2 scale

Table 2 shows that the average scores of the items in the ALP-R2 scale were between 1.6±0.82 and 3.47±0.95, obtaining the lowest scores in items 33 and 22 and the highest scores in item 44 of the health responsibility subscale and in items 13 and 30 of the nutrition subscale. The data distribution in the items was approximately symmetric, recording symmetry values between -1.58 and 1.40 and kurtosis between -1.38 and 1.39, from which normality is inferred. The internal consistency of the ALP-R2 total scale ($\alpha = 0.913$) and for each of the subscales resulted reliable.

According with the EFA results (KMO = 0.931; $\chi 2$: 18434.331; $df = 946$; $p<0.0001$), the item-total correlation maintains a 7-factor structure and the location of the items in the seven subscales, as contemplated in the theoretical model of the original version of the ALP-R2 scale with an accumulated variance of 44.9% and $\alpha = 0.913$ (95% CI: 0.906 – 0.919). Now, the reliability analysis suggests eliminating item 44, bearing in mind the predefined criterion (item-total correlations < 0.2). Since a value far from the reference measure is not recorded, in addition to not being negative and noting that the increase in the alpha values is not large, the exclusion of said item is not considered, however, the need to study the suggested model is created. Regarding the contribution of the items within each subscale to the variation of the responses given by the Colombian adolescents participating in the study, with the EFA it can be seen that for the health responsibility subscale the lowest variation was registered in item 44; in physical activity in item 2; in nutrition in items 13 and 30 followed by items 10 and 42; in positive outlook on life in item 26; in interpersonal relationships in items 1 and 19; and in stress management in item 17. In spiritual health, all the items have large significant contribution (> 0.5) indicating the higher factor loading in item 41. Moreover, the highest variation was found in items 34, 16, 7, 18, 12, and 11, as shown in Table 1.

Table 1. Descriptive statistics, correlations between the items and factor loading (EFA)

Items	Mean ± SD[a]	Asymmetry	Kurtosis	Item-total Correlation	α[b] if the item is suppressed	Factor loading
Health responsibility (α = 0.694; 95% CI: 0.669 - 0.717) % Variance by factor 2.4%						
3	1.88 ± 0.97	0.980	0.004	0.439	0.650	0.640
8	1.84 ± 0.72	0.735	0.749	0.343	0.675	0.373
14	2.26 ± 0.98	0.451	-0.764	0.518	0.626	0.671
22	1.68 ± 0.84	1.178	0.779	0.411	0.658	0.609
33	1.60 ± 0.82	1.401	1.390	0.466	0.645	0.710
34	2.03 ± 0.94	0.715	-0.329	0.576	0.609	0.774‡
44	3.47 ± 0.95	-1.581	1.083	0.198**	0.737	0.083†
Physical activity (α = 0.809; 95% CI: 0.793 – 0.824) % Variance by factor 6.1%						
2	2.53 ± 0.85	0.321	-0.660	0.307	0.828	0.282†
4	2.8 0± 1.04	-0.214	-1.228	0.636	0.763	0.795
16	2.98 ± 1,01	-0.411	-1.151	0.667	0.756	0.803‡
27	2.84 ± 0.96	-0.163	-1.150	0.589	0.775	0.653

Table 1. Descriptive statistics, correlations between the items and factor loading (EFA) (Cont.)

Items	Mean ± SD[a]	Asymmetry	Kurtosis	Item-total Correlation	α[b] if the item is suppressed	Factor loading
Physical activity (α = 0.809; 95% CI: 0.793 – 0.824) % Variance by factor 6.1%						
32	2.97 ± 1,01	-0.430	-1.091	0.604	0.771	0.736
40	2.83 ± 1,03	-0.244	-1.210	0.602	0.771	0.762
Nutrition (α = 0.609; 95% CI: 0.578 – 0.639) % Variance by factor 4.6%						
7	2.03 ± 0.74	0.699	0.694	0.250	0.594	0.673‡
10	2.45 ± 0.95	0.234	-0.863	0.298	0.581	0.267†
13	3.47 ± 0.86	-1.368	0.539	0.254	0.594	0.027†
21	2.37 ± 0.87	0.443	-0.467	0.479	0.517	0.366
24	2.42 ± 0.90	0.347	-0.678	0.391	0.547	0.490
30	3.47 ± 0.73	-1.111	0.229	0.252	0.593	0.029†
42	2.85 ± 1.01	-0.277	-1.145	0.345	0.565	0.270†
Positive outlook on life (α = 0.754; 95% CI: 0.734 – 0.773) % Variance by factor 22.0%						
18	2.97 ± 0.97	-0.383	-1,079	0.548	0.703	0.679‡
23	3.25 ± 0.93	-0.856	-0.549	0.554	0.702	0.641
26	3.25 ± 0.84	-0.785	-0.373	0.206	0.787	0.372†
28	2.78 ± 0.98	-0.077	-1,200	0.595	0.689	0.676
38	3.29 ± 0.82	-0.794	-0.436	0.555	0.704	0.643
39	3.44 ± 0.81	-1,220	0.425	0.524	0.712	0.669
Interpersonal relationships (α = 0.627; 95% CI: 0.597 – 0.656) % Variance by factor 3.4%						
1	2.92 ± 0.83	-0.101	-1.024	0.285	0.610	0.173†
6	3.04 ± 0.89	-0.378	-1.005	0.433	0.554	0.692
12	2.68 ± 0.97	-0.043	-1.068	0.385	0.573	0.700‡
19	2.95 ± 0.91	-0.380	-0.831	0.238	0.629	0.207†
31	2.90 ± 0.91	-0.169	-1.118	0.363	0.582	0.514
37	3.04 ± 0.90	-0.481	-0.767	0.451	0.547	0.637
Stress management (α = 0.691; 95% CI: 0.665 – 0.714) % Variance by factor 2.5%						
5	3.12 ± 0.88	-0.465	-0.993	0.395	0.658	0.345
11	2.74 ± 0.91	0.010	-1.038	0.442	0.643	0.720‡
17	2.80 ± 0.90	-0.005	-1.102	0.298	0.688	0.262†
25	3.20 ± 0.82	-0.515	-0.983	0.501	0.627	0.581
36	2.82 ± 0.96	-0.200	-1.073	0.481	0.629	0.309
43	2.51 ± 1.01	0.127	-1.094	0.419	0.652	0.349
Spiritual health (α = 0.788; 95% CI: 0.771 – 0.805) % Variance by factor 4.0%						
9	1.73 ± 0.81	1.052	0.713	0.424	0.781	0.540
15	2.62 ± 1.12	-0.036	-1.384	0.399	0.795	0.524
20	1.73 ± 0.96	1.148	0.228	0.519	0.761	0.733
29	2.06 ± 0.96	0.637	-0.517	0.645	0.730	0.758
35	2.22 ± 0.97	0.465	-0.723	0.594	0.743	0.727
41	2.17 ± 1.01	0.478	-0.848	0.680	0.719	0.794‡

Extraction method: principal components analysis; Rotation method: Oblimin with Kaiser normalization; $\chi 2$: chi-squared; df: degrees of freedom; *significance p > 0.05; a: Standard deviation; b: Cronbach's alpha; 95% CI: 95% Confidence Interval for Cronbach's alpha; ** Item-total correlation <0.2; ‡ item that contributes the most to the variation; † item that contributes the least to the variation.

Table 2 shows that the mean score of the total ALP-R2 was 2.66 ± 0.42. Among the subscales, higher scores were obtained in positive outlook on life (3.16 ± 0.60) and the lowest scores were for health responsibility (1.88 ± 0.58). According to sex, the scores of the total APL-R2 and the subscales differed between men and women. Overall, men had higher scores, thereby, better health-promoting behavior compared with women (2.75 ± 0.39 against 2.56 ± 0.43; t = 8.716, p <0.001). Likewise, significant differences were found among the scores of the subscales, except for the interpersonal relationship's subscale (t = 0.796, p = 0.426).

Table 2. Cronbach's alpha and comparison of means of the suggested model according to sex

Subscale	Cronbach's Alpha	General sample	Men (n = 789)	Women (n = 687)	p (t value)
RH	0.737	1.88 ± 0.58	1.92 ± 0.60	1.83 ± 0.56	0.005** (t = 2.845)
PA	0.809	2.82 ± 0.70	3.03 ± 0.65	2.59 ± 0.69	<0.001* (t = 12.718)
N	0.609	2.72 ± 0.48	2.81 ± 0.45	2.61 ± 0.49	<0.001** (t = 8.15)
POL	0.754	3.16 ± 0.60	3.29 ± 0.54	3.02 ± 0.62	<0.001** (t = 9.017)
IR	0.627	2.92 ± 0.53	2.93 ± 0.52	2.91 ± 0.55	0.426 (t = 0.796)
SM	0.691	2.86 ± 0.57	2.98 ± 0.53	2.73 ± 0.60	<0.001** (t = 8.316)
SH	0.788	2.09 ± 0.68	2.12 ± 0.69	2.05 ± 0.66	0.044* (t = 2.02)
TOTAL	0.913	2.66 ± 0.42	2.75 ± 0.39	2.56 ± 0.43	<0.001** (t = 8.716)

RH = health responsibility; PA = physical activity; N = nutrition; POL = positive outlook on life; IR = interpersonal relationships; SM= stress management; SH= spiritual health; Mean ± Standard deviation; t: Student's t-statistic; p= p value

** The difference is significant at 0.01 level (p < 0.01); * The difference is significant at 0.05 level (p < 0.05).

Construct validity

Table 3 shows that the CFA results provide satisfactory adjustment indices for both the 44-item theoretical model (CMIN/DF = 4.326, SRMR = 0.0562, RMSEA = 0.047) and for the 43-item suggested model (CMIN/DF = 4.367, SRMR = 0.0558, RMSEA = 0.048); considering that the measure of absolute fit that determines the degree to which the general model predicts the correlation matrix met the minimum necessary requirements (CMIN/DF < 5), similar to the measure that represents the anticipated adjustment with the total value of the population (RMSEA < 0.08) and the measure that measures the standardized residual covariance of the sample (SRMR < 0.08). With respect to the measures of incremental fit that allow comparing the improvement in the fit of the suggested model in relation with a theoretical model, satisfactory results were obtained given that in each of the indices evaluated an increase was registered for the suggested model (CFI = 0.839, NFI = 0.801, NNFI = 0.827) against the results in the base model (CFI = 0.834, NFI = 0.795, NNFI = 0.822), approaching the recommended threshold in each case (> 0.90).

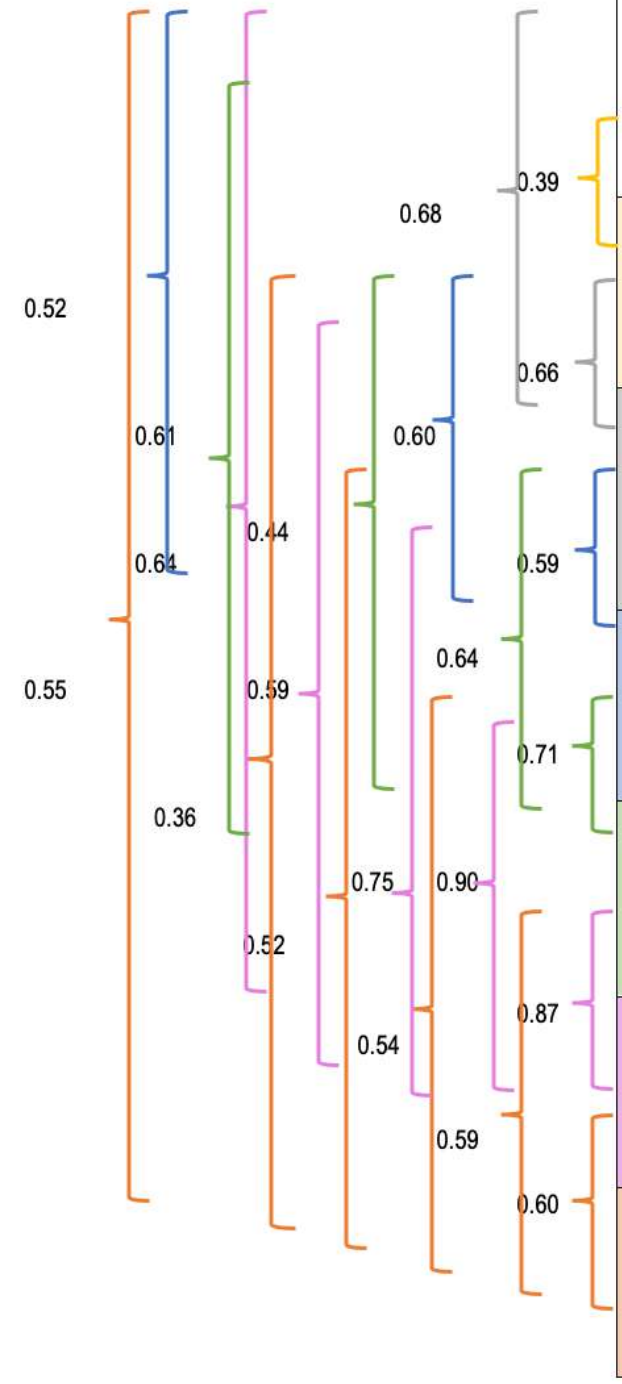
Both models under study were compared by analyzing the measures of parsimony fit that relate the constructs with the theory that supports them and when considering the degrees of freedom available in the measures of incremental fit, these turn out to be indices less sensitive to the sample size. The indices of the suggested model (PCFI = 0.780. PNFI = 0.745, AIC = 3964.080) contrasted with the indices of the theoretical model (PCFI = 0.777, PNFI = 0.741, AIC = 4116.949) were better; being adequate in both cases (PCFI, PNFI > 0.5), it was noted that when excluding item 44 the PCFI and PNFI indices increased getting closer to 1.0, indicating a better fit in the model with respect to the relation of the items with the subscale they seek to explain. In addition, upon analyzing the comparative measures of adequacy with the Akaike information criterion (AIC) as the smaller values indicate a better fit, the suggested model was considered the most adequate. Although the suggested model provides some improvement in the adjustment indices regarding the theoretical model, it must be highlighted that said improvement is minimal, which confirms that not much is gained by considering the exclusion of item 44, however, a review is suggested in the revision of this item in similar populations.

Table 3. Confirmatory factor analysis (CFA)

Adjustment indices	Recommended cut-off points	Theoretical model (44 items)	Suggested model (43 items)
Measures of absolute fit			
CMIN/DF[a]	< 5	4.326	4.367
SRMR[b]	< 0.08	0.0562	0.0558
RMSEA[c]	< 0.08	0.047	0.048
CI[d] 90% RMSEA		0.046 – 0.049	0.046 - 0.049
Measures of incremental fit			
CFI[e]	> 0.90	0.834	0.839
NFI[f]	> 0.90	0.795	0.801
NNFI[g]	≥ 0.90	0.822	0.827
Measures of parsimony fit			
PCFI[h]	> 0.5	0.777	0.780
PNFI[i]	> 0.5	0.741	0.745
AIC[j]	The smaller the better	4116.949	3964.080

Source: elaborated by the authors. a: Chi-square weighted by degrees of freedom, b: standardized mean square error, c: root mean square error of approximation, d: confidence interval, e: comparative fit index, f: normed fit index, g: non-normed fit index, h: comparative parsimony fit index, i: parsimony normed fit index, j: Akaike information criterion.

Bearing in mind the EFA and CFA results, the ALP-R2 was finally comprised of 44 items and 7 dimensions conserving the original theoretical model. The factor structure and correlations obtained between the variables and the items of each of the subscales are shown in Figure 1.



Factor	Item	Factor loading
Health responsibility	3	0.51
	8	0.43
	14	0.61
	22	0.55
	33	0.59
	34	0.71
	44	0.16
Physical activity	2	0.38
	4	0.71
	16	0.74
	27	0.68
	32	0.69
	40	0.67
Nutrition	7	0.33
	10	0.41
	13	0.36
	21	0.63
	24	0.48
	30	0.34
	42	0.47
Positive outlook on life	18	0.62
	23	0.67
	26	0.23
	28	0.72
	38	0.64
	39	0.62
Interpersonal relationships	1	0.49
	6	0.48
	12	0.42
	19	0.39
	31	0.50
	37	0.55
Stress management	**5**	0.47
	11	0.47
	17	0.39
	25	0.61
	36	0.64
	43	0.54
Spiritual health	9	0.49
	15	0.47
	20	0.57
	29	0.76
	35	0.69
	41	0.77

Figure 1. Structural diagram of the confirmed theoretical model and standardized correlations

Reliability

The scale's reliability was evaluated through internal consistency. Table 2, already shown, evidences that Cronbach's α coefficients for the total ALP-R2 was of high reliability (α = 0.913). Cronbach's α values ranged between 0.609 and 0.809. The subscales for physical activity (α = 0.809), positive outlook on life (α = 0.754), stress management (α = 0.691), health responsibility (α = 0.694), and spiritual health (α = 0.788) were acceptable. Questionable values were found (< 0.7) in the subscales for nutrition α = 0.609 (95% CI = 0.578 – 0.639) and interpersonal relationships α = 0.627 (95% CI = 0.597 – 0.656), however, with a 95% confidence level, it is estimated that the value is close to 0.70 and does not reach unacceptable scales (< 0.50).

Table 4 shows that the correlations among the subscales were statistically significant ($p < 0.01$) from moderate to strong, ranging between 0.307 (Spiritual health – Physical activity) and 0.646 (Stress management – Positive outlook on life). All the subscales showed correlations with the total scale that ranged between 0.677 (Spiritual health – Total) and 0.766 (Positive outlook on life – Total), being significant from moderate to strong. In general, all the correlations registered were positive.

Table 4. Pearson's correlations between factors from the theoretical model and the total score

	RH r[a]	PA r	N r	POL r	IR r	SM r	SH r
RH	1						
PA	0.337**	1					
N	0.467**	0.506**	1				
POL	0.388**	0.509**	0.434**	1			
IR	0.424**	0.357**	0.420**	0.489**	1		
SM	0.464**	0.463**	0.512**	0.646**	0.583**	1	
SH	0.430**	0.307**	0.356**	0.422**	0.427**	0.438**	1
TOTAL	0.683**	0.700**	0.720**	0.766**	0.716**	0.803**	0.677**

RH: Health responsibility, PA: Physical activity, N: Nutrition, POL: Positive outlook on life, IR: Interpersonal relationships, SM: Stress management, SH: Spiritual health. a: Pearson's correlation coefficient. **$p < 0.01$.

Discussion

This is the first study exploring the validity and reliability of the Spanish version of the ALP-R2 scale in a sample of Colombian adolescents. The psychometric properties evaluated were adequate, reaffirming that it is a multidimensional scale composed of 44 items and 7 subscales that measure a single construct "lifestyle profile of the adolescent" theoretically supported by the HPM as a health-promoting behavior. According to Hendricks *et al.*,[4] adolescents establish behavioral patterns and make decisions about their lifestyles that affect their future health during their transition from childhood to adulthood. Therein, the importance of having an instrument like the ALP-R2 that permits measuring integrally seven domains of a lifestyle that promotes health: health

responsibility, physical activity, nutrition, positive outlook on life, interpersonal relationships, stress management, and spiritual health.

The ALP-R2 scale has subscales similar to other instruments that also measure lifestyle in adolescents, like the Adolescent Lifestyle Questionnaire (ALQ)[17] and Health-Promoting Lifestyle Profile scale (HPLP),[18] but differs from these mainly in that it evaluates the spiritual health dimension and does not include the social support dimension.

The psychometric characteristics of the ALP scale have been revised in adolescents in the late adolescence phase (15 to 19 years of age) in the United States (n = 311-15 to 17 years of age),[19] Brazil (n = 236 -14 to 18 years of age) [20] and in Türkiye (n = 890 -14 to 18 years of age).[21,22] In Spanish-speaking countries, Gaete *et al.,*[23] evaluated the validity and reliability of the Spanish version of the de ALP-R2 in Chile (n = 572 – 14 to 21 years of age). The dimensionality and reliability of the Colombian Spanish version of the ALP-R2 scale found in this study were equivalent to the factor structure of the original version reported by Hendricks *et al*.,[4] of 44 items and 7 subscales. Likewise, the total Cronbach's α coefficient (α = 0.93) and of the subscales are similar, reporting values α >0.7 in the subscales of spiritual health (α = 0.82), positive outlook on life (α = 0.81), physical activity (α = 0.77), and α <0.7 in nutrition (α = 0.65) and stress management (α =0.66). Differences were found in health responsibility (α = 0.82) and interpersonal relationships (α = 0.77) with values higher than those in the present study.

The results are also similar to those reported in Chile by Gaete *et al.,*[23] which also confirmed the theoretical model of 44 items and 7 subscales. The construct validity tests also reported acceptable parameters (SRMR =0.08; GFI =0.98); AGFI =0.97; NNFI =0.97 and RMSEA =0.07; NFI = 0.83 and CFI = 0.87). Nevertheless, the reliability of the global scale (α = 0.87) was lower than that of the original version (α = 0.93) and lower than that found in this study (0.913). Similarly, the reliability of the subscales was lower (α values between 0.49 and 0.85). The lowest value was stress management (α = 0.49) and nutrition (α = 0.55) and the highest value was physical activity (α = 0.85). Furthermore, it was found that all the items had correlations among them and the global scale. Within the health responsibility subscale, item 44 ("I avoid behaviors that are harmful to my health (smoking, alcohol consumption, drug use, sexual activities)) had low correlation with the total scale. This may be explained in part by the fact that adolescents in Colombia do not believe it is a behavior harmful to health. In Colombia, abuse and addiction to psychoactive substances is a public health problem. Consumption of illegal psychoactive substances starts early. The mean onset age is 14.1 years; among the factors that influence consumption in school-aged adolescents are the availability and supply of drugs, low perception of risk in relation to their consumption, and low parental involvement.[24] Regarding the association analysis by gender, significant differences were found among the scores of the subscales, except for the interpersonal relationships subscale (t = 0.796, p = 0.426). These findings differ somewhat with those reported in the Chilean Spanish version of the ALP-R2 where statistically significant differences between men and women were only found in four subscales (health responsibility, interpersonal relationships, spiritual health, and physical activity).

The Colombian Spanish version of the ALP-R2 scale has acceptable psychometric characteristics, which unlike prior studies were evaluated with a robust sample of Colombian adolescents in early and late adolescence phase, as defined by the WHO (10 to 19 years of age). Consequently, it can allow evaluating interventions that promote healthy behaviors and prevent risk behaviors. Nonetheless, this study has some limitations; it was conducted on a convenience sample from a city in Colombia, hence, it cannot be said to be

representative of the entire country. This study did not test the capacity to detect changes over time, therefore, it is recommended to conduct experimental studies that allow evaluating the effect of interventions on the health-promoting behavior of adolescents.

The importance of the present study could have for the nursing discipline and for the adolescent population, lies mainly in being able to have a valid and reliable instrument that permits integrally evaluating the health promoting lifestyle, which allows it to be used in research to test the effectiveness of nursing interventions designed and validated under the HPM theoretical framework. The impact of the study's results on improving knowledge and the nursing practice is mainly based on being able to employ a useful, practical, simple, and necessary empirical indicator for comprehensive assessment of behaviors that promote the health of adolescents (health responsibility, physical activity, nutrition, positive outlook on life, interpersonal relationships, stress management, and spiritual health), with potential to guide better interventions, which permit achieving better health results and practical applications that reinforce the levels of evidence of nursing leadership in promoting and maintaining adolescent health.

This study concludes that the tests of content validity, construct validity, and reliability performed on the Spanish version of the ALP-R2 scale indicated that the scale is valid and reliable and can be used to evaluate lifestyles in adolescents. Further studies are needed to explore the psychometric properties of the ALP-R2 in other Spanish-speaking countries in Latin America to assess the possible cultural differences.

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Annex. Spanish version of the Adolescent Lifestyle Profile and its equivalent in English of the Adolescent Lifestyle Profile-Revised 2

Instructions: reflect carefully on each of the following statements in this questionnaire, and tell us how often you display each of these behaviors by marking with an X in the corresponding box:
Response options: 1: never, 2: sometimes, 3: often, 4: always.

Item	In Spanish	In English
1	Paso tiempo conversando con miembros de mi familia.	I spend time speaking with my relatives.
2	Paso tiempo realizando actividades con mi familia (caminando, jugando).	I spend time carrying out activities with my family (walking, playing).
3	Voy a ver a la enfermera o al médico del colegio si no me estoy sintiendo bien.	I go see the school nurse or doctor if I am not feeling well.
4	Realizo actividad física vigorosa por 20 minutos o más, 3 veces a la semana (danza aeróbica, caminar enérgicamente, correr, saltar lazo montar en bicicleta, nadar).	I engage in vigorous physical activity for 20 minutes or more, three times per week (aerobic dancing, brisk walking, running, jumping rope, cycling, swimming).
5	Duermo entre 6 y 8 horas en la noche.	I sleep between 6 and 8 hours at night.

6	Felicito a los demás cuando hacen algo bien.	I congratulate others when they do something well.
7	Evito los dulces u otros alimentos ricos en azúcar.	I avoid sweets and other foods high in sugar.
8	Leo artículos sobre temas de salud.	I read articles about health topics.
9	Hablo con los demás sobre mis creencias espirituales.	I talk with others about my spiritual beliefs.
10	Elijo leche o productos lácteos bajos en grasa (yogurt, queso, helado).	I choose milk or low-fat dairy products (yogurt, cheese, ice cream).
11	Dedico tiempo cada día para descansar.	I take time each day to rest.
12	Procuro ser sensible frente a los sentimientos de los demás.	I try to be sensitive to the feelings of others.
13	Desayuno.	I have breakfast.
14	Hago preguntas al doctor o a la nurse para entender sus instrucciones.	I ask questions to the doctor or nurse to understand their instructions.
15	Siento que hay un poder superior guiando mi vida.	I feel there is a higher power guiding my life.
16	Participo en actividades recreativas o deportes.	I participate in recreational or sports activities.
17	Acepto las cosas de mi vida que no puedo cambiar.	I accept the things in my life that I cannot change.
18	Me siento entusiasmado sobre el futuro.	I feel excited about the future.
19	Paso tiempo con amigos cercanos.	I spend time with close friends.
20	Asisto a un grupo que comparte mis creencias espirituales.	I attend a group that shares my spiritual beliefs.
21	Como entre 2 y 4 porciones de fruta al día.	I eat between 2 and 4 portions of fruit per day.
22	Asisto a programas de prevención y mejoramiento de la salud.	I attend health prevention and improvement programs.
23	Estoy feliz con quien soy.	I am happy with who I am.
24	Como entre 3 y 5 porciones de verduras cada día.	I eat between 3 and 5 portions of vegetables per day.
25	Saco tiempo para hacer las cosas que me gustan.	I make time to do the things I like.
26	Trabajo para alcanzar metas importantes en mi vida.	I work to reach important goals in my life.
27	Camino o realizo alguna actividad en mi tiempo libre.	I walk or conduct some activity in my free time.

28	Espero con ansias cada nuevo día.	I look forward anxiously to each new day.
29	Realizo actividades que me ayudan a crecer espiritualmente.	I carry out activities that help me to grow spiritually.
30	Como variedad de carnes (pollo, pescado, res, cerdo).	I eat a variety of meats (poultry, fish, beef, pork)
31	Resuelvo mis conflictos a través del diálogo en lugar de la pelea.	I settle my conflicts through dialogue rather than fighting.
32	Juego juegos activos con mis amigos (baloncesto, softbol, voleibol, tenis, etc.).	I play active games with my friends (basketball, softball,volleyball, tennis, etc.,).
33	Busco la guía del consejero escolar cuando la necesito.	I seek guidance from the school counselor when I need it.
34	Consulto al doctor o a la enfermera sobre cómo mejorar mi salud.	I consult with the doctor or nurse about how to improve my health.
35	Dedico tiempo a la oración o a la meditación.	I dedicate time to prayer and meditation.
36	Trato de tener pensamientos agradables mientras me quedo dormido.	I try to have pleasant thoughts while I fall asleep.
37	Hago un esfuerzo especial por ser útil a los demás.	I make a special effort to be useful to others.
38	Me fijo metas que puedo alcanzar.	I set goals I can reach.
39	Me siento bien conmigo mismo cuando hago algo bien.	I feel good with myself when I do something well.
40	Hago ejercicio hasta que se me acelera el corazón and sudo.	I exercise until my heart races and I sweat.
41	Uso mis creencias espirituales como guía para lo que hago.	I use my spiritual beliefs as a guide for what I do.
42	Bebo seis (6) o más vasos de agua al día.	I drink six (6) or more glasses of water per day.
43	Discuto mis problemas con alguien cercano para intentar resolverlos.	I discuss my problems with someone close to try to solve them.
44	Evito comportamientos perjudiciales para mi salud (fumar, consumir alcohol, consumir drogas, actividades sexuales)	I avoid behaviors that are harmful to my health (smoking, alcohol consumption, drug use, sexual activities).

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Cross mapping of self-care interventions for expert patients

Original Article

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Cross mapping of self-care interventions for expert patients

Abstract

Objective. To compare the primary nursing interventions described in the literature to promote self-care among expert patients with the Nursing Interventions Classification. **Methods.** This descriptive and exploratory study used a quantitative approach and cross-mapping focusing on 23 self-care actions obtained from a scoping review conducted in January 2022 in Brazilian and international databases. Data were descriptively analyzed, processed, and presented in tables. **Results.** Twenty-three self-care actions were found in the scoping review. A total of 56 interventions were selected, 30 of which were associated with self-care actions; some were associated with more than one intervention (e.g., physical activity, avoiding alcohol consumption, blood glucose monitoring, blood sugar management, stress/anxiety). **Conclusion.** The self-care interventions promoted among expert patients were compared to the Nursing Interventions Classification, enabling nurses to lead by encouraging, assisting, teaching, discussing, and guiding patients. Hence, nursing workers can improve their work process by encouraging patient self-care and autonomy in the health-illness continuum.

Descriptors: self-care; standardized terminology in nursing; patient safety; nursing care; patient participation.

Mapeo cruzado de intervenciones de autocuidado para el paciente *experto*

Resumen

Objetivo. Comparar las principales intervenciones de enfermería para el autocuidado del paciente experto descritas en la literatura con la Clasificación de Intervenciones de Enfermería. **Métodos.** Estudio descriptivo, exploratorio, de enfoque cuantitativo con mapeo cruzado que se centró en 23 acciones de autocuidado, surgido de una revisión de alcance realizada en enero de 2022 en bases de datos nacionales e internacionales. Los datos fueron analizados, procesados y presentados de forma descriptiva presentando los resultados en tablas. **Resultados.** En la revisión del alcance se encontraron 23 acciones de autocuidado. Se seleccionaron 56 intervenciones, de las cuales 30 estuvieron asociadas a acciones de autocuidado, por lo que algunas

de las acciones tuvieron más de una intervención, como actividad física, evitar el consumo de alcohol, monitoreo de glucemia, manejo de la glucemia, estrés/ansiedad. **Conclusión.** Las intervenciones de autocuidado de pacientes expertos frente a la Clasificación de Intervenciones de Enfermería otorgaron al enfermero protagonismo en acciones para estimular, asistir, enseñar y orientar al paciente. Con esto, la enfermería mejora su proceso de trabajo fomentando el autocuidado y la autonomía del paciente en su proceso salud-enfermedad.

Descriptores: autocuidado; terminología estandarizada en enfermería; seguridad del paciente; atención de enfermería; participación del paciente.

Mapeamento cruzado das intervenções de autocuidado para o paciente *expert*

Resumo

Objetivo. Comparar as principais intervenções de enfermagem para o autocuidado do paciente *expert* descritos na literatura com a Classificação das Intervenções de Enfermagem. **Métodos.** Estudo descritivo, exploratório, de abordagem quantitativa com mapeamento cruzado que incidiu sobre 23 ações de autocuidado, oriundas de uma revisão de escopo realizada em janeiro de 2022 em bases de dados nacionais e internacionais. Os dados foram analisados, tratados e apresentados de maneira descritiva mediante apresentação dos resultados em tabelas. **Resultados.** Foram encontradas 23 ações de autocuidado na revisão de escopo. Selecionaram-se 56 intervenções, das quais, 30 foram associadas com as ações de autocuidado, de modo que algumas das ações dispunham de mais de uma intervenção, como a exemplo de atividade física, evitar o consumo de álcool, monitoramento da glicemia, manejo do estresse/ansiedade. **Conclusão.** as intervenções de autocuidado dos pacientes *experts* comparadas a Classificação das Intervenções de Enfermagem, proporcionam ao enfermeiro o protagonismo de ações para estimular, auxiliar, ensinar, discutir e orientar o paciente. Com isso, a enfermagem melhora seu processo de trabalho ao estimular o autocuidado e a autonomia do paciente em seu processo de saúde-doença.

Descritores: autocuidado; terminologia padronizada em enfermagem; segurança do paciente; cuidados de enfermagem; participação do paciente.

Introduction

The term expert patient concerns individuals who can seek information on health topics like diseases, diagnoses, medications, symptoms, and treatments for themselves and others, as well as discuss such aspects with health professionals. Thus, the expression emerged to refer to an active, self-confident individual able to manage his/her care.[1-3] The expression patient expert appeared in 1990 at Stanford University, with the "Chronic Disease Self-Management Program," aimed to transfer/share knowledge and skills related to the care required by a disease. This methodology enabled the program to be expanded worldwide, starting with the first schools opened in European countries. For example, the Expert Patient Programme (EPP) was proposed in 2002 in the United Kingdom and is now adopted in other parts of the world to develop and implement new management policies for people with chronic diseases.[1,4] Most expert patients have at least one chronic disease. They are trained to become protagonists of their care, capable of establishing strategies and making decisions to achieve positive results in their treatment.[5]

Chronic diseases are a common global health problem, imposing high costs on the healthcare sector. Therefore, strengthening information technology support systems aimed at patient- and family-centered care is essential, as well as involving professionals from both levels of care.[6] Note that the participation of health professionals in this process builds a horizontal relationship and enables the establishment of ties of trust to achieve positive results in patient care. In this sense, nursing workers stand out because they are present at different levels of complexity and seek measures to intervene in the health-disease continuum to promote care.[2,7] Therefore, taxonomies are one of the strategies that can promote a standardized language in nursing care, enabling the comparison and evaluate the care provided in different contexts by different professionals. At the same time, the Nursing Interventions Classification (NIC) emerged as a clinical tool with standardized language that describes the treatments nurses implement among patients, supports clinical decision-making, assists managers in personnel and equipment dimensioning, and facilitates communication, among other benefits that contribute to the advancement of care.[8]

This widely adopted system is part of the operationalization of nursing care based on the Nursing Process (NP). This methodological instrument guides the care and practice of the nursing team. The NP is organized into five interrelated and interdependent stages: data collection, nursing history investigation, diagnosis, planning, implementation, and evaluation.[9]
Thus, using NIC to manage the care of expert patients can promote greater independence and safety for the self-management of their clinical conditions.[8] Additionally, interventions must adapt to the patient's particularities so

that they can become active agents managing self-care, complementing the educational work performed by healthcare professionals.[1,2] Thus, the question guiding this study is: Which of the expert patients' primary self-care interventions are related to NIC taxonomies? The objective is to compare the primary nursing interventions for the self-care of expert patients described in the literature with NIC.

Methods

This descriptive, exploratory, cross-mapping study adopted a quantitative approach to compare the interventions listed in the scientific literature on self-care actions for expert patients according to the taxonomy of standardized nursing interventions NIC.[10,11] Thus, the cross-mapping method was used as a technique for analyzing non-standardized nursing languages compared to a standardized nursing language.[11] Three adapted steps were applied to use the cross-mapping method: 1) an analysis of the expert patients' self-care; 2) the NIC nursing interventions/activities were selected for each self-care action listed; 3) a list of NIC interventions/activities for each self-care listed.[11] Furthermore, six rules must be considered in the mapping: 1) Selecting a NIC for each self-care listed; 2) Selecting a NIC based on the similarity between self-care and the establishment of the intervention and suggested activities; 3) Determining a keyword from the self-care list, which will help identify the most appropriate intervention/activity in the NIC; 4) Preferably using the verbs used in self-care to select the NIC/activity; 5) Mapping the self-care that uses two verbs, in two different NIC interventions, when the actions are different; 6) Identifying and describing the self-care that cannot be mapped, for any reason.[11] Hence, the cross-mapping focused on 23 self-care actions obtained in a scoping review conducted in January 2022, according to the Joanna Briggs Institute Reviewer's Manual proposed by the theoretical model according to Arksey and O'Malley, based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation, and research protocol registered in the Open Science Framework (OSF), DOI 10.17605/OSF.IO/YPUVM.[12-14]

The following descriptors and keywords were combined to search for the self-care actions: [Chronic Disease OR (Chronic Cases OR Chronic Pictures OR Chronic illness OR Degenerative disease) AND Self Care OR (Self Help OR Self-management of care) AND Primary Health Care OR (Primary Care OR Primary attention OR Basic Service)], which resulted in a final sample of 234 studies. Note that the term expert patient was not used in the search strategy because it is not a controlled descriptor but refers to an individual with a chronic disease.

The following databases were consulted: U.S. National Library of Medicine (PubMed) and Cumulative Index to Nursing and Allied Health Literature (CINAHL), SCOPUS, Cochrane CENTRAL, Web of Science, PsycINFO, Latin American and Caribbean Literature in Health Sciences (LILACS) and Educational Resources Information Center (ERIC), CAPES Theses and Dissertations, the National Library of Australia's Trobe (Trove), Academic Archive Online (DIVA), DART-Europe E-Theses Portal, Electronic Theses Online Service (EThOS), Open Access Scientific Repository of Portugal (RCAAP), National ETD Portal, Theses Canada, Theses and Dissertations from Latin America. Based on the findings regarding self-care actions, the evaluators formed pairs to cross-map the self-care actions performed by expert patients found in the scientific literature and the nursing interventions indexed in the NIC. A third evaluator resolved potential divergences between the two evaluators regarding mapping self-care actions and NIC interventions.

Descriptive statistics were used to analyze, process, and present the results in tables. Furthermore, as this study addresses information in the public domain and does not involve human subjects, there was no need for it to be assessed by an Institutional Review Committee.

Results

Of the 23 self-care actions found in the scoping review, only acupuncture did not integrate the cross-mapping, as no intervention indexed in the NIC was found that was directly related to this practice. Regarding the cross-mapping (Table 1), 56 interventions were first selected. However, the reviewers associated 30 of these with self-care actions, so some of the actions are associated with more than one intervention, such as physical exercise, avoiding alcohol consumption, blood glucose monitoring, stress/anxiety management, hygiene/appearance, pain management, breathing exercises, and cognitive exercises/activities. The activities chosen for each NIC intervention were based on the use of verbs or sentences that convey the idea that the nurse contributes to promoting the patient's active role in their clinical care, such as teaching, encouraging, assisting the patient, discussing with the patient, encouraging, explaining, and guiding, among others. Additionally, such activities may be indicated and adapted for more than one chronic disease and different expert patient profiles (age, culture, gender, level of education, family income, among others).

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC).

Self-care actions	NIC	NIC Activities
Physical activity	EXERCISE promotion: Strength training (0201)	• Helping the patient to express his/her beliefs, values, and goals for achieving muscle fitness and health. • Helping the patient establish realistic goals in the short and long terms and engage with the exercise plan. • Helping the patient to create an environment at home/workplace that facilitates engaging with the exercise plan. • Helping the patient devise a continuous recording system that includes the gym weights and the number of repetitions and sequences to monitor progress in muscle fitness.
	EXERCISE therapy: control muscle control (0226)	• Explaining why specific exercises are chosen and the protocol established for the patient/family • Helping the patient establish realistic and measurable goals. • Incorporating activities of daily life into the exercise protocol, if appropriate. • Encouraging the patient to exercise independently, if indicated.
Balanced diet	EATING Disorders Management (1030)	• Establishing expectations toward adequate eating behavior, food and fluid intake, and physical exercise. • Holding the patient responsible for his/her diet choices and physical activity, as appropriate. • Helping the patient to assess how adequate his/her choices regarding diet and physical activity are and their respective consequences.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Medication adherence	TEACHING: prescribed medication (5616)	• Teaching the patient to recognize the medications' different characteristics as appropriate. • Teaching the patient about the purpose and action of each medication. • Teaching the patient about the dosage, route, and duration of each medication. • Teaching the patient about the administration/correct application of each medication. • Revise what the patient knows about medications. • Teaching the patient to perform the necessary procedures before taking medications, as appropriate. • Informing the patient about the consequences of not taking the medication or stopping it suddenly, as appropriate. • Informing the patient about potential drug/food interactions, as appropriate. • Teaching the patient about the correct disposal of needles and syringes at home and where to place the sharps container in the community, as appropriate. • Helping the patient to organize a written medication schedule. • Warn the patient about giving prescribed medications to other people. • Provide information about programs/organizations to save financial resources when buying medications and devices, as appropriate. • Providing information about medication alert devices and how to obtain them.
Regular consultations/exams	Telephone CONSULTATION (8180)	• Considering cultural and socioeconomic barriers regarding the patient's reactions. • Identifying the patient's concerns regarding health status. • Establishing the knowledge of the person on the telephone and the source of such knowledge. • Determining the patient's ability to understand teaching/instructions over the phone. • Inform the patient about prescribed therapies and medications, as appropriate. • Identifying actual/potential problems regarding the self-care regime. • Involving the family/significant persons in the care and planning. Answering questions.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Social activities	SOCIALIZATION Enhancement (5100)	• Encouraging patients to improve their involvement in already-established relationships. • Encouraging patients to be tolerant when developing relationships. • Promoting relationships with people who share common interests and goals. • Encouraging social and community activities. • Encouraging patients to share common problems. • Encouraging patients to become involved with completely new interests. • Encouraging patients to participate in group or individual remembrance activities. • Facilitating the patient's participation in groups that tell stories. • Helping the patient to improve perception of his/her communication strengths and weaknesses. • Encouraging the patient to change environments, such as going for a walk or to the movies. • Encouraging the patient to plan special activities in small groups.
Avoiding alcohol consumption	SUBSTANCE use treatment (4510)	• Identifying factors (e.g., genetic, psychological distress, stress) contributing to chemical dependency. • Encouraging the patient to take control over his/her behavior. • Helping patient/family to identify denial as a substitute for confronting the problem. • Helping the patient identify the adverse effects of chemical dependency on health, family, and daily functioning. • Identifying with the patient constructive goals to offer alternatives to the use of substances to alleviate stress. • Helping the patient to choose an alternative activity that is compatible with the abused substance. • Identifying support groups in the community to treat long-term substance abuse.
	SUBSTANCE use prevention (4500)	• Helping the person tolerate higher stress levels, as appropriate. • Encouraging responsible decision-making regarding lifestyle options. • Helping the patient to identify strategies to decrease tension.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Avoiding smoking	SMOKING Cessation Assistance (4490)	• Determining the patient's readiness to learn how to quit smoking. • Giving clear and coherent advice to quit smoking. • Helping the patient to identify the reasons and barriers to quitting smoking. • Reassuring the patient that nicotine withdrawal symptoms are temporary. • Helping the patient identify psychosocial aspects influencing a smoker's behavior. • Helping the patient devise a plan to quit smoking that addresses psychosocial aspects influencing a smoker's behavior. • Helping the patient to recognize indicators that lead him/her to smoke. • Helping the patient to develop practical methods to resist strong desires. • Encouraging the patient to keep a cigarette-free lifestyle. • Encouraging the patient to join a smoking cessation support group that s/he meets weekly. • Helping the patient with self-help methods.
Hyperglycemia monitoring	HYPERGLYCEMIA management (2120)	• Monitoring for hyperglycemia signs and symptoms: polyuria, polydipsia, polyphagia, weakness, lethargy, malaise, blurred vision, or headache. • Encouraging oral intake of fluids. • Monitoring fluid status (including intake and output) as appropriate. • Instructing the patient and significant others on how to prevent, recognize, and manage hyperglycemia. • Encouraging self-monitoring of blood glucose levels. • Helping the patient to interpret blood glucose levels. • Facilitating the patient to adhere to the diet and exercise regimens.
	HYPOGLYCEMIA control (2130)	• Monitoring hypoglycemia signs and symptoms. • Providing feedback regarding adequate hypoglycemia self-control. • Instructing the patient and significant others on hypoglycemia signs and symptoms, risk factors, and treatment. • Encouraging self-monitoring of blood glucose levels.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Foot care	FOOT care (1660)	• Examining the skin for irritation, cracks, lesions, bunions, calluses, deformities, or edema. • Carefully drying between the toes. • Applying creams. • Cleaning the nails. • Discuss regular foot care routine with the patient. • Instructing the patient/family on the importance of foot care. • Instructing the patient to examine the inside of shoes for rough areas. • Instructing the patient on the importance of inspections, especially when there is decreased sensation. • Referring to a podiatrist for trimming thick toenails, as appropriate. • Instructing the patient on how to prepare and trim toenails.
Regular sleep/ rest	SLEEP enhancement (1850)	• Instructing the patient to monitor sleep patterns • Encouraging the patient to establish a bedtime routine to facilitate the transition from wakefulness to sleep. • Instructing the patient to avoid foods and beverages at bedtime that may interfere with sleep. • Helping the patient limit daytime sleep by providing activities that promote wakefulness, as appropriate. • Instructing the patient to use autogenic muscle relaxation or other nonpharmacological forms of sleep induction.
Weight management	WEIGHT management (1260)	• Discuss with the patient the relationship between food intake, exercise, weight gain, and weight loss. • Discuss with the patient the habits, customs, and cultural and hereditary factors influencing weight. • Discussing the risks associated with being overweight or underweight. • Determining the individual's motivation to change eating habits. • Developing with the individual a method of keeping a daily record of food intake, exercise sessions, and changes in body weight. • Encouraging the individual to write down realistic weekly goals for good food intake and exercise and display them where they can be reviewed daily. • Encouraging the individual to record his/her weight every week on a chart, as appropriate. • Encouraging the individual to consume adequate amounts of water daily.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Stress/ anxiety management	RESILIENCY promotion (8340)	• Encouraging family/community to value achievements. • Encouraging family/community to value health. • Encouraging positive health-seeking behaviors. • Facilitating the development and use of neighborhood resources.
	EMOTIONAL support (5270)	• Talking with the patient about the emotional experience(s). • Exploring with the patient what triggered the emotions. • Helping the patient identify feelings, such as anxiety, anger, or sadness. • Encouraging the patient to express feelings of anxiety, anger, or sadness. • Encouraging talking or crying as a way to decrease emotional response. • Referring for counseling, as appropriate
Hygiene/ Appearance	SELF-CARE assistance: bathing/hygiene (1801)	• Considering the patient's culture when promoting self-care activities. • Considering the patient's age when promoting self-care activities. • Providing care until the patient is fully capable of assuming self-care. • Helping the patient determine the extent of actual changes in the body or level of functioning.
	Body IMAGE enhancement (5220)	• Helping the patient separate physical appearance from feelings of self-worth, as appropriate. • Helping the patient determine the peer influence on his/her perception of current body image. • Facilitating contact with people experiencing similar changes in body image. • Identifying support groups
Goal setting	Mutual GOAL setting (4410)	• Encouraging the patient to identify specific life values. • Determining how the patient recognizes the problem. • Encouraging the patient to identify his/her strengths and capabilities. • Helping the patient identify realistic and achievable goals. • Developing and using a goal attainment scale, as appropriate. • Identifying goals together with the patient. • Assisting the patient in assessing the resources available to achieve the goals. • Helping the patient establish a realistic timeline. • Coordinating with the patient periodic review dates to assess progress toward goals. • Reevaluating goals and the plan, as appropriate.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Blood pressure measurement	VITAL SIGNS monitoring (6680)	• Monitoring blood pressure, pulse, temperature, and respiratory pattern as appropriate • Checking apical and radial pulses simultaneously and note differences as appropriate. • Monitoring skin color, temperature, and moisture. • Identifying potential causes for vital signs changes. • Periodically checking the accuracy of the instruments used to obtain patient data.
Pain management	Patient-controlled ANALGESIA (PCA) assistance (2400)	• Teaching the patient and family to monitor pain intensity, quality, and duration. • Teaching the patient and family to monitor respiratory rate and blood pressure. • Teaching the patient and family to use the PCA device. • Teaching the patient and family to adjust the infusion rate to the appropriate level on the PCA device. • Teaching the patient and family about pain-relieving agents' actions and side effects.
	PAIN management (1400)	• Investigate the patient's knowledge and beliefs about pain. • Investigate with the patient the factors that alleviate/worsen the pain. • Teaching pain management principles. • Encouraging the patient to monitor his/her pain and intervene appropriately. • Teaching nonpharmacological techniques before, during, and after painful activities, whenever possible, before pain occurs or worsens, and in conjunction with other pain relief measures. • Encouraging the patient to talk about his/her pain experience, as appropriate. • Incorporating the family into the pain relief method whenever possible.
Meditation	MEDITATION facilitation (5960)	• Instruct the patient to sit comfortably. • Instruct the patient to close his/her eyes, if desired. • Instruct the patient to relax all muscles and remain relaxed. • Helping the patient choose a mental resource to be repeated during the procedure. • Instruct the patient to mentally/silently repeat the resource while exhaling through the nose. • Instruct the patient to ignore scattered thoughts and return to the mental resource. • Instruct the patient to perform the procedure once or twice a day but wait two hours after meals.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Breathing exercises	RESPIRATORY monitoring (3350)	• Monitoring breathing frequency, rhythm, depth, and effort.
	VITAL SIGNS monitoring (6680)	• Monitoring blood pressure, pulse, temperature, and respiratory pattern, as appropriate. • Monitoring respiratory rate and rhythm (e.g., chest depth and symmetry). • Identifying potential causes of changes in vital signs.
Daily inhalation	MEDICATION administration: inhalation (2311)	• Determining the patient's knowledge of the medication and understanding of the method of administration. • Instruct the patient to tilt the head back slightly and exhale completely. • Instruct the patient to repeat inhalations as recommended, waiting at least one minute between inhalations. • Teaching and monitoring the self-administration technique, as appropriate.
Adequate water intake	FLUID management (4120)	• Monitoring hydration status (e.g., moist mucous membranes, adequate pulse, and orthostatic blood pressure) as appropriate. • Monitoring food/fluid intake and calculating daily caloric intake as appropriate. • Encouraging oral intake
Cognitive exercises/ activities	MEMORY TRAINING (4760)	• Implementing appropriate memorization techniques, such as visual images, mnemonic resources, memory games, memory indicators, association techniques, adopting lists, using a computer, labels, or information rehearsal. • Assisting associated learning tasks such as learning by doing and recalling verbal and pictorial information as appropriate. • Providing training and guidance, such as rehearsal of personal information and dates, as appropriate. • Providing guidance to the patient to acquire new learning, such as locating geographical aspects on a map, as appropriate. • Providing recognition memory of photographs/pictures, as appropriate. • Encouraging the patient to participate in group programs to train memory, as appropriate.
	COGNITIVE stimulation (4720)	• Talking to the patient. • Asking the patient to repeat information. • Giving verbal and written instructions.

Table 1. Cross-mapping between self-care actions performed by expert patients found in the scoping review with the interventions and activities in the Nursing Interventions Classification (NIC). (CONT.)

Self-care actions	NIC	NIC Activities
Safe sex	TEACHING: safe sex (5622)	• Counseling the patient to use effective birth control methods as appropriate • Encouraging the patient to be selective when choosing sexual partners, as appropriate. • Counseling the patient on low-risk sexual practices, such as those that avoid penetration or exchange of body fluids, as appropriate. • Reinforcing the use of condoms. • Encouraging patients at high risk for sexually transmitted diseases to have regular checkups.

Discussion

The diversity of self-care actions available to expert patients indicates an increase in ways patients can be encouraged to take an active role in their care to achieve positive results, considering that many of these activities can be included or adapted for more than one chronic disease, in the case of patients with comorbidities.[15-17] Thus, nursing workers have the opportunity to improve the work process by planning, together with expert patients, the self-care actions that will be implemented according to each patient's particularities, considering daily routine, behaviors, family and social environment, feelings, culture, monthly income, experiences, and perceptions, as these are directly related to how a patient sees and deals with his/her clinical condition.[15-20]

Furthermore, Achury-Saldaña *et al*.,[1] Bastos *et al*.,[7] Freilich *et al*.,[15] and Robles-Sanchez *et al*.[20] state that encouraging self-management of care is a strategy for expanding nursing care beyond the physical sphere of health services, considering improved health teaching practices, the fact that the nursing profession has been increasingly appreciated, a recognition of the tools developed and used by nurses, and improved patient-professional relationships.[1,7,15,20] Therefore, the intersection of self-care actions obtained in the scoping review on the NIC/activities shows that nurses can encourage expert patients to become autonomous and perform proper self-care, a practice implemented even before this new patient profile was disseminated and understood; the taxonomy of nursing interventions was developed and began being used in the 1980s, while the term expert patient emerged ten years later, precisely when the number of people living with a chronic disease grew exponentially worldwide.[2-4,8,21,22] Furthermore, NIC is constantly updated, and new interventions/activities are added to meet global and epidemiological transformations,[8] which possibly explains why some self-care actions have more than one corresponding NIC intervention, among which the following stand out: physical activity, blood glucose monitoring, stress/anxiety management, breathing exercises, and cognitive exercises/activities.

The self-care actions listed above lead to a greater depth of clinical knowledge, improving patient outcomes and providing a source of data for future research. Thus, it is important to note the importance of activities intended to monitor,

prevent, and resolve potential clinical problems that may affect a patient's treatment and quality of life.[1,4,9] Note that these self-care practices are directly associated with diseases such as obesity, diabetes, chronic obstructive pulmonary disease, depression, Alzheimer's, and anxiety, which are part of the group of chronic diseases most frequent in recent years.[17,21,22]

Thus, Rocha *et al.*[23] and Soares-Pinto *et al.*[24] agree that there should be an incentive to conduct scientific research more focused on self-care actions that can be inserted, clarified, and optimized in the NIC to cover the growing and diverse number of chronic diseases affecting the population requiring devices to assist in their independent clinical management, including the possibility of solving daily problems, without the need to commute to a healthcare facility.[23,24] Among the actions mapped, the nursing team involved in this process stands out as the agents who assist in such activities to provide and regulate direct care delivery in patients' daily routines, meeting social, educational, and care needs. In this sense, the bio-psycho-social-spiritual human being needs to adapt to his/her environment to maintain balance and good behavior in the dimensions proposed. In this sense, nurses are educators who perform these activities pertinent to the profession.[25]

In this regard, the NIC interventions, combined with the self-care actions presented in the scoping review, revealed a strong connection with the care that nurses promote in hospital settings. Such connection may lead to a perception disconnected from the concept of expert patient and support that prioritizes self-care management beyond the scope of health services. Nevertheless, although the activities linked to the interventions are performed by nursing workers, the interventions selected in this study are those aimed at promoting self-care, as they enable nurses to assess, together with their patients, their knowledge and understanding of their conditions, limitations, as well as those of their families within the context of their homes, and the possibilities available for adapting care.[1,9,19,23] However, encouraging an individual to become an active agent responsible for his/her self-care does not make one an expert patient, as such knowledge requires a detailed assessment of favorable aspects, followed by complementary training.[2,4,5,20] Another aspect to highlight is the absence of a NIC intervention linked to the acupuncture self-care action. The reason, according to Bousfield *et al*.[26] and Maul *et al*.,[27] is that, despite an increased appreciation and implementation of complementary therapies originating from Eastern medicine in Western health services given the many positive results, there are few activities with this profile in the NIC taxonomy. Hence, future studies are suggested to investigate similar practices to be considered and implemented according to self-care management.[26,27] Thus, there are many self-care activities nurses can or should implement to meet the diverse representations of expert patients, as these individuals are increasingly able to deal with their clinical condition through actions that can be adjusted and adapted.

Conclusion. Among the primary self-care interventions promoted among expert patients related to the NIC taxonomies, the following stand out: physical activity, balanced diet, medication adherence/use, regular consultations/examinations, social activities, avoiding alcohol and tobacco consumption, and blood glucose monitoring. These activities implemented in interventions enable nurses to encourage, assist, teach, discuss, and guide patients. Therefore, nurses improve their work process by encouraging patient self-care and autonomy to deal with the health-disease continuum. Furthermore, despite a cross-mapping based on nursing interventions for self-care actions obtained from a scoping review, information supports the transformation, improvement/reconstruction of a language used by nurses in the work process directed at expert patients. However, one of this study's limitations concerns the strong reference in the NIC to nursing care provided in the hospital setting. Such a reference contradicts what is proposed

for expert patients in primary health care. Therefore, further studies are needed to address activities that prioritize these patients' self-care management in other healthcare settings. Therefore, promoting research, discussions, and the validation of new nursing taxonomies concerning self-care interventions for expert patients and disseminating them is essential to strengthening the care continuity for patients and nursing workers in different healthcare services.

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Influencing Factors on the Success of Mobile Learning: A Systematic Review and Meta-Analysis

Review

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Influencing Factors on the Success of Mobile Learning: A Systematic Review and Meta-Analysis

Abstract

Objective. To study the geographical regions, success factors, and types of mobile device features that could result in educational success and early take-up. **Methods.** This systematic review and meta-analysis searched PubMed, CINAHL, EMBASE, PsycINFO and ProQuest databases between 2010 and November 2022. The keywords were m-learning features, practical experiences, and influencing. Comprehensive Meta-Analysis software was used to analyze and combine data. **Results.** 48 articles were reviewed in this study. Compatibility and user-friendliness of mobile phones were mentioned as key factors influencing the use of mobile devices in learning. Also, the key role of users' perspectives, attitudes, and skills as determinant factors of applying mobile technology in the learning process was revealed, which confirms its significant role in the success of m-Learning. Other influencing factors were tools readiness, the availability of appropriate resources, motivation of learners and their active engagement, support, and learning styles which considerably could play a key role in improving the quality of m-learning. Applying different strategies including collaboration, effective interaction, reflection, or inquiry-based learning can be beneficial in improving the success rate of m-learning. The final factor was technical competence which showed a significantly negative correlation with m-learning success according to learners' perspective. The meta-analysis indicated that most studies on mobile learning were conducted between 2015 and 2021, primarily utilizing quantitative methodologies. These studies focused on young adults and were carried out in various countries, including the United States, Spain, Taiwan, Saudi Arabia, the United Kingdom, Turkey, China, Australia, Italy, Sri Lanka, Malaysia, Oman, Austria, South Africa, Egypt, India, Portugal, Jordan, South Korea, Iran, Finland, Brazil, and Israel. A meta-analysis identified 23 countries, with the United States having the highest number of studies on mobile learning success factors. Key determinants reported were learning approach and learners' perception, with estimates of 0.68 (95% CI 0.06-0.98) and 0.44 (95% CI 0.33-0.56), respectively. In contrast, Jordan and Iran had the lowest number of studies, with learning approach being the main contributing success factor from the learners' perspective, estimated at 0.736 (95% CI 0.68-0.78) **Conclusion.** Successful m-learning should include the investigation of trainees' educational needs and motivation; provision of adequate infrastructure and learning materials; definition of learning objectives and course contents; and coordination of appropriate learning activities in order to ensure continuous progress in learners' knowledge and awareness on different course topics.

Descriptors: academic success; health education; mobile applications; learning.

Factores que influyen en el éxito del aprendizaje móvil: Una revisión sistemática y meta-análisis

Resumen

Objetivo. Estudiar las regiones geográficas, los factores de éxito y los tipos de características de los dispositivos móviles que podrían propiciar el éxito educativo y la adopción temprana de este tipo de aprendizaje. **Métodos.** En esta revisión sistemática y metanálisis se realizaron búsqueda de artículos en las bases de datos PubMed, CINAHL, EMBASE, PsycINFO y ProQuest entre 2010 y noviembre de 2022. Las palabras clave fueron características del m-learning, experiencias prácticas e influencia. Se utilizó el software Comprehensive Meta-Analysis para analizar y combinar los datos. **Resultados.** Se revisaron 48 artículos. La compatibilidad y la facilidad de uso de los teléfonos móviles se mencionaron como factores clave que influyen en el uso de dispositivos móviles en el aprendizaje. También se reveló el papel clave de las perspectivas, actitudes y habilidades de los usuarios como factores determinantes de la aplicación de la tecnología móvil en el proceso de aprendizaje, lo que confirma su importante papel en el éxito del m-Learning. Otros factores influyentes fueron la disposición de las herramientas, la disponibilidad de recursos apropiados, la motivación de los alumnos y su compromiso activo, el apoyo y los estilos de aprendizaje, que considerablemente podrían desempeñar un papel clave en la mejora de la calidad del aprendizaje móvil. La aplicación de diferentes estrategias, como la colaboración, la interacción efectiva, la reflexión o el aprendizaje basado en la investigación, puede ser beneficiosa para mejorar el índice de éxito del m-learning. El último factor fue la competencia técnica, que mostró una correlación significativamente negativa con el éxito del m-learning según la perspectiva de los alumnos. El metaanálisis indicó que la mayoría de los estudios sobre aprendizaje móvil se realizaron entre 2015 y 2021, utilizando principalmente metodologías cuantitativas. Estos estudios se centraron en adultos jóvenes y se llevaron a cabo en diversos países, como Estados Unidos, España, Taiwán, Arabia Saudí, Reino Unido, Turquía, China, Australia, Italia, Sri Lanka, Malasia, Omán, Austria, Sudáfrica, Egipto, India, Portugal, Jordania, Corea del Sur, Irán, Finlandia, Brasil e Israel. Los factores determinantes entre los estudios de 23 países fueron el enfoque del aprendizaje y la percepción de los alumnos, con estimaciones de 0.68 (IC95% 0.06-0.98) y 0.44 (IC95% 0.33-0.56), respectivamente. Por el contrario, Jordania e Irán presentaron el menor número de estudios, siendo el enfoque de aprendizaje el principal factor de éxito desde la perspectiva de los alumnos, con una estimación de 0.73 (IC95% 0.68-0.78). **Conclusión.** El éxito del m-learning debe incluir la determinación de las necesidades educativas y la motivación de los alumnos; la provisión de infraestructuras y materiales de aprendizaje adecuados; la definición de los objetivos de aprendizaje y los contenidos del curso; y la coordinación de las actividades de aprendizaje apropiadas para garantizar un progreso continuo en el conocimiento y la concienciación de los alumnos sobre los diferentes temas del curso.

Descriptores: éxito académico; educación en salud; aplicaciones móviles; aprendizaje.

Fatores que influenciam o sucesso da aprendizagem móvel: Uma revisão sistemática e meta-análise

Resumo

Objetivo. Estude as regiões geográficas, os fatores de sucesso e os tipos de recursos dos dispositivos móveis que podem impulsionar o sucesso educacional e a adoção precoce desse tipo de aprendizagem. **Métodos.** Nesta revisão sistemática e meta-análise, foram pesquisados artigos nas bases de dados PubMed, CINAHL, EMBASE, PsycINFO e ProQuest entre 2010 e novembro de 2022. As palavras-chave foram características de m-learning, experiências práticas e influência. Um software abrangente de meta-análise foi usado para analisar e combinar os dados. **Resultados.** Foram revisados 48 artigos. A compatibilidade do telemóvel e a facilidade de utilização foram citadas como fatores-chave que influenciam a utilização de dispositivos móveis na aprendizagem. Foi também revelado o papel fundamental das perspectivas, atitudes e competências dos utilizadores como fatores determinantes na aplicação da tecnologia móvel no processo de aprendizagem, confirmando o seu importante papel no sucesso do m-Learning. Outros fatores influentes foram a disposição das ferramentas, a disponibilidade de recursos adequados, a motivação e o envolvimento activo dos alunos, o apoio e os estilos de aprendizagem, que poderiam desempenhar consideravelmente um papel fundamental na melhoria da qualidade da aprendizagem móvel. A aplicação de diferentes estratégias, como colaboração, interação eficaz, reflexão ou aprendizagem baseada em investigação, pode ser benéfica para melhorar a taxa de sucesso do m-Learning. O último fator foi a competência técnica, que apresentou correlação significativamente negativa com o sucesso do m-Learning na perspectiva dos alunos. A meta-análise indicou que a maioria dos estudos sobre aprendizagem móvel foram realizados entre 2015 e 2021, utilizando principalmente metodologias quantitativas. Estes estudos centraram-se em adultos jovens e foram realizados em vários países, incluindo Estados Unidos, Espanha, Taiwan, Arábia Saudita, Reino Unido, Turquia, China, Austrália, Itália, Sri Lanka, Malásia, Omã, Áustria, África do Sul, Egito, Índia, Portugal, Jordânia, Coreia do Sul, Irão, Finlândia, Brasil e Israel. Os fatores determinantes entre os estudos de 23 países foram a abordagem de aprendizagem e a percepção dos alunos, com estimativas de 0.68 (IC 95% 0.06-0.98) e 0.44 (IC 95% 0.33-0.56), respectivamente. Pelo contrário, a Jordânia e o Irão apresentaram o menor número de estudos, sendo a abordagem de aprendizagem o principal fator de sucesso na perspectiva dos alunos, com uma estimativa de 0.73 (IC 95% 0.68-0.78). **Conclusão.** O sucesso do m-Learning deve incluir a determinação das necessidades educativas e da motivação dos alunos; o fornecimento de infraestruturas e materiais de aprendizagem adequados; a definição dos objetivos de aprendizagem e dos conteúdos do curso; e a coordenação de atividades de aprendizagem adequadas para garantir o progresso contínuo no conhecimento e consciência dos alunos sobre os diferentes temas do curso.

Descritores: sucesso acadêmico; educação em saúde; aplicativos móveis; aprendizagem.

Introduction

The widely prevalent use of technology in today's life, the continuous updating of information, and the growing need of people to access information without any time and place restrictions as well as the individualization of education have resulted in an emergence of new approaches such as e-learning and mobile learning.[1] On the other hand, wireless technologies and portable electronic devices played a key role in the development of such educational methods.[2] In fact, mobile technology is not only a means to communicate at any time and place, but it is also capable of providing unlimited information in educational fields through the use of developed applications.[3] Mobile learning or m-Learning is the subset of distance learning which uses mobile technologies including mobile phones, tablets, and laptops in the learning process.[4] This method brings several advantages for both teachers and trainees including mobility, quick access to information, time efficiency, personalization, diversity, and flexibility.[5,6] Moreover, it fosters collaborative learning, and rapid feedback which consequently provides social negotiation space and facilitates effective interaction between students and trainers.[7] In a study conducted by Fu and Hwang, it was emphasized that collaborative learning through mobile devices has the potential to increase learners' intellectual and meta-cognitive development.[8] Furthermore, Ozdamli and Cavus highlighted that the core characteristics of mobile learning including individual, collaborative, cooperative, adaptable, and instant transfer of information enable trainees to experience a faithful delight of learning.[9] In fact, with the arrival of mobile devices and smartphones, learning aided by mobile applications can avoid cognitive exhaustion and synaptic fatigue and consequently, they have the potential to efficiently maintain the mechanisms of cognitive task performance. A similar research conducted in Australia found that students had a significant desire to participate in more cooperative learning activities comprised of mobile technologies.[10] Furthermore, they revealed a great sense of commitment to a diverse range of digital tools, and distance learning approaches. Accordingly, the literature affirmed that trainees might feel more encouraged when using mobile technologies in learning.[11-13]

The significant increase in the number of mobile phones per 100 people, from 12.075 in 2000 to 98.622 in 2015 emphasizes that the utilization of mobile devices has become almost worldwide.[14] Accordingly, it is expected that such evolving technologies are progressively used for educational purposes.[15] In fact, besides the use of mobile devices in all aspects of people's lives across the globe, their significant impact on education and learning process which can happen in collaborative, and real life contexts has been emphasized in the literature.[16-19] As higher education graduates are expected to have creativity, engage in rational decision making, and solve problems in a systematic way, on-line courses through the use of mobile devices might be more efficient for improving their thinking skills. Despite the significant expansion of this

technology in the field of education, there are still definite barriers to adoption of a successful m-Learning platform, particularly in higher learning institutions.[20]To resolve the issue, several studies have been conducted worldwide to determine the success factors of m-learning in higher education. Some research aimed to figure out the effect of demographics on the success of m-learning and some others mentioned the long-term use of this learning method as an important factor for its success and effective impact on students' learning capabilities.[21,22] As these research works mainly concentrate on a particular feature of the m-learning program, this study is going to have a more holistic view of the subject and conduct a systematic review and meta-analysis to organize the studies in terms of factors such as geographical regions, success factors, and types of mobile devices which could be important for educational success and early take-up from students.

Methods

A systematic review was conducted based on the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines (PRISMA).[23] This systematic review follows some of the previous works in this area, including a research developed by Alrasheedi *et al.*[20] However, in this study we focused on conducting a systematic review of the literature published since the onset of the 2010 decade and organized a meta-analysis in order to present a series of influencing factors on the success of mobile learning in higher education.

Systematic review procedure. To conduct the systematic review, we followed the procedure consisted of three main phases including planning of systematic mapping; conducting the review; and reporting the review. In the first phase, we conducted a comprehensive search to investigate related studies performed in mobile learning and discover the gap of the existing systematic reviews. The research questions which have been formulated in this review aimed to gain adequate information to determine the critical success factors of mobile learning in higher education. The research questions were: Which countries/ or geographic areas have implemented mobile learning? What are the influencing factors on the success of mobile learning implementation? Which types of mobile devices are more important for mobile educational success?

Databases and search terms. To find relevant studies, electronic databases that include the majority of articles and conference papers associated with the field of mobile learning in higher education including PubMed (MEDLINE), CINAHL, EMBASE, PsycINFO and ProQuest were reviewed within the period of 2010 to 2022. Since the use of mobile devices in education has been seriously considered since the 20th century, older studies were excluded as their findings might no longer be valid to current mobile learning contexts.[24-26] In the phase of conducting the review, the keywords which have been used in the searching process were "m-learning", "mobile learning", "applications", "mobile devices", "mobile apps", "mobile collaborative learning", "collaborative learning", "cooperative learning", "ubiquitous learning", "critical success factors", "key performance indicators" and "higher education". We limited the search to articles with full-text access and published in English. In order to retrieve the maximum number of relevant papers, we also reviewed the reference list of included papers.

Inclusion and exclusion criteria. Then, an initial review of all abstracts was done and followed by an in-depth review of selected articles according to their relevance with study objectives and inclusion criteria including (1) peer-reviewed journal articles, (2) studies containing mobile learning, success factors, and early take-up among students, (3) full-text access, (4) higher education, (5) mobile collaborative learning, and (6) investigation of success factors for m-learning. On the other hand, studies of mobile learning that involved lower educational levels such as school

students or kindergarten children were excluded from the review. Furthermore, papers without full-text access or published in languages other than English were not considered for further review. After reviewing the titles and abstracts of searched papers based on the inclusion and exclusion criteria, the full texts of the papers that could not be removed were reviewed. During this process, 19600 papers were excluded only by reading the titles and abstract, and 14901 by reviewing the full text. Figure 1 shows the process of searching and selecting primary papers.

Data extraction. Two independent investigators used a data extraction form including the name of author/ authors, date of publication, research setting, study design, and a brief of study findings. In terms of any disagreement, a third reviewer was asked to resolve the issue.

Quality Assessment. To assess the methodological quality of included studies, two independent researchers used the Newcastle-Ottawa Scale (NOS). The scale contains eight questions in three main sections including exposure/ outcome ascertainment, selection of study groups, and their comparability. The number of possible answers per question ranges between two and five. A study with score between 7 to 9, was considered as high quality, 4 to 6 as high risk, and 0 to 3 as very high risk of bias. To achieve consensus in case of any discrepancy, we consulted with a third party.[27]

Statistical Analysis. After reviewing the details of each primary article, content analysis was conducted and the studies were coded for the classifications including: author/ authors' name, year of publication, study objective, methodology, and findings. To determine heterogeneity based on different learners' geographical regions, success factors, and types of mobile devices subgroup analysis was used. Meta-analysis was performed using Comprehensive Meta-Analysis software.

Results

According to the search procedure, a total number of 48 articles were extracted. Figure 1 shows the process of selecting studies included in the meta-analysis during the literature review based on Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guideline.

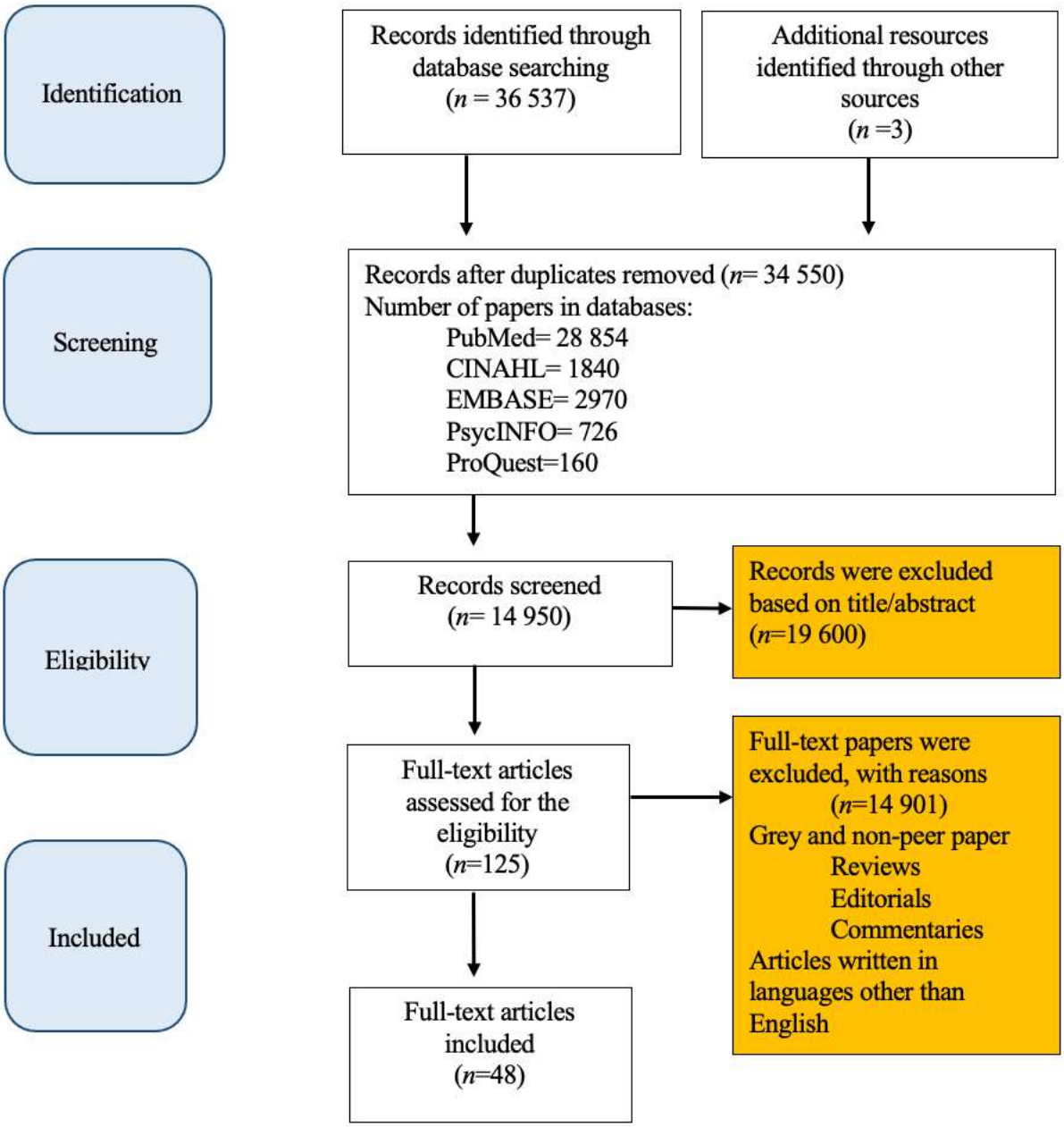

Figure 1. Prisma Diagram

Study findings revealed that the majority of studies on mobile learning was conducted between the years 2015 and 2021, used quantitative methodology, carried on among young adults and in countries including United States, Spain, Taiwan, Saudi Arabia, United Kingdom, Turkey, China, Australia, Italy, Sri Lanka, Malaysia, Oman, Austria, South Africa, Egypt, India, Portugal, Jordan, South Korea, Iran, Finland, Brazil and Israel.

Meta-analysis based on Countries. Based on meta-analysis, 23 countries were identified. Among the countries, United States incorporated the maximum number of research on mobile learning success factors reporting learning approach and learners' perception as key determinants estimated at 0.687 (95% CI, 0.063-0.986) and 0.447 (95% CI, 0.337-0.562) respectively. Whereas, Jordan and Iran were reported to have the lowest number of studies on mobile learning mentioning learning approach as the main contributing success factor from the learners' perspective estimated at 0.736 (95% CI, 0.685-0.781) (Table 1). The summary of selected studies is depicted in Table 2.

Table 1. Meta-analysis based on Countries

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
United states	Device features	0.234	0.185	0.291	-0.876	<0.0001
	Learners' perception	0.447	0.337	0.562	-0.904	0.366
	Learning approach	0.687	0.063	0.986	0.443	0.658
	Pedagogical benefits	0.356	0.299	0.418	-1.422	<0.0001
China	Device features	0.345	0.179	0.366	-0.425	0.249
	Learners' perception	0.425	0.277	0.455	−2.027	<0.0001
	Learning approach	0.435	0.322	0.574	−0.602	0.167
	Pedagogical benefits	0.267	0.162	0.472	0.522	0.114
United Kingdom	Device features	0.567	0.542	0.611	2.146	0.005
	Learners' perception	0.695	0.215	0.561	-2.148	0.005
	Learning approach	0.588	0.542	0.633	3.709	<0.0001
	Pedagogical benefits	0.366	0.344	0.741	−4.385	<0.0001

Table 1. Meta-analysis based on Countries (Cont.)

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
Taiwan	Device features	0.227	0.149	0.312	−2.047	0.586
	Learners' perception	0.315	0.287	0.466	−2.122	0.214
	Learning approach	0.308	0.186	0.355	−2.077	0.645
	Pedagogical benefits	0.245	0.118	0.356	−1.042	0.127
Spain	Device features	0.596	0.512	0.651	2.488	0.005
	Learners' perception	0.588	0.506	0.614	-2.312	0.005
	Learning approach	0.658	0.872	8.125	0.000	0.637
	Pedagogical benefits	0.214	0.551	0.316	−2.953	<0.0001
Malaysia	Device features	0.060	0.066	0.072	-13.833	<0.0001
	Learners' perception	0.471	0.162	0.221	-10.833	<0.0001
	Learning approach	0.367	0.238	0.483	−8.042	<0.0001
	Pedagogical benefits	0.042	0.077	0.082	-18.338	<0.0001
South Africa	Device features	0.014	0.010	0.025	-12.072	<0.0001
	Learners' perception	0.074	0.015	0.298	−2.970	0.003
	Learning approach	0.116	0.132	0.268	−6.180	<0.0001
	Pedagogical benefits	0.189	0.142	0.293	−7.166	<0.0001

Table 1. Meta-analysis based on Countries (Cont.)

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
Australia	Device features	0.518	0.442	0.678	3.104	<0.0001
	Learners' perception	0.541	0.425	0.663	-3.907	<0.0001
	Learning approach	0.598	0.514	0.733	3.908	<0.0001
	Pedagogical benefits	0.314	0.542	0.633	3.709	<0.0001
India	Device features	0.233	0.115	0.298	-1.174	<0.0001
	Learners' perception	0.376	0.198	0.211	-3.978	<0.0001
	Learning approach	0.332	0.157	0.322	-3.786	<0.0001
	Pedagogical benefits	0.188	0.142	0.353	1.907	<0.0001
Sri Lanka	Device features	0.229	0.132	0.365	2.385	<0.0001
	Learners' perception	0.278	0.132	0.427	-2.562	<0.0001
	Learning approach	0.423	0.127	0.356	2.146	<0.0001
	Pedagogical benefits	0.179	0.112	0.342	2.586	<0.0001
Egypt	Device features	0.122	0.137	0.256	-1.768	<0.0001
	Learners' perception	0.229	0.244	0.457	-3.667	<0.0001
	Learning approach	0.342	0.213	0.357	-2.876	<0.0001
	Pedagogical benefits	0.150	0.149	0.157	-1.166	<0.0001

Table 1. Meta-analysis based on Countries (Cont.)

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
Finland	Device features	0.168	0.121	0.215	1.872	0.005
	Learners' perception	0.369	0.321	0.626	2.148	0.005
	Learning approach	0.599	0.512	0.718	3.449	0.005
	Pedagogical benefits	0.165	0.182	0.514	2.418	0.005
Portugal	Device features	0.355	0.285	0.577	2.336	<0.0001
	Learners' perception	0.368	0.225	0.561	3.423	<0.0001
	Learning approach	0.563	0.285	0.671	5.423	<0.0001
	Pedagogical benefits	0.129	0.062	0.250	-4.639	<0.0001
Jordan	Device features	0.029	0.062	0.250	-0.937	<0.0001
	Learners' perception	0.043	0.062	0.250	-2.639	<0.0001
	Learning approach	0.037	0.066	0.228	-3.936	<0.0001
	Pedagogical benefits	0.029	0.042	0.152	-1.369	<0.0001
Saudi Arabia	Device features	0.166	0.152	0.206	-15.692	<0.0001
	Learners' perception	0.311	0.052	0.601	−0.458	0.510
	Learning approach	0.366	0.335	0.659	−1.604	0.004
	Pedagogical benefits	0.256	0.157	0.266	-9.962	<0.0001

Table 1. Meta-analysis based on Countries (Cont.)

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
South Korea	Device features	0.283	0.149	0.417	-0.485	<0.0001
	Learners' perception	0.391	0.172	0.489	−2.920	0.176
	Learning approach	0.371	0.271	0.482	−2.670	0.011
	Pedagogical benefits	0.177	0.292	0.386	−1.495	0.014
Iran	Device features	0.036	0.070	0.408	-4.289	<0.0001
	Learners' perception	0.055	0.064	0.309	1.853	<0.0001
	Learning approach	0.069	0.032	0.696	3.385	<0.0001
	Pedagogical benefits	0.047	0.057	0.286	2.53	<0.0001
Turkey	Device features	0.192	0.132	0.298	−4.250	<0.0001
	Learners' perception	0.286	0.148	0.384	−3.217	<0.0001
	Learning approach	0.426	0.359	0.495	-2.103	0.035
	Pedagogical benefits	0.014	0.025	0.299	−2.770	0.003
Austria	Device features	0.127	0.231	0.325	−2.144	<0.0001
	Learners' perception	0.268	0.183	0.483	−2.712	<0.0001
	Learning approach	0.456	0.389	0.465	-2.103	0.035
	Pedagogical benefits	0.018	0.028	0.287	−2.076	0.003

Table 1. Meta-analysis based on Countries (Cont.)

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
Israel	Device features	0.0892	0.0134	0.287	−3.502	<0.0001
	Learners' perception	0.216	0.148	0.384	−3.127	<0.0001
	Learning approach	0.475	0.359	0.432	-2.301	0.035
	Pedagogical benefits	0.012	0.021	0.280	−1.707	0.003
Oman	Device features	0.026	0.042	0.458	-3.208	<0.0001
	Learners' perception	0.036	0.059	0.326	1.764	<0.0001
	Learning approach	0.072	0.022	0.296	3.385	<0.0001
	Pedagogical benefits	0.037	0.047	0.256	2.53	<0.0001
Italy	Device features	0.237	0.136	0.312	-0.485	<0.0001
	Learners' perception	0.318	0.152	0.397	−2.920	0.001
	Learning approach	0.363	0.251	0.288	−2.670	<0.0001
	Pedagogical benefits	0.142	0.266	0.393	−1.495	<0.0001
Brazil	Device features	0.016	0.080	0.302	-2.892	<0.0001
	Learners' perception	0.155	0.164	0.309	2.538	<0.0001
	Learning approach	0.069	0.032	0.696	3.552	<0.0001
	Pedagogical benefits	0.022	0.036	0.268	2.437	<0.0001

Table 2. The summary of selected studies from the year 2010 to 2022

Althunibat (2015). Country: Jordan. **Study design:** survery. **Findings:** The proposed model of m-learning is comprehensive to study in the institutions of higher education.
Briz-Ponce et al. (2017). Country: Portugal. **Study design:** survery. **Findings:** Technology Acceptance Model was affirmed to be applied within the context of Innovation in Education.
Karimi et al. (2015). Country: UK. **Study design:** Case-control. **Findings:** The role of learners' characteristics in m-learning adoption was approved and the importance of distinguishing between various types of m- learning was highlighted.
Koc et al. (2016). Country: Turkey. **Study design:** Structural equation modeling. **Findings:** Strong exogenous role of context and a positive strong relationship among perceived ease of use, perceived usefulness and trust to intentions to use were confirmed in the study.
Oberer and Erkollar. (2011). Country: Austria. **Study design:** Survey. **Findings:** The advantages of mobile learning modules in higher education were approved
Ooi et al. (2018). Country: Malaysia. **Study design:** Structural equation modeling. **Findings:** Perceived mobility and social presence affected satisfaction indirectly through mobile usefulness and sense of belonging
Parsazadeh et al. (2018). Country: Iran. **Study design:** Case-control. **Findings:** The applicability of the device was significantly effective in improving students' online information evaluation skills.
Shorfuzzaman and Alhussein. (2016). Country: Saudi Arabia. **Study design:** Empirical study. **Findings:** A model was proposed to investigate learners' readiness to adopt M-learning.
So S. (2016). Country: China. **Study design:** Case-control. **Findings:** The use of a MIM tool (WhatsApp) was affirmed to support teaching and learning objectives in higher education
Cho et al. (2017). Country: South Korea. **Study design:** Case-control. **Findings:** Self-regulated learning is important in cultivating positive community of inquiry
Jones et al. (2013). Country: UK. **Study design:** Case study. **Findings:** nQuire could support learners' inquiries in an informal context without teachers presence
Molinillo et al. (2018). Country: Spain. **Study design:** Survey. **Findings:** Flow, active learning and perceived benefits of m-learning can influence on trainees' attitude.
Reychav and Wu. (2016). Country: Israel. **Study design:** Survey. **Findings:** Educators need to balance the interface design of mobile training systems and different complexity levels of cognitive tasks in various training domains, in order to achieve the desired training outcomes.
Sánchez-Prieto et al. (2017). Country: Spain**. Study design:** Structural equation modeling**. Findings:** Trainees perceived usefulness and behavioral intention, perceived ease of use and perceived usefulness, and self-efficacy of m-learning.
Al-Otaibi et al. (2016). Country: Saudi Arabia. **Study design:** Case study. **Findings:** High usability rates and generally positive attitudes toward using the mobile lab system were affirmed.

Table 2. The summary of selected studies from the year 2010 to 2022 (Cont.)

Cheon et al. (2012). Country: USA**. Study design:** Survey. **Findings:** Perceived behavioral control was the main determinant of m-learning adoption.
Gikas and Grant. (2013). Country: USA**. Study design:** Qualitative research**. Findings**: Mobile devices and the use of social media create opportunities for interaction, collaboration, and students' engagement in content creation and communication using social media and Web tools.
Lin and Lin. (2015). Country: Taiwan. **Study design:** Case-control**. Findings**: M-learning is helpful to students in improving learning performance and reducing cognitive loads.
Witt et al. (2016). Country: USA. **Study design:** Survey. **Findings:** M-learning was useful for students allowing them to access information throughout undergraduate medical education**.**
Ekanayake and Wishart. (2015). Country: Sri Lanka**. Study design:** Qualitative study**. Findings:** M-learning provided teachers with an opportunity for planning and reviewing workshops, using the technology in science teaching and learning, and in sharing knowledge and skills.
Christensen and Knezek. (2018). Country: USA**. Study design**: Survey**. Findings:** Educators who are higher in technology integration agree on the usefulness of m-learning, and prefer online or blended learning**.**
Lackovic et al. (2017). Country: UK. **Study design:** Qualitative study. **Findings:** Students perceived Twitter as an employability tool and a tool for transferring knowledge.
Seta et al. (2014). Country: Italy. **Study design:** Review**. Findings:** The future of m-learning can be understood as a 360-degree vision that takes into account a range of pedagogical, managerial, political, and ethical issues**.**
Chang et al. (2016). Country: Taiwan. **Study design:** Case-control**. Findings:** Students who participated in the m-learning program showed a significantly higher level of motivation, confidence, and satisfaction.
Chuang Y-T. (2015). Country: Taiwan. **Study design:** Survey. **Findings:** The Smartphone-Supported Collaborative Learning System could support collaborative learning.
Lan et al. (2012). Country: Taiwan**. Study design:** Case-control**. Findings:** Students who used mobile devices in learning could engage more in reflective thinking, share more information, and facilitate social knowledge construction.
Masters et al. (2016). Country: Oman**. Study design:** Review. **Findings:** M-learning can help medical teachers benefit from technological advances at all levels of medical education and improve patient healthcare**.**
Pimmer et al. (2014). Country: South Africa. **Study design:** Case study**. Findings:** Mobile phones, and the convergence of mobile phones and social media, can change learning environments in a constructive way.
Bellina and Missoni (2011). Country: Italy. **Study design:** Qualitative study**. Findings:** The possibility to share images on the mobile phone and share information in group discussions proved the usefulness of educational mobile tools.
Gedik et al. (2012). Country: Turkey. **Study design:** Survey. **Findings:** The function of mobile instruction was critical in pedagogical aspects; the use of motivational design was also helpful in delivering educational content.

Table 2. The summary of selected studies from the year 2010 to 2022 (Cont.)

O'Bannon and Thomas (2015). Country: USA. **Study design:** Survey**. Findings:** Access to the Internet, clicker capabilities, and the use of educational apps were the most valuable aspects of m-learning. However, disruptions, cyberbullying, and accessing inappropriate content were significant barriers to the use of mobile phones in the classroom.
Al-Emran (2016). Country: Oman. **Study design:** Not specified. **Findings:** Significant differences were found among students' attitudes towards m-learning based on smartphone ownership, country, and age**.**
Domingo and Badia Garganté (2016). Country: Spain. **Study design:** Survey. **Findings:** M-learning helps teachers leverage the combination of mobile technology and apps to improve certain aspects of learning practice.
Melero et al. (2015). Country: Spain. **Study design:** Survey**. Findings:** Using mobile phones for learning has a significant positive impact on educational performance.
Leinonen (2014). Country: Finland. **Study design:** Survey. **Findings:** There is potential for fostering reflective practices in classroom learning through the use of apps for audio-visual recordings**.**
Lam and Duan (2012). Country: European countries**. Study design:** Design research**. Findings:** There is potential for improving reflective practices in classroom learning through the use of apps for audio-visual recordings**.**
Scott (2017). Country: Australia. **Study design:** Mixed-method**. Findings:** For many students and physicians, the advantages of using mobile devices for learning outweighed the possible risks.
Kuznekoff et al. (2015). Country: Not specified. **Study design:** Experimental study**. Findings:** Unrelated messages to class content negatively impacted learning, while related messages did not have a significant negative impact.
Felisoni and Godoi (2018). Country: Brazil. **Study design:** Survey**. Findings:** M-learning can be useful for educators and other academic stakeholders interested in using technology to promote the educational performance of trainees.
Jarrahi et al. (2017). Country: USA**. Study design:** Survey. **Findings:** The diversity of information and communication technologies affects individuals' preferences and contextual factors.
Sobaih et al. (2016). Country: Egypt**. Study design:** Survey. **Findings:** Social media can be used as an innovative and effective tool for teaching and learning.
Nayak J.K. (2018). Country: India. **Study design:** Survey. **Findings:** Female students were less affected by smartphone addiction compared to male students, who experienced neglect of work, anxiety, and loss of control.
Mu and Paparas (2015). Country: UK. **Study design:** Survey. **Findings:** Kahoot integrated the advantages of clickers and mobile technology for economics teaching.
Frank and Kapila (2017). Country: USA. **Study design:** Survey**. Findings:** Students who used mixed-reality learning environments showed improvement in their knowledge of dynamic systems and control concepts**.**
Dolawatta et al. (2020). Country: Sri Lanka. **Study design:** Survey. **Findings:** The most significant influential factor in the success of m-learning was screen zooming.

Table 2. The summary of selected studies from the year 2010 to 2022 (Cont.)

Alhumaid et al. (2021). Country: Saudi Arabia. **Study design:** Structural equation modeling. Findings: Mobile learning in education, amid the coronavirus pandemic, yielded potential outcomes for teaching and learning.
Qashou A. (2021). Country: Not specified. **Study design:** Not specified**. Findings:** Perceived usefulness and attitude significantly influenced m-learning adoption intention, while perceived usefulness, perceived ease of use, and perceived self-efficacy significantly affected attitudes toward using m-learning.
Al-Rahmi et al. (2021). Country: Malaysia**. Study design:** Survey**. Findings:** The study validated a technology acceptance model, demonstrating that the predicted model effectively predicts students' attitudes towards using m-learning.

Influencing factors on mobile learning. Thirty-three of included research mentioned compatibility and user friendly of mobile phones as key factors influencing the use of mobile devices in learning.[28-36] Literature review also revealed the key role of users' perspectives, attitudes and skills as determinant factors of applying mobile technology in the learning process, which confirms its significant role in the success of m-Learning.[29,30,37-41] Other influencing factors were regarded as tools readiness, the availability of appropriate resources, motivation of learners and their active engagement, support and learning styles which considerably could play a key role in improving the quality of mobile learning.[29,42-49] In fact, applying different strategies including collaboration, effective interaction, reflection, or inquiry-based learning can be beneficial in improving the success rate of m-learning.[36,50-54] These features can be integrated in educational courses through the use of a variety of mobile applications. For instance, trainees can benefit from messenger application to share a particular content either in the form of a text, image or video and consequently make their classmates discuss about the shared contents.[54-59] As it is shown in Table 3, both educational content and user friendly design had positive correlations with m-learning success and were mentioned as significant factors by trainees to choose m-learning approach as an effective learning strategy. Ownership which mainly deals with flexibility to use m-learning anytime, anyplace, the possibility to use m-learning platform to connect with other educators, and learners' perception were also regarded as other contributing factors for the success of m-learning approach. The last factor was technical competence which showed a significantly negative correlation with m-learning success according to learners' perspective. This means that students in selected studies believed that they already have a quite appropriate technical capability which provides them an opportunity to use m-Learning platform.

Table 3. Meta-analysis of Success Factors for m-learning

Success factor categories	Related factors	Effect size and 95% Interval			Test of null (2-Tail)	
		Point estimate	Lower limit	Upper limit	Z-value	P-value
Device features	Compatibility	0.278	0.164	0.372	-3.461	<0.0001
	Functionality and readiness	0.266	0.133	0.469	-7.070	<0.0001
	Availability	0.258	0.158	0.344	-4.095	<0.0001
Learners' perspective	Self-control	0.232	0.156	0.447	-5.092	0.01
	Flexibility	0.189	0.102	0.254	-2.156	0.01
	Life-long learning	0.065	0.981	0.227	-0.0936	0.01
Pedagogical benefits	Collaborative learning	0.264	0.152	0.414	-3.643	0.01
	Integrative learning	0.225	0.113	0.365	-2.675	<0.0001
	Interactive learning	0.235	0.013	0.129	-1.905	<0.0001
	Learning in context	0.208	0.087	0.356	-3.190	<0.0001
	Problem-based learning	0.0745	0.162	0.374	-3.449	<0.0001
Learning approach	User friendly	0.276	0.142	0.254	-7.500	<0.0001
	Assimilation with curriculum	0.189	0.227	0.284	-4.439	0.012
	Technical competence	0.0298	0.179	0.310	-3.782	<0.0001
	User feed back	0.0542	0.166	0.347	-2.908	<0.0001
	Learning community development	0.088	0.214	0.592	-3.763	<0.0001

As data shows in the table, compatibility of the device and user-friendly of the learning approach had substantial effects on the success of m-Learning platform based on the trainees' experience. Furthermore, as factors including availability of resources, positive attitude of learners toward the learning approach and pedagogical benefits revealed a correspondingly high point estimates, it was proved that each of the mentioned factors had significant impacts on students' experience with the m-Learning platform.

Mobile devices. Regarding mobile learning tools and technologies, most of the studies mentioned mobile phones and tablets as principal component of learning which accordingly allow students to access different sources of information from anywhere, they exist [35, 57, 60]. Literature affirmed that the functionality of mobile devices such as providing social media, images, videos, massages, and virtual learning can help the learning process develop in an effective manner.[32,33,45, 53,61-68] As shown in Table 4, mobile phones, tablets, personal digital assistants (PDAs) and the iPod touch revealed the most compatibility with the needs and desires of learners. In fact, these means of communication have become an integral part of human life, and easily facilitate provide users with appropriate access to the required information in the shortest possible time.[57] Therefore, these mobile technologies not only make learning possible at any time and place, but also facilitate easy access to some important features such as taking photos and videos, sending SMS, and sharing information through social medias or benefiting from virtual learning environments.[58-62,69-71]

Table 4. Meta-analysis based on type of device

Sub-groups	Effect size and 95% interval			Test of null (2-Tail)	
	Point estimate	Lower limit	Upper limit	Z-value	P-value
Mobile phone	0.633	0.412	0.6667	1.082	0.017
Tablet	0.509	0.372	0.635	8.011	<0.0001
Personal digital assistant	0.242	0.146	0.269	-3.988	<0.0001
iPod touch	0.187	0.106	0.215	-2.879	<0.0001

Meta-regression for Quality Assessment. In case of quality assessment, more than half of the included studies had high quality, while 17 studies were of medium quality and the rest were of low quality (Table 5).

Table 5. Meta-analysis based on quality of studies

Sub-groups		Effect size and 95% interval			Test of null (2-Tail)	
	Number Studies	Point estimate	Lower limit	Upper limit	Z-value	P-value
High	28	0.268	0.176	0.352	-2.701	<0.0001
Low	8	0.159	0.115	0.304	-3.266	<0.0001
Medium	17	0.234	0.198	0.339	-4.627	<0.0001

Publication bias. The results of Egger's statistical test showed the P-value (2-tailed) of 0.48, confirming no publication bias in the study (Figure 2).

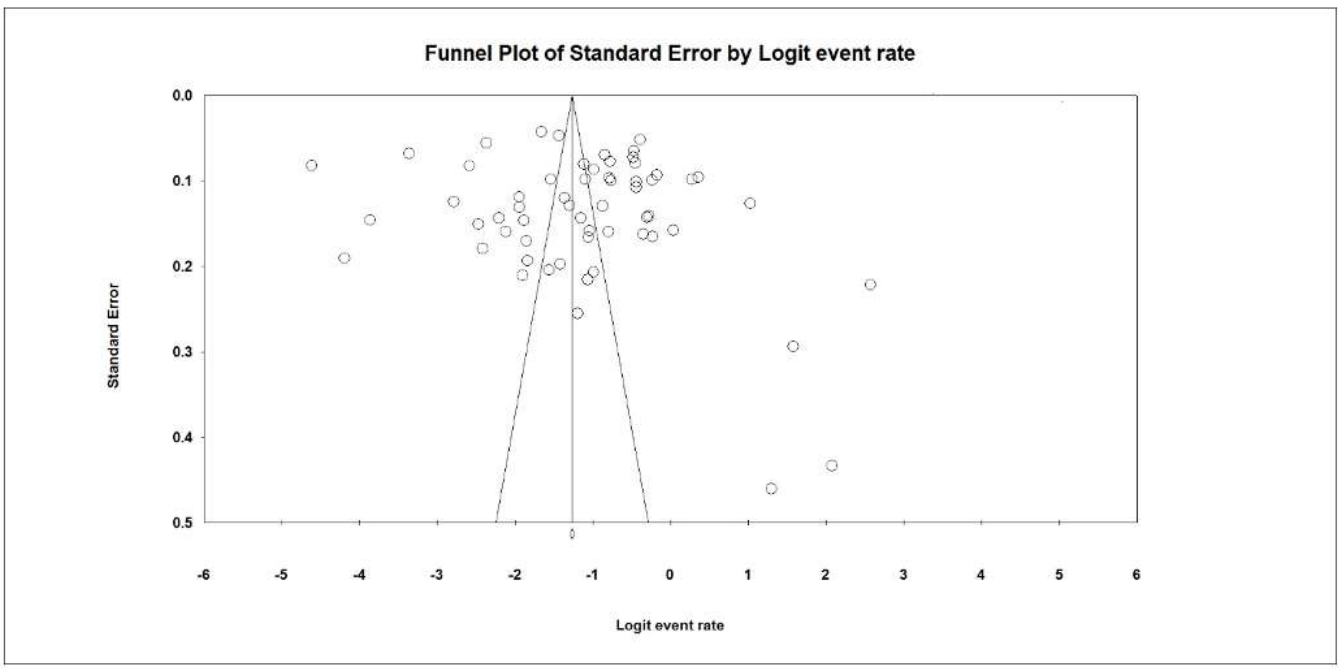

Figure 2. The results of Egger's statistical test

Discussion

In this article, a systematic review and meta-analysis was done to provide a comprehensive review of the existing literature in the field of mobile learning in higher education. Our study identified 48 research conducted in 23 countries worldwide. As findings revealed, the number of studies in the years 2019 to 2022 exceeded the number of papers published in previous years. The reason might be due to the Covid-19 pandemic which led to a significant expansion of distance education and electronic learning after the school and university closures, household quarantine, and social distancing policies. During the pandemic, higher education institutions were forbidden to continue traditional teaching activities and were forced to provide their educational programs through online platforms.[72, 73] On the other hand, today almost all people have access to smart phones and are able to use many programs and features of these devices for various reasons including work, entertainment, leisure and also knowledge acquisition.[74] Furthermore, our review found that the number of studies involving young adults was higher compared to those studying middle-aged and older adults. This might be due to the fact that young adults have the knowledge and skills of using mobile devices and are frequent users of this technology for various purposes such as entertainment, work and education.[75] Moreover, due to the widespread closure of universities amid COVID-19 pandemic, the use of mobile phones for educational purposes increased dramatically among college students who are generally in the young age group.[76]

In our review, 16 factors were identified to be crucial for the success of m-Learning. One of the most important factors was compatibility and user friendly, followed by tool readiness, availability of appropriate resources, motivation of learners, support and learning styles, and instructional design. This finding highlights the need for providing an accessible m-Learning platform by academic institutions to ensure the flexibility of learning anytime, and anyplace as well as connecting with other educators even from remote distances. Regarding internet access, education administrators especially in developing countries need to manage courses effectively and consider the necessary infrastructure such as Wi-fi, internet connection for applying mobile devices in their institutes.[77,78] Similar studies also mentioned technology-related problems as main barriers for effective mobile learning.[77-82] Regarding this category of problems, literature emphasized on key problems that might be evolved due to difficulty in Internet connections, inappropriateness of screen size and keyboard, inconveniences caused by accessories, and distractions during learning through mobile devices.[80,81,83,84]

The next imperative factor was blended learning. In this learning approach, instructors pay particular attention to instructional design, which includes trainees' analysis, objective identification, learning development, and instructional assessment.[85-93] In fact, trainers can benefit from online discussions on mobile devices for increasing learning communication and knowledge sharing between learners to improve learning outside traditional classrooms.[87,88,92-94] To apply effective strategies that motivate trainees to use their electronic devices for learning purposes, instructors should develop appropriate instructional design focusing on the identification of students' characteristics and learning styles, their educational needs, and motivation; determination of learning objectives and contents; provision of proper infrastructure and materials; coordination of interactive learning activities; and evaluation of learning activities.[95-106] Similarly, literature emphasized that trainers should consider learners', and other instructors' attitudes toward mobile learning approach,[29,30,44,107] their motivation,[28,35] or readiness to take up courses and fulfill them in an effective way.[28,62] Therefore, evaluating the course content, materials and tools, and study objectives should be mentioned as dominant factors for recognizing an operative approach for delivering content, coordinate learning activities, and

conduct following assessments. In the meantime, learners' characteristics should be considered in defining learning activities and evaluation strategies.[24] Moreover, due to an increasing pace of technological growth, instructors should create collaborative learning environments for empowering practical skills and mimicking actual work experiences.[39] Collaborative learning is regarded as the most common learning strategy that teachers apply through online tools utilizing mobile applications, video conferences and web applications in their courses.[33,34,39,48,49] Both proper content and user friendly design of the application are important for learners when choosing m-learning approach.[82,108]

Lack of fundamental skills in using mobile devices, and negative attitude of instructors towards applying mobile devices in education are among other important barriers to mobile learning.[109] Learners require some knowledge and skills for using applications in mobile devices, and maintain cyber security.[29,47,66] Instructors also need computer skills and some particular techniques to apply mobile devices in traditional classrooms.[37,48] When a new learning approach emerges, it brings about new condition, times and geographies to traditional classrooms. As a result, both teachers and students should be prepared to cope with an evolving technology and expand learning opportunities along with interactive learning methods comprised of investigation, discussion, explanation and lecturing.[1] Overall, it was found that in order to achieve a long-term success in m-learning, considering the mentioned factors is certainly essential. However, assessing the success factors for making the most of the benefits of m-learning by more detailed research into learners' demographics and regions revealed that middle-aged adults are the main users of mobile devices in sharing information and pursuing educational purposes. The significant role of such characteristics and individual success factors gives an indication to where the resistance to take-up actually occurs. Therefore, in this study we quantified the impact of each success factor in an accurate statistical term, and mentioned it as a relevant basis for designing future m-Learning instructions.

Study limitations. This study has a number of limitations which might have influenced the research. First, it does not include m-learning in primary or secondary school contexts, and its only covers the features of mobile learning in higher education contexts. Second, the review was limited to studies published in English; therefore, some relevant studies might not have been involved if they did not fit the language criterion. Considering the fact that there are still few studies that address the success factors of mobile devices in the area of education, the novelty of current study is that it provides a holistic view of the subject and conduct a systematic review and meta-analysis to organize the studies in terms of factors such as geographical regions, learner characteristics, and instructional design which could be important for educational success and early take-up.

Conclusion. The use of mobile learning enables the improvement of lifelong learning under any situation in the future. Study findings suggest that a successful mobile learning should include the investigation of trainees' educational needs and motivation; provision of adequate infrastructure and learning materials; definition of learning objectives and course contents; and coordination of appropriate learning activities in order to ensure a continuous progress in learners' knowledge and awareness on different course topics. Furthermore, education administrators should guarantee the availability of Internet connection and the appropriateness of mobile applications for enhanced learning activities. Instructors should also evaluate the effectiveness of m-learning approach regarding to different course topics and manage the existing barriers in an effective manner.

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Establishing a Partnership to Support an HIV Prevention Intervention for Latina Women in South Florida (United States of America)

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Establishing a Partnership to Support an HIV Prevention Intervention for Latina Women in South Florida Florida (United States of America)

Abstract

Objective. To describe practices used in the formation of a community-based participatory research (CBPR) partnership between M.U.J.E.R., a community-based organization located in South Florida, and the School of Nursing and Health Studies at the University of Miami (United States of America). The purpose of this partnership was to adapt SEPA -*Salud, Educación, Prevención, Autocuidado*; Health, Education, Prevention, Self-care, in English- into SEPA+PrEP -Salud, Educación, Prevención, Autocuidado + Profilaxis Pre-exposición; Health, Education, Prevention, Self-care + Pre-exposure prophylaxis, in English) to facilitate CBPR focused on HIV prevention among Latina women. **Methods.** Our community-based participatory research (CBPR) partnership blends multiple perspectives from community partners (community advisory board, community centers), clinical experts, cisgender heterosexual Latina members of the community, and academic/research members. **Results.** Partnering practices included (i) developing a collaborative and trusting partnership, (ii) relationship building and attending to power dynamics, (iii) building capacity through mutual learning, (iv) conducting research to address barriers to HIV prevention among Latina women, and (v) implementation of knowledge gained in future CBPR. **Conclusion.** The long-term success of our CBPR partnership should be measured by the capacity developed within the community and the successful implementation of community programming. Key Intentional implementation of CBPR partnership practices, tailored to academic and community institutions' unique needs, can result in high-trust, long-term relationships.

Descriptors: community-based participatory research, HIV, Hispanic or Latino women.

Establecimiento de una colaboración para apoyar una intervención de prevención del VIH dirigida a las mujeres latinas del sur de Florida (Estados Unidos de América)

Resumen

Objetivo. Describir las prácticas utilizadas en la formación de una colaboración de investigación participativa basada en la comunidad (CBPR) entre MUJER, una organización comunitaria ubicada en el sur de Florida y la Facultad de Enfermería y Estudios de la Salud de la Universidad de Miami. El propósito de esta colaboración fue adaptar SEPA -Salud, Educación, Prevención, Autocuidado- a SEPA+PrEP -Salud, Educación, Prevención, Autocuidado + Profilaxis Preexposición- para facilitar la prevención del VIH entre mujeres latinas. **Métodos.** Nuestra colaboración combina múltiples perspectivas de socios comunitarios (junta asesora comunitaria, centros comunitarios), expertos clínicos, miembros latinos heterosexuales cisgénero de la

comunidad y miembros académicos/de investigación. **Resultados.** Las prácticas de colaboración incluyeron (i) desarrollar una asociación colaborativa y de confianza, (ii) construir relaciones y atender las dinámicas de poder, (iii) desarrollar capacidades a través del aprendizaje mutuo, (iv) realizar investigaciones para abordar las barreras a la prevención del VIH entre mujeres latinas, e (v) implementar el conocimiento adquirido en futuras investigaciones. **Conclusión.** El éxito a largo plazo de nuestra colaboración se evidenció por la capacidad desarrollada dentro de la comunidad y la implementación exitosa de programas comunitarios. La implementación intencional de prácticas de colaboración CBPR, adaptadas a las necesidades únicas de las instituciones académicas y comunitarias, puede resultar en relaciones de alta confianza y a largo plazo.

Descriptores: investigación participativa basada en la comunidad, VIH, hispánicos o latinos, mujeres.

Estabelecimento de uma colaboração para apoiar uma intervenção de prevenção do HIV destinada a mulheres latinas no sul da Flórida (Estados Unidos da América)

Resumo

Objetivo. Descrever as práticas usadas na formação de uma colaboração de pesquisa participativa de base comunitária (CBPR) entre a MUJER, uma organização comunitária localizada no sul da Flórida, e a Faculdade de Estudos de Enfermagem e Saúde da Universidade de Miami. O objetivo desta colaboração foi adaptar SEPA - Saúde, Educação, Prevenção, Autocuidado - para SEPA+PrEP - Saúde, Educação, Prevenção, Autocuidado + Profilaxia Pré-exposição - para facilitar a prevenção do HIV entre mulheres latinas. **Métodos.** Nossa colaboração combina múltiplas perspectivas de parceiros comunitários (conselho consultivo comunitário, centros comunitários), especialistas clínicos, membros cisgêneros da comunidade latina heterossexual e membros acadêmicos/de pesquisa. **Resultados.** As práticas colaborativas incluíram (i) o desenvolvimento de uma parceria colaborativa e de confiança, (ii) a construção de relacionamentos e a abordagem da dinâmica de poder, (iii) a construção de capacidades através da aprendizagem mútua, (iv) a realização de pesquisas para abordar as barreiras à prevenção do HIV entre as mulheres latinas, e (v) implementar os conhecimentos adquiridos em pesquisas futuras. **Conclusão.** O sucesso a longo prazo da nossa colaboração foi evidenciado pela capacidade desenvolvida na comunidade e pela implementação bem-sucedida de programas comunitários. A implementação intencional de práticas colaborativas de CBPR, adaptadas às necessidades específicas das instituições acadêmicas e comunitárias, pode resultar em relacionamentos de alta confiança e de longo prazo.

Descritores: pesquisa participativa baseada na comunidade, HIV, hispânico ou latino, mulheres.

Introduction

Despite recent advancements in HIV prevention and care, HIV disproportionately affects people who self-identify as Hispanic/Latino/a/e/x (hereafter referred to as Latino) in the U.S.[1] According to the Centers for Disease Control and Prevention (CDC) statistics, Latina women in 2019 comprised almost 16% of the female population and represented 18% of new HIV diagnoses.[2] This rate is four times higher than non-Latina White women (5.3 vs. 1.7 per 100 000).[3] The disproportionate impact of HIV on Latino communities in the U.S. is caused by racism, discrimination, xenophobia, homophobia, and HIV-related stigma, as well as by economic inequality, a disjointed healthcare system, and other structural barriers.[4] "Ending the HIV Epidemic (EHE) in the United States: A Plan for America" is an initiative coordinated by the U.S. Department of Health and Human Services (HHS) to reduce new HIV infections by 90% by 2030. One EHE initiative focuses on enhancing prevention efforts, including promoting pre-exposure prophylaxis (PrEP) use and HIV testing.[5] CDC estimates that in 2019, only 10% of eligible women in the U.S. were prescribed PrEP,[7] with even lower estimates for Latina women.[6,7] These disparities underscore the urgent need for targeted HIV prevention interventions for this group.

In the context of determining how to address gaps in health disparities for Latina women, we formed a community-based participatory research (CBPR) partnership between a community-based organization (CBO) located in South Florida and the School of Nursing and Health Studies at the University of Miami (UM-SONHS), United States of América. This partnership aimed to adapt SEPA (Salud [Health], Educación [Education], Prevención [Prevention], Autocuidado [Self-care]) into SEPA+PrEP (Salud [Health], Educación [Education], Prevención [Prevention], Autocuidado [Self-care]) + Pre-Exposure Prophylaxis), a culturally grounded HIV prevention intervention that adapted SEPA, an evidence-based behavioral HIV prevention intervention. SEPA+PrEP is a culturally appropriate biobehavioral HIV prevention intervention for Latina women aged 18-49 to increase knowledge and initiation of PrEP, HIV testing, and condom use. SEPA+PrEP integrated SEPA, an evidence-based behavioral HIV prevention intervention, with PrEP. SEPA is grounded in two theoretical models: Bandura's Social Cognitive Model of Behavioral Change and Freire's Pedagogy,[8,9] and has been found to be effective in preventing or reducing sexual risk behaviors and depressive symptoms in randomized trials conducted among Latina women.[10-12] The SEPA intervention was developed and tested in 2000 in Chicago by Dr. Nilda Peragallo-Montano and her research team. Further, SEPA was implemented and tested in South Florida in 2007 and again in 2012 through a partnership between M.U.J.E.R. (Mujeres Unidas en Justicia, Educacion, y Reforma (Women United in Justice, Education & Reform); and UM-SOHNS. Despite its efficacy in reducing HIV risk behaviors, SEPA, as initially conceived, did not include content and activities on PrEP,

thereby motivating the adaptation of SEPA into SEPA+PrEP. In 2020, SEPA was adapted into SEPA+PrEP as part of a Miami Center for AIDS Research (CFAR) grant.[13] SEPA+PrEP can be defined as a supporting intervention culturally designed for cisgender heterosexual Latinas.[13] This intervention was adopted and implemented in South Florida, one of the jurisdictions where new HIV infections have been most concentrated.[14]

Nursing professionals play a pivotal role in addressing health disparities and advancing culturally sensitive healthcare practices. This article underscores the significance of a community-based participatory research (CBPR) partnership and describes practices used in the formation of a CBPR partnership to adapt SEPA into SEPA+PrEP to enhance HIV prevention among Latina women. By delving into the collaborative efforts between community organizations, clinical experts, and academic researchers, the article highlights essential practices for building trust, fostering mutual learning, and implementing culturally grounded interventions. These insights not only empower nurses to advocate for marginalized communities but also emphasize the importance of cultural competence and long-term sustainability in community health initiatives. Ultimately, this article provides insights for nursing professionals to integrate CBPR principles into their practice, ensuring effective and equitable healthcare delivery.

Methods

A CBPR approach was used to guide the formation and work of the partnership between the CBO and UM-SONHS to adapt SEPA into SEPA+PrEP for Latina women. CBPR is a participative approach that equitably involves community and academic stakeholders in the research process and recognizes the unique strengths that each brings.[15,16] Established in 1994, M.U.J.E.R. is a non-profit community-based social service organization in Homestead, Florida, that aims to improve the physical and emotional wellness of the rural community.[17] M.U.J.E.R. has earned recognition as a responsive agency by ensuring culturally sensitive services to minority communities in Homestead, South Florida.[17] Members from UM-SONHS brought expertise in health disparities, HIV prevention and care, working with minority groups, and women's health. Figure 1 describes the partnership and the stakeholders involved in the adaptation of SEPA into SEPA+PrEP. The parent study was approved by the Institutional Review Board of the University of Miami (IRB #20200856), and all subjects gave informed consent before data collection.

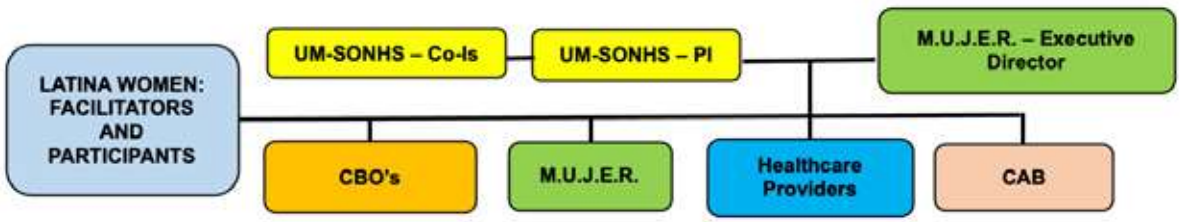

Figure 1. Partnership Between the M.U.J.E.R., UM-SOHNS, and Involved Stakeholders

Note. CAB= community advisory board; CBO= community-based organization; Co-Is= co-investigators; PI= principal investigators.

This article draws on information produced during the SEPA+PrEP partnership, including (i) reports required by the funders jointly written by community and research partners, (ii) meeting minutes, (iii) interviews with M.U.J.E.R. partners and other CBOs, (iv) focus groups with Latina women and (v) interviews with local healthcare providers. We explored how SEPA+PrEP embodied the core constructs of CBPR initially outlined by Israel *et al.*,[15] such as building on the strengths of the community, facilitating a collaborative exchange of knowledge and resources, and explicitly attending to power and privilege dynamics by co-creating, sharing decision-making and leveraging the diversity of experience of all partners.

Results

Developing a Collaborative and Trusting Partnership

SEPA+PrEP arose from partners' shared concern that Latina women in South Florida, influenced by cultural values and social determinants of health (SDoH), faced heightened HIV risk.[18] Responding to these concerns, the research team identified a community partner with an appropriate sphere of influence in Homestead, Florida. The team intentionally sought a partner with deep, active roots in the minority women's community, a trusted reputation, and regular active initiatives supporting community priorities. The partnership between M.U.J.E.R. and UM-SOHNS was initially established in 2006 by Dr. Nena Peragallo-Montano. Both organizations came together with a shared purpose and vision of addressing health disparities and empowering Latina women in Homestead and its surrounding communities in South Florida. This longstanding partnership has led to numerous successful projects that have positively impacted women's lives in these communities.[10-12] By combining their resources, expertise, and dedication, M.U.J.E.R. and UM-SONHS have implemented targeted initiatives to address the specific needs of Latina women led by Dr. Peragallo-Montano's mentee, Dr. Rosina Cianelli.

Over the years, this collaboration has taken various forms, including organizing health fairs, conducting door-to-door awareness campaigns, and obtaining grants from organizations such as the National Institutes of Health (NIH), the American Association of Colleges of Nursing (AACN), and the University of Miami CFAR. Additionally, the partnership has involved mentoring PhD students to become involved in the community (e.g., volunteering and working as research assistants) and use this site to conduct their dissertation research. The partnership has worked to identify the community's needs and priorities and has developed tailored interventions, integrating cultural elements into its approaches (community's beliefs, values, and traditions) to address the unique challenges experienced by Latina women. Throughout the collaboration, the partnership between M.U.J.E.R. and UM-SOHNS has achieved measurable outcomes and built meaningful relationships and trust within the community. By combining strengths, these entities have created a complimentary partnership that continues to evolve and adapt to the ever-changing healthcare landscape. Through collaboration, both organizations have demonstrated the power of teamwork and the possibilities that arise when common objectives, shared vision, and core values converge. Table 1 describes the partnership's vision, mission, and core values. M.U.J.E.R. and UM-SOHNS partnership has set an example for other alliances, inspiring similar relationships that strive to reduce health disparities and empower underserved communities. Figure 2 presents the timeline for the partnership between M.U.J.E.R. and UM-SOHNS.

Table 1. SEPA+PrEP Partnership Vision, Mission, and Core Values

Vision	Collaborate to build and provide science-based knowledge to decrease health disparities and empower Latina women to prevent HIV.
Mission	By employing rigorous research methods, our project aims to identify the specific HIV prevention requirements within the community. We tailor and test interventions that target the unique challenges Latina women encounter. In doing so, we strive to identify key stakeholders and establish partnerships that help us define and progress toward the development of a secure and trustworthy environment for Latina women. We recognize the crucial importance of providing culturally sensitive care throughout this process.
Core values	Our focus: minority women (Latina women) in South Florida Active inclusion and participation Cultural competence Empowerment Respect Confidentiality Health promotion and prevention to achieve health equity Trustworthiness Inclusion

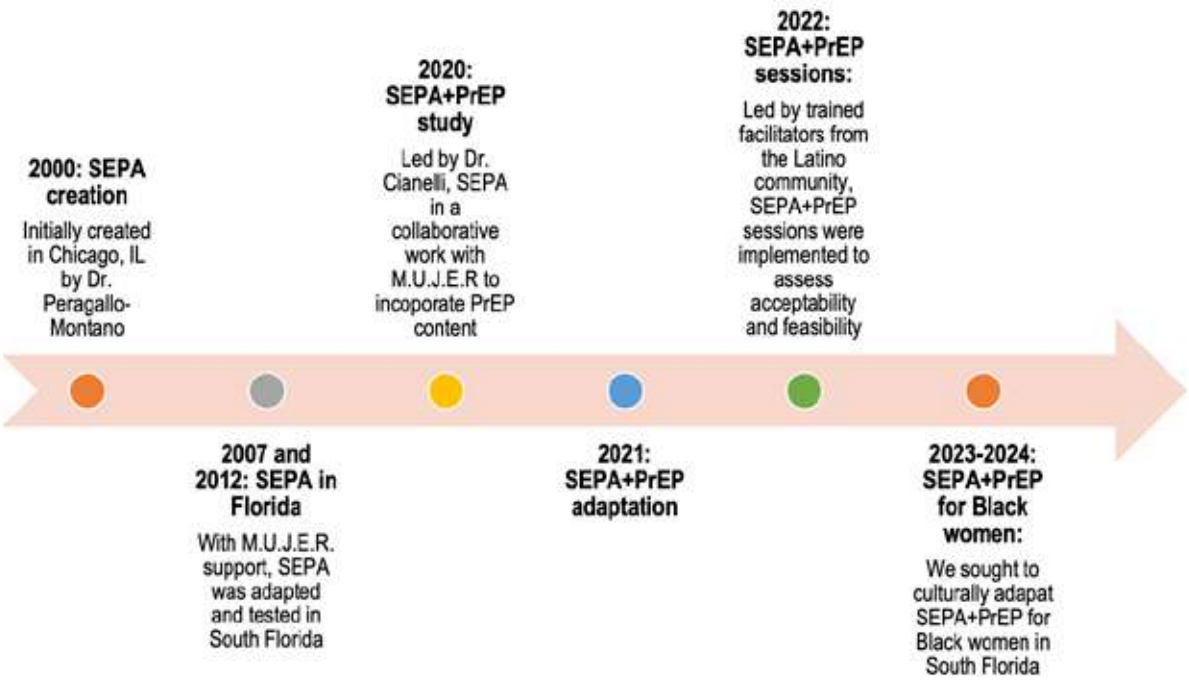

Figure 2. Timeline of the Partnership between M.U.J.E.R. and UM-SONHS

Note. M.U.J.E.R.=Mujeres Unidas en Justicia, Educacion, y Reforma (Women United in Justice, Education & Reform); SEPA= SEPA+PrEP (Salud, Educación, Prevención, Autocuidado); PrEP= Pre-Exposure Prophylaxis.

Relationship-Building and Attending to Power Dynamics

Team members have been mindful that resources must be equitably shared. M.U.J.E.R. and UM-SOHNS collaboratively participated in the SEPA+PrEP grant submission for Latina women, and both sites were encouraged to budget for the resources and staff needed to be successful. Though the partners are located in different county sections, team members intentionally tried to meet in person, when possible, for relationship building, leading to closer interpersonal connections and helping to build camaraderie among team members. Researchers respected that the community partner is the ultimate authority on minority women's work and encouraged them to make autonomous decisions about their interactions with the community of Latina women and budget management. At the same time, the integrity of the research process must be maintained, and the research must comply with the Institutional Review Board (IRB) procedures in which community members were certified. Simultaneously, researchers provided the project's scientific infrastructure (e.g., scientific instruments and equipment) to ensure that outcomes were measurable. Key partnering practices for the shared contributions included working with the community partner to develop proposals and adapt recruitment and retention plans.

Together with UM-SOHNS researchers, M.U.J.E.R. recognized the importance of involving other CBOs to expand the project's reach beyond the target population. This approach aimed to bring in different perspectives and foster a sense of community ownership. M.U.J.E.R. identified and initiated contact with two other CBOs that provide services to Latina women in Homestead, exploring their interest and collaboration capacity. M.U.J.E.R. and the research team discussed and determined which organizations would be good candidates to support the partnership. The next step involved visiting each CBO and meeting with their administrative leaders. During these meetings, researchers ensured the following aspects were discussed: (a) Project alignment with community needs: The study's objectives were clearly communicated, focusing on addressing specific community needs. This helped the researchers find organizations whose missions matched the project's goals. Understanding each organization's needs, demographics, and community relationships guided the team to identify experienced and credible partners, including those who had worked with M.U.J.E.R. before; (b) Inclusive stakeholder engagement: M.U.J.E.R. and UM-SOHNS held discussions with CBO stakeholders from Grupo Amor-Homestead and The Farmworker Association of Florida (La Asociación Campesina de Florida) to gather their perspectives on collaboration. This inclusive approach ensured that community workers' desires and preferences were considered in decision-making; (c) Assessing CBO values and capacity: The project evaluated CBOs' values, priorities, and track records to align with project goals. This included reviewing past projects, community involvement, and impact, as well as assessing organizational capacities such as infrastructure, staff expertise, and available resources; (d) Building trust through engagement: M.U.J.E.R. took the lead in building trust with identified organizations Grupo Amor-Homestead and The Farmworker Association of Florida (La Asociación Campesina de Florida). UM-SONHS researchers actively participated in CBO events and initiatives, engaging in open conversations with M.U.J.E.R. These efforts were vital in establishing trust and showing the project's commitment to ongoing collaboration for the community's benefit rather than a one-time commitment.

Building Capacity Through Mutual Learning

Building the capacity to conduct SEPA+PrEP successfully was a relevant, shared commitment by all the team members. To improve capacity building through collaborative work and reciprocal learning, weekly team meetings

were held to discuss research operations, and both partners contributed to accomplishing the study activities (e.g., recruitment, enrollment, and data collection). During the analysis and reporting results phase, both teams jointly contributed. However, the research team knew that partnership members have different skill sets, resulting in a need for different cross-training (e.g., human subject protection, research skills, and community engagement). Within the project's first year, community partners from M.U.J.E.R. collaborated on creating a 15-member CAB. This group met via Zoom® once a month for ten months to inform and guide the project about Latina women's HIV prevention needs, focusing on PrEP and potential adaptations of SEPA into SEPA+PrEP. The CAB comprised community members, including representatives of community organizations, healthcare providers, community leaders, and Latina women from the community. CAB members were identified in collaboration and input from the CBOs. Researchers provided training about HIV infection, PrEP, and the SEPA intervention to the CAB members.

Ten cisgender heterosexual Latina women from the community also participated in online focus groups. Latina women discussed HIV awareness in the community and highlighted the limited knowledge about HIV and the importance of including Latino cultural norms (e.g., machismo, marianismo), HIV, PrEP, and the use of female condoms in the adaptation of SEPA into SEPA+PrEP. Women emphasized that since men are often reluctant to use condoms, PrEP could offer Latina women more control over their sexual health and choices. A panel of content experts, including local healthcare providers, researchers, and faculty with expertise in working with Latina women, HIV prevention, and intervention development, provided recommendations for adapting SEPA into SEPA+PrEP. Interviews with healthcare providers who worked with Latina women yielded insights into HIV prevention, PrEP, and intervention elements. They emphasized the limited knowledge about HIV prevention and PrEP among Latina women, the community resources available, and the crucial role of community leaders and healthcare providers in facilitating PrEP access. One provider noted that accurate information about PrEP, delivered by a trusted source, could greatly improve its acceptance. "[Talking about PrEP] *I think, with the right and accurate information delivered by a trusted person, someone within the community, a leader, a thought leader, someone that is trusted."* Two bilingual Latina women from the community were selected to facilitate the SEPA+PrEP intervention for Latina women. Before initiating the SEPA+PrEP intervention, the facilitators received 8 hours of training conducted by the researchers: 4 hours of training on HIV and PrEP and 4 hours of training on implementing the three-session SEPA+PrEP intervention. Additionally, they completed the required IRB training from the Collaborative Institutional Training Initiative[19] so they could fully participate in the study.

Within the second year, the community facilitators delivered the culturally adapted SEPA+PrEP intervention in three weekly 2-hour sessions with small groups of 6-10 participants, 44 Latina women in total. Sessions were held in a private space at M.U.J.E.R. and included facilitated discussions, interactive feedback, role-playing, role modeling, rehearsal of communication skills, skill-building activities, and social interaction. The content and activities proposed by Latina women in the focus groups, the CAB, the CBOs, and healthcare providers were organized around these sessions. A detailed description of the SEPA+PrEP adaptation and its feasibility and acceptability are described elsewhere.[13] One of the core values identified in the partnership was recognizing that community partners and researchers can be both experts and novices. Likewise, having experts from the community (SEPA+PrEP facilitators) was recognized as a strength for those who participated in the SEPA+PrEP sessions. [The facilitator] *is from our community, and she speaks very well… She talked about her personal life, so we opened up a little more. I have been in other*

talks where it is more about the PowerPoint, and it is over... But she takes her time...to speak to you. And I loved about her. Additionally, Latina women who participated in SEPA+PrEP emphasized that interacting with other women during the sessions allowed them to gain greater knowledge by exchanging personal histories and points of view: *All this for me was very important because we learn from each other, and some tell their stories, and that is important because there are times when that is what it is about: learning from others.*

Research to Address Barriers to HIV Prevention Among Latina Women

Researchers and community members participated in community events to continuously identify health and service needs. The partnership took advantage of existing organizational events to recruit women for the sessions and to test the acceptability and feasibility of SEPA+PrEP through group sessions ($n=44$) and focus groups ($n=24$). The partnership suggested that building community and the inclusion of other community members, such as families (including men), would help break down cultural and gender scripts that place women at risk for HIV. Latina women in the group sessions and focus groups believed that involving more community members could help change social and cultural attitudes regarding sexuality, HIV prevention, and communication with partners.

Implementation of Knowledge Gained in Future CBPR

The SEPA+PrEP intervention was carefully assembled over two years, devoting time to building relationships rooted in operating agreements and defined partner roles. Participants suggested outreach strategies to involve more people to promote SEPA+PrEP in community locations such as schools, restaurants, and markets and deliberately share SEPA+PrEP content in the community. One participant, for example, suggested going to work settings: *I think you can find a place where people work and where you are allowed to go inside.* Another recommendation is to go to the local flea market: *I think, at the flea market, you will have your table with the things you want to show, and people will start coming.* Over the upcoming years, new funding enabled the partnership to adapt SEPA+PrEP for Black/African American women in South Florida communities. We continue working on the second phase of assessing the effectiveness and implementation of the adapted SEPA+PrEP for Latina women. Noteworthy, this next step emphasizes the need to continue and expand this partnership.

Discussion

SEPA+PrEP applied the principles of CBPR to address health disparities among Latina women in South Florida. Each of the organizations involved in this partnership had unique expertise but shared common interests in decreasing HIV disparities among minority women. Openness to a partnership with other CBOs led by M.U.J.E.R. (Grupo Amor-Homestead and The Farmworker Association of Florida (La Asociación Campesina de Florida) was key to achieving our common goal. The belief that community members' involvement in the development, adaptation, and management of community initiatives was vital to future implementation and sustainability. The sense of identity and emotional connection to others is essential to building community.[15] In the CBPR approach, this identification fosters a collaborative energy to develop an effective relationship between the different entities of the partnership. In this process, a shared recognition of HIV disparities among minority women bridged the strengths of M.U.J.E.R. and the research team. The challenge of providing a community solution to address the higher risk for HIV infection among the underserved communities in Homestead became the unit of identity. This common objective was the cornerstone to facilitate an ongoing collaboration, which evolved by engaging in mutual dialogue until a trusted partnership was reached. This dialogue was made possible

primarily through investing time and effort in identifying common goals and visions, honoring agreed commitments responsibly and effectively, and providing fair distribution of roles. Such dedication resulted in the successful adaptation of SEPA into SEPA+PrEP for Latina women, which increased the sense of community and identity, paving the way for the subsequent new project.

The longstanding community-academic partnership between M.U.J.E.R. and UM-SOHNS facilitated the identification of each party's strengths and resources and the interplay of these resources to result in a successful collaboration. As previously shown in the literature,[20,21] researchers combined their research infrastructure with UM-SOHNS's expertise in minority women's work and their concern about a specific healthcare issue. M.U.J.E.R. also possessed local and institutional knowledge and expertise in community perspectives, key gatekeepers, common languages, and a source of trust for the community, which were critical factors in successfully reaching the targeted communities and developing the proposed projects. By respecting and building on the community's strengths and resources, the community-academic team, and putting the effort together, a critical outcome was achieved: the SEPA+PrEP intervention was feasible and acceptable for Latina women.[13] Racial/ethnic disparities in HIV prevalence within U.S. Latino communities are influenced by SDoH, impacting HIV prevention and treatment.[22] SEPA+PrEP aimed to address these inequalities by empowering minority communities with knowledge. Through this intervention, participants forged connections with each other and with community partners, creating a reciprocal learning environment.[15] This collaborative effort between [M.U.J.E.R. and UM-SOHNS was guided by an ecological perspective, recognizing the multifaceted influences on individual and community health.[23]

The SEPA+PrEP intervention delved into various factors affecting the Latino community, including behavioral changes crucial for HIV and sexually transmitted infections prevention (such as partner negotiation skills, condom use, and PrEP). Additionally, environmental factors like social, economic, and physical aspects were explored before and during the study. In collaboration with community partners, the research team was well-versed in these factors specific to minority communities. The interdisciplinary CBPR team assessed how these communities' socioeconomic and physical factors interact. Our stakeholders (CAB, Latina women, and healthcare providers) worked closely with the academic team to understand and address these factors while implementing the intervention. This collaborative effort ensured that the SEPA+PrEP intervention was tailored to the specific needs and circumstances of the communities involved, fostering a holistic approach to HIV prevention and health promotion. Community partners and academic researchers were closely involved in each step of the research process during SEPA+PrEP. This included being involved from the study's inception to the dissemination of findings. Cyclical regular reviews of the research were conducted to ensure that everyone's input was included and that the study followed the process agreed upon at the beginning of the research.

This study's findings suggest meaningful ways to share research from the partnership between CBOs and academic institutions. Dissemination of findings is essential to CBPR[25] as it supports the partnership's sustainability. It is crucial to focus on this during dissemination to ensure the partnership continues beyond the study.[24,25] Additionally, sharing research can benefit both CBOs and academic institutions and promote mutual growth. For instance, academic institutions gain access to client populations for future research, while CBOs can prioritize meeting their clients' health needs, potentially leading to grants and publications.[24,25] CBPR connects researchers with CBO clinicians, allowing for collaborative knowledge creation benefiting the community.[26] Setting mutual goals for health

impact is crucial, especially when incorporating findings into clinical practice.[24] Likewise, CBPR can inspire future research ideas. Evaluations should be rigorous and practical, helping identify and overcome partnership gaps and barriers.[27] The model can also guide future partnerships with other CBOs through presentations in the community, sparking new research ideas and collaborations.

Implications for Nursing. The establishment of the SEPA+PrEP intervention partnership underscores the vital role of nursing professionals in bridging gaps in HIV prevention and care among Latina women in South Florida. Through the intentional application of CBPR principles, this initiative not only adapted the SEPA intervention to include PrEP but also cultivated a collaborative environment involving community partners, clinical experts, and academic researchers. This partnership highlights the importance of cultural competence, mutual learning, and trust-building in developing effective, sustainable healthcare interventions. Nursing practitioners can draw valuable insights from this model to advocate for and implement similar culturally grounded interventions, ensuring equitable healthcare delivery and empowering underserved communities. The SEPA+PrEP partnership sets a precedent for nursing practice and research, emphasizing the necessity of community engagement and tailored healthcare solutions in addressing health disparities.

Conclusion. This article described practices used in the formation of a CBPR partnership involving community partners, clinical experts, cisgender heterosexual Latina members of the community, and academic/researchers who participated in the adaptation of SEPA into SEPA+PrEP. Intentional implementation of CBPR partnership practices tailored to the unique needs and priorities of the community can result in high-trust, long-term relationships. The partnership described in this article has existed for over a decade, and the application of CBPR principles has strengthened the relationship over time. The long-term success of this CBPR partnership should be measured by the capacity developed within the community and the successful implementation of community programming.

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Original Article

Effectiveness of a Nursing Intervention to Improve Knowledge, Attitudes, and Practices in Malaria Prevention in an Emberá Katío Community in the Department of Córdoba

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Effectiveness of a Nursing Intervention to Improve Knowledge, Attitudes, and Practices in Malaria Prevention in an Emberá Katío Community in the Department of Córdoba

Abstract

Objective. To evaluate the effectiveness of a nursing intervention, against routine care, to improve knowledge, attitudes, and practices (KAP) in malaria prevention in an Emberá Katío community from the department of Córdoba, Colombia. **Methods.** This was an intervention study with quasi-experimental design with control group, conducted in three phases: (I) design of the educational intervention, (II) content validation of the educational intervention through expert judgment, and (III) execution of a quasi-experimental study with two groups: experimental (n = 60) and control (n = 58). The intervention consisted in four modules taught in person, using educational strategies, like classes, guided discussions, workshops, and a booklet designed for the study. The control group received the routine care provided by the Secretariat of Health. The study used the instrument by the Pan-American Health Organization "Survey on knowledge, attitudes, and practices in addressing malaria in indigenous communities" to measure pre- and post-intervention scores. **Results.** The four modules of the educational intervention obtained Content Validity Indices between 0.83 and 0.90 that are considered adequate. The General Linear Models of repeated measures showed positive effect of the educational intervention on the KAP scores ($p < 0.001$), with an effect size of 91% in knowledge, 49% in attitudes, 85% in practices, and 93% in the total score. **Conclusion.** The educational intervention proved effective to improve KAPs in malaria prevention in the Emberá Katío community from the department of Córdoba.

Descriptors: malaria; health knowledge; attitudes; practice; indigenous peoples; transcultural nursing.

Efectividad de una intervención de enfermería para mejorar conocimientos, actitudes y prácticas en la prevención de la malaria en una comunidad emberá katío del departamento de Córdoba

Resumen

Objetivo. Evaluar la efectividad de una intervención de enfermería, frente a la atención rutinaria, para mejorar los conocimientos, actitudes y prácticas (CAP) en la prevención de la malaria en una comunidad emberá katío del departamento de Córdoba, Colombia. **Métodos.** Estudio de intervención con diseño cuasiexperimental con grupo control, realizado en tres fases: (I) diseño de la intervención educativa, (II) validación del contenido de la intervención educativa mediante juicio de expertos, y (III) ejecución de un estudio cuasiexperimental con dos grupos: experimental (n = 60) y control (n = 58). La intervención consistió en cuatro módulos impartidos presencialmente, utilizando estrategias educativas como clases, discusiones

guiadas, talleres y una cartilla diseñada para el estudio. El grupo control recibió la atención rutinaria proporcionada por la Secretaría de Salud. Se utilizó el instrumento de la Organización Panamericana de la Salud "Encuesta sobre conocimientos, actitudes y prácticas en el abordaje de la malaria en comunidades indígenas" para medir los puntajes pre- y post-intervención. **Resultados.** Los cuatro módulos de la intervención educativa obtuvieron Índices de Validez de Contenido entre 0.83 y 0.90 que se consideran adecuados. Los modelos lineales generales de medidas repetidas mostraron un efecto positivo de la intervención educativa en los puntajes de CAP ($p < 0.001$), con un tamaño del efecto del 91 % en conocimientos, 49 % en actitudes, 85 % en prácticas y 93 % en el puntaje total. **Conclusión.** La intervención educativa demostró ser efectiva para mejorar los CAP en la prevención de la malaria en la comunidad emberá katío del departamento de Córdoba.

Descriptores: malaria; conocimientos; actitudes y prácticas en salud; pueblos indígenas; enfermería transcultural.

Eficácia de uma intervenção de enfermagem para melhorar conhecimentos, atitudes e práticas na prevenção da malária em uma comunidade Embera Katío no departamento de Córdoba

Resumo

Objetivo. Avaliar a eficácia de uma intervenção de enfermagem, comparada aos cuidados de rotina, para melhorar conhecimentos, atitudes e práticas (CAP) na prevenção da malária em uma comunidade Embera Katío, no departamento de Córdoba, Colômbia. **Métodos.** Estudo de intervenção com desenho quase experimental com grupo controle, realizado em três fases: (I) desenho da intervenção educativa, (II) validação do conteúdo da intervenção educativa por meio de julgamento de especialistas, e (III) execução de um estudo quase experimental com dois grupos: experimental ($n = 60$) e controle ($n = 58$). A intervenção consistiu em quatro módulos ministrados presencialmente, utilizando estratégias educativas como aulas, discussões orientadas, oficinas e uma cartilha elaborada para o estudo. O grupo controle recebeu cuidados de rotina fornecidos pelo Ministério da Saúde. O instrumento da Organização Pan-Americana da Saúde "Pesquisa sobre conhecimentos, atitudes e práticas no enfrentamento da malária em comunidades indígenas" foi utilizado para medir as pontuações pré e pós-intervenção. **Resultados.** Os quatro módulos da intervenção educativa obtiveram Índices de Validade de Conteúdo entre 0.83 e 0.90, considerados adequados. Modelos lineares gerais de medidas repetidas mostraram efeito positivo da intervenção educativa nos escores do PAC ($p < 0.001$), com tamanho de efeito de 91% para conhecimento, 49% para atitudes, 85% para práticas e 93% para escore total. **Conclusão.** A intervenção educativa revelou-se eficaz na melhoria do PAC na prevenção da malária na comunidade Embera Katío do departamento de Córdoba.

Descritores: malária; conhecimentos; atitudes e prática em saúde; povos indígenas; enfermagem transcultural.

Introduction

Malaria or paludism is a potentially deadly disease caused by protozoans of the genus *Plasmodium,* transmitted to humans through the bite from female mosquitos from the genus *Anopheles*.[1] This disease is the most-common parasitic infection in the world with 249-million cases notified and 608 000 deaths due to this cause in 2022.[2] Colombia is no stranger to this problem, with 102,455 cases of paludism registered in 2023, of which one in every four affected belonged to indigenous communities.[3] For the same year, the department of Córdoba notified 15150 cases of malaria, with Tierralta being one of the municipalities most affected.[4] In this municipality, located in the Alto Sinú region, the settlement of the Emberá Katío people is located, with 48,117 indigenous people in Colombia, thus, representing 2.7% of the country's indigenous population.[5]

When analyzing the literature related with strategies used for malaria prevention and the consequential decrease of this disease's incidence, it is noted that surveys about knowledge, attitudes, and practices (KAP) permit determining in a population the degree of knowledge about malaria, as well as the attitudes and practices that contribute to its transmission; with the results from these surveys being highly important because they can be used to design educational interventions in indigenous communities.[6] Examples of the foregoing are the KAP surveys conducted in Venezuela,[7] Panama,[8] and Colombia,[9,10] which showed that culturally adapted educational interventions improved not only knowledge, but achieved changes in attitudes and practices to diminish the risk of suffering this disease.[11] In this sense, the Pan-American Health Organization[12] recognizes that an intercultural approach promotes equal treatment of the different cultural groups. Likewise, it considers health a fundamental right, advising that health professionals, among them those from nursing, must lead educational activities with communities to promote integration of traditional KAPs regarding the disease. In this study, the concept of cultural competence was taken from the nursing discipline, which permitted articulating and testing empirically the assumptions or theoretical proposals selected from the model proposed by Rachel Spector.[13] Similarly, in the literature review, prior to the development of this research, a void was identified in knowledge related to what would be the effectiveness of an educational intervention for malaria prevention focused on KAPs, constructed bearing in mind the cultural issues of care, incorporating in its design theoretical elements from cultural competence. This gave way to conducting this study that sought to evaluate the effectiveness of a nursing intervention against routine care to improve KAPs in malaria prevention in indigenous people of the Emberá Katío ethnic group of the department of Córdoba.

Methods

The study was carried out in three stages:

Stage 1- Design of the educational intervention
From the review of articles about educational interventions to improve KAPs regarding malaria prevention in indigenous communities, an educational intervention was designed that was initially presented to the leaders of the community object of study, who provided their input and knowledge and which were incorporated to the final intervention. This educational intervention was structured into four modules to be administered in an equal number of face-to-face sessions, once per week and lasting three hours per session. The contents addressed per session were: (i) Definition of the disease, its signs and symptoms, (ii) Forms of the infection, (iii) Breeding sites of the vector, and (iv) Preventive actions to reduce the risk of infection. Each module was designed employing educational strategies, such as master classes, guided discussions, workshops, drawings, and use of a printed booklet, designed bearing in mind the observations made by indigenous authorities from the Emberá Katío community, who were consulted to know their perceptions and suggestions about the intervention. (Link to the booklet https://drive.google.com/file/d/13MqOIgE6XrpMdaA4a4irFAnjseTdRsoJ/view?usp=drive_link) Each educational session began with a welcome greeting and assessment of prior knowledge, then the planned theme was developed and, finally, an activity was assigned to be developed at home and socialized during the following session.

Stage 2 – Content validation of the educational intervention through expert judgment
Thirteen experts participated in this process. They met the inclusion criteria of being professional in any health science or social science discipline, having a graduate degree, and fulfilling one of the following two criteria: (i) having at least two years of experience in malaria prevention and treatment in teaching and research areas, or (ii) having work experience with indigenous communities. It was considered that the intervention had adequate content validity with the following Content Validity Indices per criteria: 0.83 in clarity, 0.90 in pertinence, 0.81 in relevance, and 0.88 in coherence. The observations and recommendations by the experts were considered for the intervention adjustments. The outcomes of this stage were described in detail and are published in a Nursing journal in Colombia.[14]

Stage 3 - Quasi-experimental study with control group
This type of study was chosen due to the randomization difficulty to assign the participants to the intervention and control groups due to the cultural characteristics and geographic location of the Emberá community; a situation that facilitated contamination with information from the study itself provided to the intervention group to those who would be assigned to the control group. Likewise, it was not possible to guarantee participant blinding because the informed consent detailed the activities that would be carried out in the intervention and control groups. It was also not possible to blind the evaluator, who was the principal researcher and knew the participants' membership in the groups.

The study population was comprised by people who lived in the Alto Sinú region of the municipality of Tierralta, department of Córdoba (Colombia). The following defined the inclusion criteria: age ≥ 18 years, being an inhabitant of the region, and belonging to the Emberá Katío ethnic group. Exclusion criteria were: not attending one or more of the sessions programmed to receive the intervention, incomplete answer in at least 20% of the questionnaire, and voluntary withdrawal from the study. Initially, and through the social contact strategy, the leaders and senior indigenous authorities were summoned, through the Association of Councils of Alto Sinú. They granted permission to enter the area and suggested choosing the settlements of El Rosario and San Clemente from the eight that make up the indigenous reservation of Alto Sinú (Tierralta,

Department of Córdoba, Colombia) due to having less traffic of actors in the armed conflict living in the area and, therefore, less risk to the safety of researchers and participants. This reason defined the sampling as intentional type. To calculate the sample difference between two proportions, the formula by Fleiss *et al*., was used,[15] bearing in mind the statistical parameters: rate of individuals from the intervention group to the control group of 1:1, 95% significance level, and 80% power. The proportions of knowledge about malaria were assumed at 84% in the control group versus 96% in the group receiving an educational intervention for malaria prevention in the study by Alvarado *et al.*;[9] under these conditions, the minimum sample size was 52 individuals per group.

As for the assignment of the two indigenous communities to intervention or control groups, it was done by the coin toss method, leaving the San Clemente resettlement as the intervention group (IG) and El Rosario as the control group (CG). During the participants' enrollment procedure, the indigenous leaders acted as mediators between the researcher and the members of the communities selected. During the time the research took place, both study groups continued receiving routine care, considering such as the set of activities provided regularly and in planned manner that health services providing institutions offer to their users.[16] For this case, it was the care provided by the Municipal Health Secretariat from the municipality of Tierralta, consisting of health education, thick blood sample collection campaigns, and placement of posters in areas of greatest affluence. Additionally, the intervention group was administered the educational intervention in four sessions, each lasting three hours; the control group received one session with the summary of the content from the intervention upon completing the study. The activities conducted in each of the groupsare detailed in the box below.

Description of the activities provided to the intervention and control groups

Group		Description
Intervention	Control	
Enrollment	Enrollment	Prior to starting the intervention, informed consent was explained and signed, and sociodemographic data were collected.
First KAP measurement	First KAP measurement	All the participants had the first KAP measurement regarding malaria prevention.
Application of Module 1	Routine care	Week 1. Development of the first module of the educational intervention: *Knowing malaria*
Application of Module 2	Routine care	Week 2. Development of the second module of the educational intervention: *How can we get sick from malaria?*
Application of Module 3	Routine care	Week 3. Development of the third module of the educational intervention: *Where can the malaria mosquito grow?*
Application of Module 4	Routine care	Week 4. Development of the fourth module of the educational intervention: *How can I prevent malaria?*
Second KAP evaluation	Second KAP evaluation	Week 5. All the participants had the second KAP measurement regarding malaria prevention.
No activity	Application of the intervention summary	Week 6. The control group received the summary of the contents of the educational intervention during a single session and were given the booklet.

The instrument used to measure KAP was *The KAP Survey on addressing malaria in indigenous communities,* which is composed by 45 questions contained in seven components: 1-general sociodemographic data, 2-knowledge, 3-attitudes, 4-practices, 5-perceptions against malaria, 6-access to the health services network, and 7-community participation. This scale has been validated in indigenous population in Colombia, having a Cronbach's alpha of 0.72.[17] The instrument was applied with all the participants in both communities selected, through reading the questions individually. The intervention of an interpreter of the Emberá language was not necessary, because all the participants spoke and understood Spanish.

The information obtained in the study was analyzed with the SPSS program v.29. To compare between groups of the baseline sociodemographic variables and the KAPs evaluations at the PRE-PRE and POST-POST moments, Student's t test was used for two independent samples for quantitative variables, and the Chi-squared test for qualitative variables. In the case of the latter, the Yates correction was applied if any of the expected values were ≤ 5. To compare the PRE-POST intragroup difference of the KAPs, Wilcoxon's non-parametric signed-rank test for two related samples was used.

General Linear Models (GLM) of repeated measures were constructed to assess the effect of the educational intervention on the possible intervening variables to improve KAPs. Variables with intragroup PRE and POST intervention measurement were defined as repeated measures factor. The intra-subject factor was the group variable (0 = control and 1 = experimental); and, to control the effect of possible confusion, covariables: age, sex, years of education, and years living in the location were introduced into the models.

Given that the instrument 'KAP survey on addressing malaria in indigenous communities' does not have a scoring system,[6] it was decided add up the questions correctly answered in three of the components: knowledge ($n = 8$), attitudes ($n = 6$), and practices ($n = 10$). The same was not done with the items of the components access to the health services network and community participation because these are questions that are perceptions about activities conducted by individuals different from those surveyed; these questions were kept to preserve comparability with other studies where this instrument has been used.

The statistic to test the null hypothesis related with the effect of the time factor (PRE and POST intervention measurements) on improving KAPs in the study groups was Pillai's trace, assuming a probability value < 0.05 to reject the null hypothesis and conclude that the explicative variable (intervention) has significant effect on the values of the response variables, PRE and POST intervention measures. Mauchly's test of sphericity showed in all the GLM carried out in this research a value of 1.0, implying that the assumption of sphericity was fulfilled.[18]

The partial Eta squared was used to evaluate the size of the effect. This value varies from 0 to 1, where values closest to 1 indicate a higher proportion of variance that can be explained by a given variable in the model after taking into account the variance explained by the other variables; its interpretation is: small $(0.01\text{-}0.05)$, medium $(0.06\text{-}0.13)$, and large (≥ 0.14).[19] Statistical significance was considered for all tests used in the statistical analysis if the probability value was < 0.05. A pilot test was conducted with 10% of the sample size (20 indigenous individuals who did not participate in the study groups) to evaluate preliminarily the intervention regarding possible difficulties to deploy the intervention and the key methodological aspects, like enrollment and information collection. The measurement instrument to evaluate necessary adjustments for its semantic adequacy was applied to the participants of this phase, identifying the need to include in the questions that had the word "malaria" the option "or paludism" because some people manifested knowing this disease by this name.

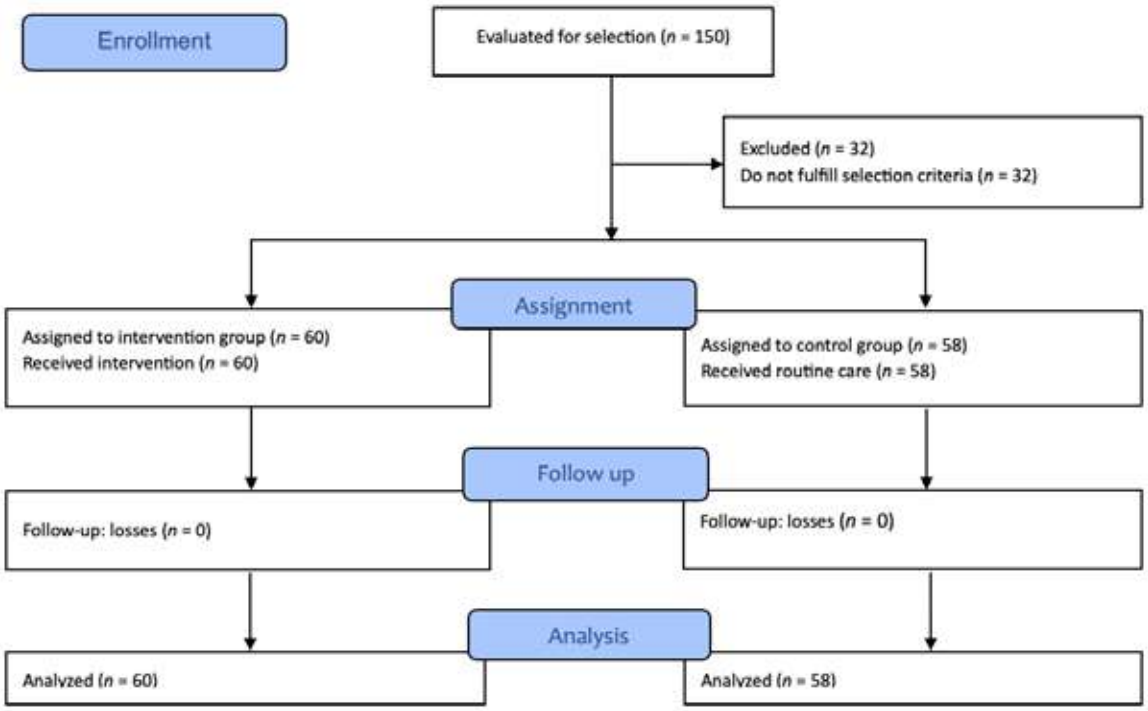
After deploying the educational intervention in the experimental group, its acceptability was valued with 11 items that assess compliance of the categories: suitability (n = 2), convenience (n = 1), effectiveness (n = 2), health risk (n = 1), adherence (n = 1), and form of delivery (n = 4), proposed by Sidani and Braden (20). These questions were answered through self-report and in person by 20 of the 58 indigenous participants (34.5%). This survey used Likert-type response options, thus: 1-Not acceptable at all; 2-Somewhat acceptable; 3-Acceptable; 4-Quite acceptable; 5-Totally acceptable. It was found that each of the items evaluated a maximum average value of 5 and a minimum value of 4.

The Project was approved by the Research Ethics Committee of the Faculty of Nursing at Universidad de Antioquia through Act N.º CEI-FE 2021-37. During its execution, the ethical principles governing human research were guaranteed and, according with Resolution 8430 of 1993, it was classified as minimum-risk research. Informed signed consent was obtained from the participants and permission was provided by the Association of Indigenous Councils of Alto Sinú. Additionally, suggestions made by community members were taken into account during the planning of the educational intervention. This study was registered in ClinicalTrials.gov with Identifier: NCT06590597.

Results

During the enrollment carried out in the resettlements of El Rosario and San Clemente, 150 people interested in participating in the research were evaluated. Of this total, 32 were excluded for not fulfilling the established inclusion criteria, thus, 118 people participated (60 in the intervention group – resettlement of San Clemente - and 58 in the control group – resettlement of El Rosario-). There were no losses during follow up (Figure 1)

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



As per the sociodemographic characteristics of the participants, no statistically significant differences were found in most of the variables between the study groups; the exceptions were in some of the variables of household information. Table 1 shows that the following characteristics prevailed for all: average age of 37.43± 9.49 years (minimum = 20; maximum = 57), female sex (78%), common-law marital status (61.0%), and affiliation to the subsidized health regime (77.1%). With respect to schooling, the average number of years of study was 11.5±2.9 (minimum = 3; maximum = 18), and in relation to time in the location, the study found an average of 28.6±13.9 years (minimum = 3; maximum = 55). Regarding occupation, being a housewife prevailed (49.2%). In relation to information about the household, cement floors predominated (92.4%), but there were significant differences in the type of roof made of fiber cement tiles (IG = 51.7% and CG = 97.7%), and on the type of cement block wall (IG = 43.3% and CG = 94.8%).

Regarding public utility services, all the households from both groups had electric power and natural gas and lacked sewage service. Significant difference was evidenced in the availability of internet service (IG = 40% and CG = 19%), likewise in the potable water service (IG = 75% and CG = 94.8%); with the main source of water for consumption being the rural aqueduct in both groups. Upon analyzing the information on the lifetime prevalence of malaria, it was of 39.8% for all the participants, with statistically significant difference ($p < 0.001$) between the groups (IG = 63.3% and CG = 15.5%). With respect to annual prevalence of malaria, it was estimated in IG = 3.3% and CG = 3.4%. None of the participants from the groups reported death of relatives due to malaria during their lifetime.

Table 1. Description of the total sociodemographic variables and according to study group

Variables	Group		Total (n = 118)	Test statistic	p-value
	Intervention (n = 60)	Control (n = 58)			
Age in years; Mean ±SD	36.1±9.9	38.8±8.9	37.43±9.49	-1.600‡	0.056
Female sex; *n* (%)	45 (75%)	47 (81%)	92 (78%)	0.625*	0.429
Marital status; *n* (%)				2.017*	0.365
Single	14 (23.3%)	11 (19%)	25 (21.2%)		
Married	13 (21.7%)	8 (13.8%)	21 (17.8%)		
Common-law	33 (55%)	39 (67.2%)	72 (61%)		
Health affiliation; *n* (%)				5.482*	0.064
Contributive	17 (28.3%)	8 (13.8%)	25 (21.2%)		
Beneficiary	0 (0%)	2 (3.4%)	2 (1.7%)		
Subsidized	43 (71.7%)	48 (82.8%)	91 (77.1%)		
Years of schooling; Average ±SD	11.7±3.0	11.2±2.9	11.5±2.9	0.831‡	0.204

Table 1. Description of the total sociodemographic variables and according to study group (Cont.)

Variables	Group		Total (n = 118)	Test statistic	p-value
	Intervention (n = 60)	Control (n = 58)			
Years in the location; Average ±SD	26.9±14.1	30.4±13.7	28.6±13.9	-1.352‡	0.90
Currently working *n* (%)	59 (98.3%)	58 (100%)	117 (99.2%)	0.000†	1.000
Occupation *n* (%)				8.424*	0.297
Agriculture	3 (5%)	9 (15.5%)	1 (0.8%)		
Cattle raising	3 (5%)	4 (6.9%)	7 (5.9%)		
Day laborer	2 (3.3%)	0 (0%)	2 (1.7%)		
Various jobs	5 (8.3%)	8 (13.8%)	13 (11.0%)		
Worker	2 (3.3%)	3 (5.2%)	5 (4.2%)		
Housewife	33 (55%)	26 (44.8%)	58 (49.2%)		
Other	12 (20%)	8 (13.8%)	20 (16.9%)		
Information about housing					
Type of roof; *n* (%)				27.797*	< 0.001
Plant or palm	10 (16.7%)	1 (1.7%)	11 (9.3%)		
Zinc	19 (31.7%)	2 (3.4%)	21 (17.8%)		
Fibrous cement	31 (51.7%)	55 (94.8%)	86 (72.9%)		
Type of wall; *n* (%)				39.360*	< 0.001
Wood	6 (10%)	3 (5.2%)	9 (7.6%)		
Cement block	26 (43.3%)	55 (94.8%)	81 (68.6%)		
Brick	27 (45%)	0 (0%)	27 (22.9%)		
Guadua	1 (1.7%)	0 (0%)	1 (0.8%)		
Type of floor; *n* (%)				0.411†	0.522
Cement	54 (90%)	55 (94.8%)	109 (92.4%)		
Wood	6 (10%)	3 (5.2%)	9 (7.6%)	-	-
Public services in the dwelling					
Natural gas	58 (96.7%)	56 (96.6%)	114 (96.6%)	< 0.001†	1
Electricity	60 (100%)	58 (100%)	118 (100%)	-	-
Internet at home	24 (40%)	11(19%)	35 (29.7%)	6.254*	0.012

Table 1. Description of the total sociodemographic variables and according to study group (Cont.)

Variables	Group		Total (n = 118)	Test statistic	p-value
	Intervention (n = 60)	Control (n = 58)			
Trash collection	0	0	-	-	-
Drinking water	45 (75%)	55 (94.8%)	100 (84.7%)	8.969*	0.003
Sewage	0	0	-	-	-
Origin of the water; *n* (%)				8.969*	0.003
Rural aqueduct	45 (75%)	55 (94.8%)	100 (84.7%)		
Well	15 (25%)	3 (5.2%)	18 (15.3%)		

*: Pearson's $\chi 2$; †: $\chi 2$ with Yates continuity correction; ‡: Student's t

POST-test results between groups

Upon applying the second measurement, there was statistically significant difference in most of the KAP variables, with the percentages being better in the IG compared with the CG, for which emphasis will be made on aspects where there was no difference.

Knowledge. After applying the second measurement, statistically significant difference was observed in most of the variables in this domain, with the percentages in the IG being better, except for the variables: *recognition of bodily pain as a symptom of malaria* (IG = 95% vs. CG = 86.2%; p = 0.101*), malaria is cured: with the treatment provided by the health institution* (IG = 100% vs. CG = 96.6%.; p = 0.461) or by *going to a pharmacy* (IG = 0% vs. CG = 1.7%; p = 0.986); and in the questions: *what can be done for a person not to get malaria,* in the items of: using insect netting (IG = 100% vs. CG = 98.3%; p = 0.986), fumigate with insecticides (IG = 100% vs. CG = 98.3%; p = 0.986); and in the item that the mayor should also help to prevent malaria (IG = 5% vs. CG = 1.7%; p = 0.635).

Attitudes. It was observed that in two of the six questions in this domain no statistically significant difference was noted, although clarifying that both came with high percentages since the PRE-test measurement: *do you agree with spraying insecticides in your house?* (IG = 100% vs. CG = 98.3%; p = 0.986) and *do you consider that malaria is a problem for you and your family?* (IG = 100%; vs. CG = 98.3%; p = 0.986).

Practices. Only this question of the ten that make up this domain did not have statistical difference: *do you use artificial repellents against mosquitos?* (IG = 11.7% vs. CG = 1.7%; p = 0.075).

Intragroup PRE- and POST-test results

Knowledge. All participants from both groups knew what malaria was, both during the PRE-test and POST-test. In the rest of the questions from this section, statistically significant difference was found exclusively in the intervention group,

indicating improved knowledge in the variables: *mechanism of malaria transmission* – through water, person to person, and through mosquito bite – (PRE = 46.7% vs. POST = 100%; $p < 0.001$), *symptoms a person with malaria may have* – pain, on the body, weakness and fatigue, chills and vomiting – (PRE = 35% vs. POST = 100%; $p < 0.001$), *tests made to know if someone has malaria* – blood sample – (PRE = 48.3% vs. POST = 100%; $p < 0.001$), *how is malaria cured* – taking the treatment provided by the health institution- (PRE = 65% vs. POST = 100%; $p < 0.001$), *actions to prevent people from getting malaria* – avoid stagnant waters, use insect netting over beds, keep the household clean, avoid going out at night, use clothing for protection – (PRE = 45.0% vs. POST = 93.3%; $p < 0.001$), *who should prevent malaria* – the family, neighbors, community in general – (PRE = 53.4% vs. POST = 95%; $p < 0.001$) and, finally, in the variable: *do you know the name of the mosquito that transmits malaria?* (PRE = 13.3% vs. POST = 91.7%; $p < 0.001$).

Attitudes. There was exclusive improvement in the intervention group for the variables: *do you think a person with malaria should take the whole treatment?* (PRE = 70.0% vs. POST = 100%; $p < 0.001$); *do you agree with spraying insecticides in the house* (PRE = 61.7% vs. POST = 100%; $p < 0.001$); *do you agree with the following activities to prevent malaria?* (statistical difference in all activities) (PRE = 36.7% vs. POST = 100%; $p < 0.001$); and, finally in the variable: *do you consider that malaria is a problem for you and your family?* (PRE = 68.3% vs. POST = 100%; $p < 0.001$) In addition, the attitude was maintained related to the variable: *when someone has malaria where should they go?* Of respondents, 75% preferred health services 75% and 15% consults with the Jaibaná.

Practices. It was possible to note exclusive improvement in the IG for the items that make up this domain, except for the use of natural repellents and burning of plants to repel mosquitos, each of them with 11.7% in both measurements.

Results of GLM

In all the GLM of repeated measures conducted for the score factors of knowledge, attitudes, practices, and for total KAP, the assumption of sphericity was fulfilled. All the models were significant ($p < 0.01$). The size of the effect, measured by the partial Eta squared statistic, indicating the change in the sum of the questions correctly answered in the educational intervention, was 91% in knowledge, 48.9% in attitudes, 85.8% in practices, and 93.5% of the total KAPs (Table 2).

Table 2. Tests of intra-subject effects in the Linear Regression Models of repeated measures for factor scores of knowledge, attitudes, practices, and total KAP

Origin		Type III sum of squares	GL	Root mean square	F	*p*-value	Partial Eta Squared
Factor = Knowledge score							
Factor	Assumed sphericity	2.36	1	2.362	7.22	0.008	0.061
Factor * Group	Assumed sphericity	370.182	1	370.182	1132.360	< 0.001	0.910
Error (factor)	Assumed sphericity	36.614	112	0.327	-	-	-
Factor = Attitude score							
Factor	Assumed sphericity	0.063	1	0.063	0.313	0.577	0.003
Factor * Group	Assumed sphericity	21.436	1	21.436	107.340	< 0.001	0.489
Error (factor)	Assumed sphericity	22.367	112	0.200	-	-	0.200
Factor = Practices score							
Factor	Assumed sphericity	0.205	1	0.205	0.678	0.412	0.006
Factor * Group	Assumed sphericity	204.168	1	204.168	676.297	< 0.001	0.858
Error (factor)	Assumed sphericity	33.812	112	0.302	-	-	-
Factor = Total KAP score							
Factor	Assumed sphericity	3.025	1	3.025	3.327	0.071	0.029
Factor * Group	Assumed sphericity	1456.090	1	1456.090	1601.598	< 0.001	0.935
Error (factor)	Assumed sphericity	101.825	112	0.909	-	-	-

Regarding pairwise comparisons, it was found that statistically significant differences exist among the average total of questions correctly answered, as well as for each of the factors, between the IG and CG, with average scores being higher in the IG (Table 3).

Table 3. Pairwise comparisons of the difference in the number of questions correctly answered per factor between the intervention group and the control group

Factor	Number of questions	Differences of intra-group means		Difference of means	*p*-value *	95% CI difference*	
		IG	CG			LL	UL
Knowledge score	8	5.66±0.07	3.12±0.08	2.54±0.07*	< 0.001	2.39	2.68
Attitude score	6	3.57±0.04	3.00±0.07	0.54±0.07*	< 0.001	0.37	0.66
Practices score	10	5.32±0.52	3.41±0.06	1.91±0.07*	< 0.001	1.76	2.10
Total KAP score	24	14.50±0.15	9.58±0.15	4.92±0.12*	< 0.001	4.66	5.17

(*) Bonferroni adjustment; (95% CI) 95% Confidence Interval; (LL) Lower limit; (UL) Upper limit.

Discussion

This research found that in most baseline sociodemographic conditions no statistically significant differences existed between the study groups, except for some variables related with housing, which permitted their comparison. Majority participation by women in the study and their occupation as housewives can be explained by the distribution of activities within the families. In this dynamic, men are dedicated to obtaining economic resources and food, as well as participating in political activities, while women are in charge of caring for the children, animals, and the household.[21] It is possible that these responsibilities make them more prone to participating in these types of events and feeling responsible for putting into practice at home what has been learned. With respect to education, the average global number of years of schooling was 11.5 years, which in Colombia would be related completing secondary education,[22] being higher than that reported in indigenous population in Colombia, where almost half the people had as maximum level complete primary education.[5]

Regarding the housing characteristics, cement floors predominated with differences in the types of roofs and walls between the groups. In the control group, greater use of fiber cement tiles and cement blocks was found. These disparities could be explained by the proximity of the El Rosario resettlement (control group) to the urban perimeter, which facilitates obtaining these types of materials. This also evidences the westernization of constructions in these communities, which could be related with the relocation of the Emberá Katío people due to the construction of the Urra I hydroelectric. This relocation meant uprooting their lands, customs, and ancestral knowledge.[23] This finding also agrees with that described by the National Administrative Department of Statistics (DANE, for the term in Spanish),[5] which shows that 60.8% of the dwellings with indigenous heads of household were built as houses, while only 30% lived in traditional indigenous housing. With regards to public utility services, greater availability of Internet service was found in the intervention group and drinking water in the control group. The foregoing is related with that described by some inhabitants of the zone, who indicated that currently projects are being executed, such as satellite Internet, rural aqueducts, and improvements in tertiary roads, which are more advanced in some populations than in others.

With respect to information on cases of malaria, the experimental group reported a lifetime prevalence four times that reported by the control group. Nonetheless, the annual prevalence was $< 4\%$ in both groups. This difference may be justified by the lower permanent availability of drinking water in the intervention group, which obligates them to store water in containers that are possible breeding sites of the malaria vector.

Moving on to the information from the repeated measures GLMs, the positive effect of the educational intervention was shown, which explained the variance in improving the score of correct answers by 91% in knowledge, 49% in attitudes, 85% in practices, and 93% in the total KAP score. These results coincide with those reported by other studies that observed significant changes in KAP scores with respect to interventions for malaria prevention in indigenous communities.[7,9,24]

Although the results in this study evidence the benefits of the intervention to improve KAPs in malaria prevention, it is important to note that lower changes were noted in the scores in the attitudes factor, a situation also found by Balami *et al*.[25] When specifically reviewing this factor in our study, it was found that questions about whether they agreed with the actions of filling puddles with soil and drilling holes in objects that could retain water, among the measures to prevent malaria, these improved little. Likewise, the practices factor also showed little change in using fans to repel mosquitos, applying artificial repellents, and wearing clothing to protect against bites.

This finding could not be contrasted with other research, given that results reported by authors who conducted educational interventions to improve KAPs in malaria prevention in indigenous communities did not document specifically the actions evaluated in the factors of attitudes and practices, pre and post-intervention.[7,9,24]

However, researchers have indicated that human behavior may be influenced by social, cultural, economic, and political factors, which – in turn – can increase or diminish the risk of suffering a disease.[6] In this sense, the low percentages observed in activities related with the attitudes factor could be explained by the influence of these factors. At the same time, the little change in activities, like using fans, applying artificial repellents, and wearing clothing that protects against bites could be attributed to the low wages earned by families in the area.[5] This condition reduces the possibility to acquire elements, like fans, commercial repellents, and clothing with special characteristics to avoid the vector's bite. The foregoing creates a scenario in which the different players in charge of actions to promote and maintain health must adopt strategies aimed at strengthening these types of activities through supporting the acquisition and teaching the use of implements mentioned in malaria prevention. Further, the finding on the use of apparel coincides with the practice of wearing traditional Emberá clothing, a custom kept by some members of the community.[26]

Also, with respect to the practices factor, in the experimental group and the control group, it was possible to identify that some participants manifested the practice of burning leaves from plants, like 'matarratón' (*Gliricidia sepium*) to repel mosquitos and as natural repellents. This practice was maintained in both groups both during the pre and post-test. This is related to the customs and cultural roots of the Emberá that are still present in the area, especially with the figure of the Jaibaná and use of traditional medicine, which includes using plants to cure and prevent diseases transmitted by vectors.[26,27]

These results coincide with that stated by other authors[28,29] regarding the need to understand health phenomena and care practices within the cultural context of people, as well as that proposed by health organizations, like the PAHO,[12] an entity that recognizes the importance of facing ethnic, social, and cultural diversities, and of bridging existing gaps when considering the peculiarities and needs of these groups by the health systems of its member states. Due to the aforementioned, the work of nursing professionals should be aimed at guaranteeing equitable access to health services, respecting values and cultural beliefs, safeguarding the needs of these population groups.[30,31]

Under this vision, levels of self-efficacy and cultural competence of nursing professionals must be improved in the Colombian context, through promoting cultural knowledge as a mechanism to promote culturally competent care.[32] The challenge continues being the need to create protocols and implementation plans on knowledge, sensitivity, awareness and cultural competence, as well as these types of educational interventions. This is why the importance is highlighted of the role of the nursing discipline in the face of the phenomenon of globalization of health care, where it is increasingly expected for professionals in the area globally to come in contact with patients, families, and colleagues from diverse cultures and origins,[33] interaction that represents humanized care and adjusted to the cultural peculiarities of each person and community.

Finally, this research has implications for the nursing practice, given that the knowledge generated herein can serve as referent when planning care in similar contexts as that developed by this study. Besides, this research contributes a validated and effective educational intervention to improve the KAP regarding malaria prevention in a vulnerable group,

like the Emberá Katío community from the municipality of Tierralta in Córdoba, Colombia. Moreover, inclusion of theoretical assumptions from transcultural nursing represents a substantial contribution to the nursing discipline in research methodological aspects, as well as to the development of care actions culturally sensitive with the reality of people.

To conclude, it can be stated that the educational intervention was effective in improving knowledge, attitudes, and practices for malaria prevention in an indigenous population of the Emberá Katío ethnicity from the department of Córdoba, Colombia. Nevertheless, it is needed to evaluate its effectiveness in similar contexts and continue the design of research that address specific aspects of the domains of attitudes and practices, such as the elimination of vector breeding sites and the use of repellents.

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Construction and Validation of a Compassionate Nursing Care Scale from the Perspective of the Patient-Family Caregiver Dyad

Original Article

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Construction and Validation of a Compassionate Nursing Care Scale from the Perspective of the Patient-Family Caregiver Dyad

Abstract

Objective. This work sought to determine the composition, comprehensibility, face validity, and content validity of the Compassionate Care Scale "HUS-CC", to assess the perception of the patient-family caregiver dyad on the compassionate nursing care they receive in hospital services. **Methods.** Methodological research conducted in a hospital network with services at different levels of complexity in Colombia. To evaluate the comprehensibility of the HUS-CC, 204 individuals participated. The face and content validity were valued by 17 experts and ratified with 213 dyads. An exploratory factor analysis with varimax rotation was conducted and reliability was calculated with Cronbach's alpha. **Results.** The scale was clear and understandable. Its face and content validity index were 0.77; the Fleiss Kappa index was 0.59 and Aiken's V was 0.9; with Cronbach's alpha of 0.84. The HUS-CC has 16 items grouped into three dimensions: warm treatment, inclusive attitude, and supportive behavior. **Conclusion.** The HUS-CC scale proved valid to evaluate the perception of patient-family caregiver dyads about compassionate nursing care in hospital services.

Descriptors: nursing methodology research; empathy; nursing care; quality of health care; nursing theory.

Construcción y validación de una escala de cuidado compasivo de enfermería desde la perspectiva de la díada paciente-cuidador familiar

Resumen

Objetivo. Determinar la composición, comprensibilidad, validez facial y validez de contenido de la Escala de Cuidado Compasivo "HUS-CC", para evaluar la percepción de la díada paciente-cuidador familiar sobre el cuidado compasivo de enfermería que reciben en servicios hospitalarios. **Métodos.** Investigación Metodológica desarrollada en una red hospitalaria con servicios de diferente nivel de complejidad en Colombia. Para valorar la comprensibilidad de la HUS-CC, participaron 204

personas. La validez facial y de contenido fue valorada con 17 expertos y ratificada con 213 diadas. Se realizó un análisis factorial exploratorio con rotación varimax y se calculó la fiabilidad con el alfa de Cronbach. **Resultados.** La escala fue clara y comprensible. Su índice de validez facial y de contenido fue de 0,77; el índice Kappa de Fleiss de 0,59 y el V de Aiken de 0,9. El alfa de Cronbach fue de 0,84. La HUS-CC tiene 16 ítems agrupados en tres dimensiones: trato cálido; actitud incluyente y conducta de apoyo. **Conclusión.** La escala HUS -CC demostró ser válida para valorar la percepción de las díadas paciente-cuidador familiar sobre el cuidado compasivo de enfermería en servicios hospitalarios.

Descriptores: investigación metodológica en enfermería; compasión; atención de enfermería; calidad de la atención de salud; teoría de enfermería.

Construção e validação de escala de cuidados de enfermagem compassivos na perspectiva da díade paciente-familiar cuidador

Resumo

Objetivo. Determinar a composição, compreensibilidade, validade facial e validade de conteúdo da Escala de Cuidado Compassivo "HUS-CC", para avaliar a percepção da díade paciente – cuidador familiar sobre o cuidado de enfermagem compassivo que recebe nos serviços hospitalares. **Métodos.** Pesquisa metodológica desenvolvida em uma rede hospitalar com serviços de diferentes níveis de complexidade na Colômbia. Para avaliar a compreensibilidade do HUS-CC participaram 204 pessoas. A validade facial e de conteúdo foi avaliada com 17 especialistas e ratificada com 213 díades. Foi realizada análise fatorial exploratória com rotação Varimax e a confiabilidade foi calculada com alfa de Cronbach. **Resultados.** A escala era clara e compreensível. Dele o índice de validade facial e de conteúdo foi de 0.77; o índice Fleiss Kappa de 0.59 e o Aiken V de 0.9. O alfa de Cronbach foi de 0.84. O HUS -CC possui 16 itens agrupados em três dimensões: tratamento caloroso; atitude inclusiva e comportamento de apoio. **Conclusão.** A escala HUS-CC mostrou-se válida para avaliar a percepção das díades paciente-cuidador familiar sobre o cuidado compassivo de enfermagem em serviços hospitalares.

Descritores: investigação metodológica em enfermagem; compaixão; cuidados de enfermagem; qualidade dos cuidados de saúde; teoria de enfermagem.

Introduction

Compassionate care is that which is provided consciously and from a bond with a suffering person who is sought to be relieved; this care requires a reflection and action process by the caregiver.[1] It is also a way of expressing the transcendence of the human condition.[2] In the health field, caring compassionately has permitted to improve interpersonal relations generating positive impact between health providers and its users.[3]

For nursing, providing compassionate care implies that its service has attributes, like wisdom, humanity, and empathy and that these are expressed in front of people who are vulnerable or suffering.[4] This type of care requires for nurses, in addition to knowledge and skills, to maintain warm and friendly communication through actions, such as a smile, holding hands, looking and actively listening, an appropriate tone of voice, a good sense of humor, or any expression on their part that takes into account the culture and respect for patients and their family caregivers.[5] To identify the needs of the people in their care, understand their health beliefs and facilitate the contribution that they themselves can make to promote and recover their health and well-being, it is important for nurses to involve patients and their family caregivers, to be available when their services are required, offer timely care, supervise the evolution and development of tasks under their care, and ensure that the care and context in which it is provided respond to what its users require and expect.[6] In addition, training in compassionate care is associated with better nursing performance, which can support the recovery, satisfaction, and experience of patients and their family caregivers during their time in the health institution.[7] In that sense, knowing the experience of patients and their family caregivers is important for the nursing staff because it allows them to assess the care during hospitalization and, thus, carry out activities that can improve the quality and safety of care, including greater cooperation, agreement, and decisions about care plans, along with their implementation and evaluation.[8]

Several tools have been developed to evaluate compassionate nursing care, these include the Compassion Competence Scale – an self-report instrument on compassionate nursing competence that reports a Cronbach's α of 0.91, has 17 items, and includes the dimensions of communication, sensitivity, and knowledge.[9] The Compassion Scale that values the perception of patients about the comprehensive concern for their suffering and inclination to help them; it reports a Cronbach's α of 0.94 and includes the characteristics: cold/warm, unpleasant/pleasant, distant/compassionate, insensitive/sensitive, and indifferent/affectionate.[10] The Compassionate Care Assessment tool that evaluates holistically in-hospital nursing care, with Cronbach's α of 0.81 and 28 items grouped into the dimensions of significant connection, patient's expectations, attributes of care, and professional capacity.[11] The Schwartz

Center Compassionate Care Scale, which measures patients' perspectives about compassionate care by the health staff during hospitalization, is one-dimensional, has 12 items, reports Cronbach's α of 0.76 – 0.95, and includes empathic concern and care and tenderness for those who suffer.[12] The Sinclair Compassion Questionnaire that measures patients' reports about compassionate care; it is one-dimensional with 15 items and Cronbach's α of 0.96. Its authors consider it the Gold Standard for this measurement.[13] Also, complementing the previous compassionate care measurement tools, there is the Compassion Practice Scale that, unlike the previous scales, seeks to evaluate to what extent a hospital fosters compassionate care in its employees; it is one-dimensional and includes five items and a Cronbach's α of 0.82.[14]

Despite progress in measurements of compassionate care applicable to the practice by nursing and other professionals, No clinical tools were found in the world literature that consider the perception of compassionate care by patient-family caregiver dyad as a subject of care. Also, no reports exist of compassionate care tools that have been validated in Latin America. In that sense, this study sought to determine the composition, comprehensibility, and face and content validity of the HUS-CC tool that evaluates the perception of patient-family caregiver dyads about the compassionate nursing care they receive in Colombian hospital services.

Methods

This was a nursing methodological research carried out in a teaching-care alliance, which sought the construction and validation of an instrument to measure compassionate nursing care from the perspective of patient-family caregiver dyads. It was developed by phases, thus:

Phase 1. Identification of the need and development of the tool to measure the perception by the patient-family caregiver dyad on the level of compassionate nursing care. The Nursing Professional Practice model that guides the Hospital Universitario de la Samaritana (HUS) network, where this study took place, seeks leadership by nursing in compassionate and safe care. The subject of care are the patient-family caregiver dyads. According with its goals, the level of compassionate care perceived by the dyads must be measured to maintain or improve it continuously. To develop the compassionate care scale, a literature review was conducted with support from the EUREKA metasearch engine that includes 35 databases, like PubMed and SciELO and in CINAHL with the following search formula: [(Patient OR Caregiver OR Dyad) AND (Compassionate Care OR Compassion OR Compassionate Nursing) AND (Assessment OR Assessment Tool OR Evaluation)]. Dates, languages, or geographic sites were not limited. Of the 442 studies reported, 110 were selected from the title and abstract to be fully reviewed. Of those, 47 articles were considered due to their contribution to this study. Based on the identified need and the literature review, the research group developed a proposal of a scale to measure the perception of the patient-family caregiver dyad on the level of compassionate care provided by nursing.

Phase 2. Assessment of the scale's comprehensibility level. The level of clarity of the proposed scale was revised by 204 people, patients or family caregivers, with different degree of schooling, socioeconomic status, age, and gender. Each person was asked through a questionnaire in Google Forms if each of the items on the proposed scale was understandable or not, asking them to make the observations they deemed necessary in front of each question. The degree of comprehensibility of the items was determined by calculating the percentages obtained, where a percentage > 85% was considered high comprehensibility.[15] If the item did not fulfill that criterion, it's wording was revised and adjusted.

Phase 3. Face and content validity of the scale. The scale was validated through the judgment of 17 national or foreign experts who fulfilled the following criteria: having command of Spanish, being professionals with a graduate degree in any field of health or social areas related to care, and having more than five years of experience working with care issues. Each expert received a validation form together with the proposed scale and independently evaluated such, keeping in mind four criteria: clarity, relevance, coherence, and sufficiency of each item and dimension. In each case, they were asked to score in a Likert scale if the criterion was not met, 1; if there was a low level of compliance, 2; if the level of compliance was moderate, 3; and if there was full compliance, 4. Thereafter, these results were incorporated onto an Excel spreadsheet and analyzed under Lawshe parameters modified by Tristán,[15] weighting their content validity ratio (CVR) per item and the content validity index (CVI) for the scale as a whole. According with these parameters, agreement among experts with values > 0.582 was accepted.[16] Then, Aiken's V (AV) index was calculated to quantify item relevance with respect to the domains, accepting levels > 0.75 as valid.[17] Lastly, the Fleiss Kappa index was calculated to assess reliability among evaluators, whose level of agreement was valued as follows: 0.00 poor, from 0.1 to 0.20 slight, from 0.21 to 0.40 acceptable, from 0.41 to 0.60 moderate, from 0.61 to 0.80 considerable, and from 0.81 to 1.0 almost perfect.[15]

Phase 4. Construct validity and reliability of the scale. Once the scale was adjusted and validated by the experts, it was applied to a group of 213 dyads who were receiving services in the hospital network and who accepted to participate by responding voluntarily. The results were entered into an Excel database and, subsequently, validated with the Jamovi Tool to perform an exploratory factor analysis after measuring the Kaiser Meyer Olkin (KMO) and Bartlett's sphericity assumptions.[18] The maximum likelihood with varimax rotation was used as the extraction method. The reliability of the scale was evaluated by calculating Cronbach's alpha, which was interpreted as follows: from 0.01 to 0.20 very low, from 0.21 to 0.40 low, from 0.41 to 0.60 moderate, from 0.61 to 0.80 high, and from 0.81 to 1.00 very high.[19]

Ethical aspects. The study received informed consent from the participants and was endorsed by the institutions involved after reviewing ethical and environmental aspects (Act No. 003140319).

Results

Phase 1. Identification of the need and development of the scale to measure the perception of the patient-family caregiver dyad about the level of compassionate nursing care. From the literature review, it was possible to identify the characteristics and dimensions that reflect compassionate care in the nursing practice and which were present in the different evaluation tools reported. With this input, the preliminary version was generated of the Compassionate Care Scale denominated HUS-CC, for the acronym of the Hospital Network in which it was developed. This version included 16 items distributed into five dimensions: prioritizes the person with three items, treats warmly with three items, educates for care with four items, models care with three items, and facilitates care with three items.

Phase 2. Assessment of the scale's comprehensibility level. The participants' characteristics reflected their heterogeneity. Of this group, 79% were women and 21% men. Their educational level was of primary for 7.4%, high school for 11.3%, technical or technological formation for 47.1%, professional formation for 29.9%, and graduate formation for 4.4%. Their socioeconomic level according to the housing strata was low (strata 1 to 3) in 96.6% and high (strata 4 to 6) in 3.4%. The comprehensibility tests of the HUS-CC scale showed results between 87.7 % and 100%,

thus, no semantic adjustments were required in the items proposed.

Phase 3. Face and content validity of the scale. From the concept by the experts about the scale, a CVR was found between 0.65 and 0.92 and CVI of 0.77 for the total test. Aiken's V index was 0.90, with values fluctuating between 0.81 and 0.98 (Table 1).

Table 1. Content validity analysis of the HUS-CC scale conducted by the 17 experts

Item	Analysis according to Lawshe parameters					Analysis according to Aiken parameters				
	Clarity	Relevance	Coherence	Suffi-ciency	CVR	Clarity	Relevance	Coherence	Suffi-ciency	Sub-total
1	0.82	0.94	0.88	0.68	0.83	0.92	0.96	0.94	0.89	0.93
2	0.47	0.88	0.82		0.71	0.76	0.96	0.92		0.89
3	0.52	0.82	0.82		0.71	0.76	0.92	0.92		0.87
4	0.70	0.94	0.88	0.76	0.82	0.88	0.96	0.94	0.92	0.93
5	0.94	1	1		0.92	0.98	1	1		0.98
6	0.94	1	1		0.92	0.98	1	1		0.98
7	0.82	0.70	0.70	0.52	0.69	0.88	0.74	0.80	0.81	0.81
8	0.88	0.82	0.82		0.76	0.94	0.82	0.88		0.87
9	0.58	0.82	0.94		0.72	0.80	0.86	0.94		0.84
10	0.88	0.88	0.94	0.63	0.83	0.96	0.96	0.98	0.86	0.94
11	0.70	0.88	0.88		0.77	0.9	0.90	0.92		0.90
12	0.64	0.94	0.94		0.79	0.88	0.96	0.92		0.90
13	0.82	0.88	0.94		0.82	0.92	0.94	0.98		0.93
14	0.52	0.7	0.76	0.60	0.65	0.80	0.88	0.90	0.87	0.86
15	0.58	0.88	0.82		0.72	0.84	0.96	0.94		0.91
16	0.64	0.88	0.82		0.74	0.88	0.96	0.94		0.91
n = 17	CVI 0.77					AV 0.90				

Table 2 shows the strength of agreement among evaluators for the HUS-CC scale, which was 0.59 for the total. The dimensions of Treats warmly and Educates for care obtained the highest values with 0.79 and 0.63, respectively.

Table 2. Strength of agreement among evaluators for the HUS-CC scale

Dimensions	Attributes				Fleiss Kappa Coefficient	Strength of agreement
	Clarity	Relevance	Coherence	Sufficiency		
Prioritizes the person	0.34	0.72	0.62	0.45	0.53	Moderate
Treats warmly	0.73	0.95	0.91	0.56	0.79	Considerable
Educates for care	0.57	0.75	0.82	0.39	0.63	Considerable
Models care	0.55	0.54	0.62	0.32	0.51	Moderate
Facilitates care	0.35	0.62	0.58	0.42	0.49	Moderate
Total	0.51	0.72	0.71	0.43	0.59	Moderate

Phase 4. Construct validity and scale reliability. The resulting version of the HUS-CC was applied to 213 patient-family caregiver dyads from the three institutions that make up the Hospital Network where the study was conducted. Kaiser's exploratory factor analysis was 0.83. The correlation of the HUS-CC scale, evaluated with Bartlett's sphericity test indicated significance < 0.001, which permitted rejecting the null hypothesis and proceeding to the factor analysis. Upon regrouping the items with the exploratory factor analysis, the final version was generated of the HUS-CC scale with 16 items distributed in three dimensions: 1) warm treatment, with eight items; 2) inclusive attitude, with four items; and 3) supportive behavior, with four items (Table 3).

Table 3. Exploratory factor analysis of the HUS-CC scale

Category	Item	Factor		
		1	2	3
Warm treatment	Calls them by their name	0.553		
	Recognizes them as persons	0.544		
	Serves them with priority	0.335		
	Respects them	0.448		
	Listens to them attentively	0.343		
	Treats them kindly (warmth)	0.489		
	Is patient with them	0.426		
	Inspires confidence in them	0.718		
Inclusive attitude	Explains the procedures carried out		0.584	
	Involves them in care		0.678	
	Teaches them about care		0.789	
	Asks about what he/she has taught them		0.636	
Supportive behavior	Sets an example with his/her care behavior			0.498
	Accompanies them permanently			0.730
	Facilitates care when it is complex			0.554
	Supports them during treatment and recovery			0.443

As overall instructions before starting the questionnaire, patients, caregivers, or family participants were told: "Please indicate your level of agreement with each of the following statements based on the care you have received from the institution's nursing staff. Indicate in each case if you totally agree, partially agree, disagree, or completely disagree with each of them". Finally, the HUS-CC scale had a Cronbach's alpha of 0.84, indicating its high reliability.

Discussion

The HUS-CC scale, designed and validated, shows essential elements that characterize compassionate nursing care. Among them, those proposed by Burnell who states that compassion in care is the outcome of an authentic bond between a nurse and a patient that must reflect comprehension and sensitivity to the distressing reality and suffering of the recipient of care and generate actions that seek to alleviate such.[20] Similarly, it reflects the characteristics proposed by Taylor *et al*., as care characterized by recognition, connection, and an altruistic impulse desire with humanistic responses and actions.[21] It also takes into account the call by Llarde *et al*., for compassionate care to besides being the fundamental characteristic in the quality of nursing care or a distinctive seal of a theoretical model, it should be the result of a genuine connection during nursing care that must – in turn – focus on the patients that demand it, considering their perception.[22] As evidenced, the HUS-CC scale

includes the warm treatment, inclusive attitude, and supportive behavior by nurses during care.

The view of compassionate care from different perspectives including patients or their family caregivers, individually or as dyad, complements contributions like that made by Diaz *et al*., who evaluated compassionate care from the perspective of students as caregivers[23] and by Papadopoulos *et al*., who assessed this care from the opinions by nurses from 15 countries.[24] However, as indicated by these authors, putting compassionate nursing care into practice needs further research to explore not only different perspectives but also their differences in different cultures.

Compassionate care in nursing, as reflected by the HUS-CC scale, is essentially comprised of soft skills that must be measured to evidence and improve them, as noted in the works by Lee and Seomun;[9] Fogarty *et al*.;[10] Burnell *et al*.;[11] Lown *et al*.,:[12] and Sinclair *et al*.[13] The evaluation of the attributes of compassionate care achieved through this scale, responds to the proposals by Llarde *et al*., who indicate that although the concept of compassionate care is central in the nursing practice, the measurement or improvement of this type of care is not evident in this practice.[22]

To end, this development responds to the proposal by McClelland and Vogus,[14] contributing to the measurement of compassionate care in different scenarios and levels of care. However, it is a limitation of the present study that the scale does not allow measuring compassionate care from the nurse's perspective as an indispensable part in the construction of the care bond. Hence, it is necessary to continue studying to design a scale that can be used with nursing to assess its perspective about its capacity to offer compassionate care. Likewise, it will be necessary to also respond – as indicated by Colletti *et al*.,[25] to the institution's responsibilities, which as a university hospital it has in relation to training, with an analysis of the impact this scale or its adaptation may have on the development of human talent skills.

The HUS-CC constructed through a teaching-nursing assistance alliance and designed to be applied to patients, family caregivers or the dyad, by a previously trained healthcare worker, permits visualizing, measuring, and improving the compassionate nursing care practice and could be useful to enhance formation in this field. This scale is constituted by three categories that include warm treatment, with eight items; inclusive attitude, with four items; and supportive behavior with four items. It is measured via a four-option Likert scale that includes totally agree, partially agree, partially disagree, and totally disagree. Its validation reflected that it is a clear and understandable scale, with adequate content and structure to be applied in Colombian population.

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Intention, Motivations, and Barriers to Emigration of Nursing Students in Colombia

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Intention, Motivations, and Barriers to Emigration of Nursing Students in Colombia

Abstract

Objective. To explore the intention, motivations, and barriers to emigrate of final semester nursing students from Colombia. **Methods.** Quantitative, descriptive, and cross-sectional study with participation by 556 last-semester students matriculated in 26 undergraduate nursing programs in Colombia. Data were collected through an online questionnaire. **Results.** The study found that 84% of the participants consider among their plans as future nursing professionals to emigrate to practice their profession in another country. Destinations of preference for those who have thought of emigrating include countries, like Canada (63.5%), Spain (57.7%), Germany (44.9%), and the United States (44.4%). The main reasons that motivate nursing students to emigrate when they complete their professional studies are: better remuneration (81.6%), better quality of life (67.9%),

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Conflicts of interest: No

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greater professional growth (64.1%), greater job stability (54.7%), and more employment options (49.8%). In turn, the reasons that discourage nursing students from emigrating when they complete their professional studies are: language (71.9%), going away from the family (60.6%), and the complexity of the emigration process (55.4%). **Conclusion.** The findings of this research show that a notable proportion of last-semester nursing students consider among their plans to emigrate to practice in another country when they receive their degree. Knowing the intentions, motivations, and barriers to emigrate of future nurses will permit having elements to design strategies that improve the retention of professionals in Colombia.

Descriptors: emigration and immigration; nursing students; nursing schools; health workforce; working conditions; Colombia.

Intención, motivaciones y barreras para emigrar de estudiantes de enfermería en Colombia

Resumen

Objetivo Explorar la intención, motivaciones y barreras para emigrar de estudiantes de último semestre de enfermería de Colombia. **Métodos.** Estudio cuantitativo, descriptivo y de corte transversal con participación de 556 estudiantes de último semestre matriculados en 26 programas de pregrado de Enfermería en Colombia. Los datos se recolectaron a través de un cuestionario en línea. **Resultados**. El 84 % de los participantes considera dentro de sus planes como futuros profesionales de enfermería emigrar para ejercer la profesión en otro país. Los destinos de preferencia para quienes han pensado emigrar incluyen países como Canadá (63.5%), España (57.7%), Alemania (44.9%) y Estados Unidos (44.4%). Las principales razones que motivan a los estudiantes de enfermería a emigrar cuando culminen sus estudios profesionales son: mejor remuneración (81.6%), mejor calidad de vida (67.9%), mayor crecimiento profesional (64.1%), mayor estabilidad laboral (54.7%) y más opciones de empleo (49.8%). Por su parte, las razones que desmotivan a los estudiantes de enfermería a emigrar cuando culminen sus estudios profesionales son: el lenguaje o idioma (71.9%), alejarse de la familia (60.6%) y la complejidad del proceso para emigrar (55.4%). **Conclusión.** Los hallazgos de esta investigación muestran que una apreciable proporción de los estudiantes de enfermería de último semestre consideran dentro de sus planes emigrar para ejercer en otro país cuando

cuenten con su título. El conocimiento de las intenciones, motivaciones y barreras para emigrar de los futuros enfermeros permitirá tener elementos para el diseño de estrategias que mejoren retención de los profesionales en Colombia.

Descriptores: emigración e inmigración; estudiantes de enfermería; facultades de enfermería; fuerza laboral en salud; condiciones de trabajo; Colombia.

Intenção, motivações e barreiras para emigrar de estudantes de enfermagem na Colômbia

Resumo

Objetivo Explorar a intenção, motivações e barreiras para emigrar de estudantes de enfermagem no último semestre da Colômbia. **Métodos.** Estudo quantitativo, descritivo e transversal com a participação de 556 estudantes finalistas matriculados em 26 cursos de graduação em Enfermagem na Colômbia. Os dados foram coletados por meio de questionário online. **Resultados.** 84% dos participantes consideram emigrar para exercer a profissão noutro país como parte dos seus planos enquanto futuros profissionais de enfermagem. Os destinos preferidos de quem já pensou em emigrar incluem países como Canadá (63.5%), Espanha (57.7%), Alemanha (44.9%) e Estados Unidos (44.4%). Os principais motivos que motivam os estudantes de enfermagem a emigrarem quando concluem os seus estudos profissionais são: melhor remuneração (81.6%), melhor qualidade de vida (67.9%), maior crescimento profissional (64.1%), maior estabilidade profissional (54.7%). mais opções de emprego (49.8%). Por sua vez, os motivos que desencorajam os estudantes de enfermagem de emigrar quando concluem os estudos profissionais são: a língua (71.9%), o afastamento da família (60.6%) e a complexidade do processo de emigração (55.4%). **Conclusão.** Os resultados desta investigação mostram que uma proporção significativa de estudantes de enfermagem no último semestre considera emigrar para exercer a profissão noutro país como parte dos seus planos quando obtiverem a licenciatura. O conhecimento das intenções, motivações e barreiras à emigração dos futuros enfermeiros fornecerá elementos para o desenho de estratégias que melhorem a retenção de profissionais na Colômbia.

Descritores: emigração e imigração; estudantes de enfermagem; escolas de enfermagem; mão de obra no sector da saúde; condições de trabalho; Colômbia.

Introduction

In a globalized environment, such as the current, and with differences that seem to be important for nurses in terms of remuneration, working conditions, and the social value of their profession, emigration ends up becoming a life alternative for many. For Colombia, the nursing practice is precarious, poorly recognized at social and institutional levels and, given its particularities, it is a quite emotionally and physically demanding profession.(1) It is likely that this is perceived by undergraduate nursing students and, in the face of possibilities of a better future, they consider the alternative of emigrating to practice in another country once they have their degree.

The World Health Organization has expressed concern because of the increased global deficit of health personnel and the imbalance between the offer, demand, and the needs of said personnel.[2] In the particular case of nursing, the number of foreign nurses that have been received in developed countries has increased by 60% since 2010. Migration is accompanied by a shortage of around 20.7-million nurses and midwives around the world,[3] a situation that increased with the Covid-19 pandemic. In a survey by the International Council of Nurses (ICN) in December 2020 of national associations of nurses, one of every five of them reported an increase in the number of professionals who abandoned the practice as consequence of the pandemic.[4] It has been suggested that poor working conditions of nurses in developing countries lead them to emigrate to more developed countries,[5] although migration to other countries can imply that the nurse who emigrates becomes exposed to situations of labor exploitation.[6] For the region of Latin America, the migratory phenomenon of nurses between 2006 and 2011 had as principal host countries Brazil, which received 35.1% of the migrants, Venezuela 22.6%, Chile 21.7%, and Argentina 14.6%, while the principal countries of origin of the migrants were Peru, which represented 95.1% of nurses emigrating from the region, followed by Paraguay with 2.6%.[7]

Immigrants bring human and financial capital to the host country and, at the same time, bring to their country of origin not only economic resources but also the knowledge, skills, and cultural elements learned from the host country. In addition, migration is recognized as strongly linked to the development of countries and regions.[8] However, for the countries of origin, it represents a loss of human capital that affects the health system not only due to the reduction of staff *per se*, but also because of the compromise on the quality of care, which increases inequality. Furthermore, if professionals cannot perform as such in the host country, it is required that upon re-entering the country of origin they be prepared to practice the profession there, with the economic and time costs that this implies.[9]

In the scientific literature available, few recent studies are found on the intention to emigrate in nursing. Some of them, conducted in Asian and European countries, explored the intention to emigrate by nurses and advanced-level nursing students and the reasons or factors to do so.[10-15] Nevertheless, no studies carried out in Colombia related to this phenomenon were identified, which is why the research question arose: what is the intention, motivations, and barriers to emigrate of last-semester students from undergraduate nursing programs in Colombia? According with the foregoing, the aim of this research was to explore the intention, motivations, and barriers to emigrate of last-semester students from undergraduate nursing programs in Colombia. It is expected for this study to contribute to understand a little-explored phenomenon that is decisive in the construction of human resource policies in nursing for Colombia.

Methods

Study design. This was a cross-sectional study with a quantitative approach and descriptive scope carried out between February and April 2024.

Population. Last-semester students registered in 26 undergraduate nursing programs from 23 university institutions in Colombia. The total of possible participating students registered in the last semesters in these 26 nursing programs was 819 students for the first academic period of 2024. All the possible students were invited to participate, obtaining a final sample of 556 participants, for a participation percentage of 67.8%, using non-probabilistic sampling.

Instrument. The study used a questionnaire elaborated by the researchers from the scientific literature available. The questionnaire had three sections: (i) sociodemographic questions, (ii) questions about the intention to emigrate, plans and preparation; and (iii) motivations and barriers to emigrate. Once the questionnaire was elaborated, a pilot test was carried out with participation from 17 last-semester undergraduate nursing students from two university institutions. During this test, each participant was asked about the clarity, ease of comprehension, and ease to answer each of the questions. With the data obtained, an acceptance index was calculated for each question, where values close to 1 indicated acceptance by the majority of the participants. Values were obtained between 0.94 and 1 in terms of clarity, between 0.82 and 1 in ease of comprehension, and between 0.88 and 1 in ease of response. From the results of the pilot test, the questionnaire was consolidated for its application.

Collection of information. The questionnaire was incorporated onto the secure Research Electronic Data Capture (REDCap) software platform to collect research study data and, through a hyperlink, it was disclosed to the academic units (Nursing faculties, departments, schools) from the university institutions that accepted to support the research and who directly forwarded the hyperlink to the students; or, in other cases, the hyperlink was allowed to be sent to the students directly by the research team via e-mail. Periodically, reminders were sent to the academic units to encourage student participation and completion of the questionnaire.

Data analysis. Data was extracted directly from the REDCap platform, then it was organized and incorporated onto the SPSS statistical software for analysis. The results were obtained from the use of descriptive statistics, particularly frequencies and percentages.

Ethical considerations. This research received approval 003-23 from the Research Ethics Committee of the Faculty of Nursing at Universidad Nacional de Colombia. In compliance with the ethical principles of research, informed consent for participation was included in the REDCap platform, where participants were informed of the objective of the research, the purpose of their participation, and the possibility of withdrawing at any time without any repercussions, along with

the appropriate treatment that would be given to the data by the research team with the relevant anonymity and confidentiality, for which reason, personal data that would allow identifying the participants was not included in the form. The consent had to be accepted by the participants prior to their filling out the form.

Results

The study obtained 675 completed forms, of which 3 (0.4%) were discarded due to not providing consent to participate, 101 (14.9%) due to incomplete information, and 15 (2.2%) because participants were not in the final enrollment of their undergraduate nursing program. Thus, the results of this research were generated from 556 forms completely filled out by students from the last academic semester of 23 undergraduate nursing programs in Colombia.

The principal demographic characteristics of the participants included mean age of 24.5 ± 4.2 years (minimum 20 years and maximum 40 years); the highest percentage were of female biological sex (82%); 98.9% had Colombian nationality by origin and, of those remaining, five were born in Venezuela and had Colombian nationality and one was born in Spain without having Colombian nationality. Regarding marital status, 84.9% of the participants were single, 9.9% were in a common-law relationship, 4.5% were married, 0.4% were divorced, and 0.4% were widowed. In addition, 15.8% of the students had children (1 = 11.7%, 2 = 3.8% and 3 = 0.4%). The study also found that 27.1% of the students knew other countries and 70.5% had relatives residing outside of Colombia.

The participants resided in 20 departments of the country, with Cundinamarca (16.1%), Valle del Cauca (15.8%), and Santander (12.4%) being the departments with the highest participation of students; 58% of the participants indicated being in the last enrollment of their professional nursing studies in a private university institution and the rest were from a public university institution.

To find out about the participants' communication skills in other languages, they were required to select from a list of languages that they read, wrote, and spoke, other than Spanish. Only 30.4% reported reading, speaking, and writing at least one language different from Spanish; with English being the most frequent in nine of every ten cases.

With respect to the intention to emigrate, the participants were asked if among their plans as future professionals they have considered emigrating to practice the profession in another country, to which 84% of the participants responded affirmatively (of these, 56.6% from private university institutions versus 43.4% from public university institutions).

The participants who have considered emigrating (n = 468) to practice their nursing profession in another country when they have their professional degree were asked to select from a list a maximum of three of their interest. Canada is the country most-often selected by the participants (n = 297), followed by Spain (n = 270), Germany (n = 210), the United States (n = 208), the United Kingdom (n = 70), Mexico (n = 56), Argentina (n = 44), Chile (n = 38), and Portugal (n = 14). Other destinations selected by the participants were: Italy (n = 18), Australia (n = 15), Brazil (n = 7), the Netherlands (n = 4), Sweden (n = 4), Austria (n = 3), Switzerland (n = 3), France (n = 3), Japan (n = 3), Poland (n = 2), Norway (n = 2), South Korea (n = 1), El Salvador (n = 1), New Zealand (n = 1), Israel (n = 1), Panama (n = 1), United Arab Emirates (n = 1), Belgium (n = 1),and Luxemburg (n = 1).

The 468 participants who expressed their intention to emigrate were also asked about the activities or requirements they have carried out or are carrying out in order to emigrate, with the most frequent being: searching for information

about employment and professional practice in the destination country (52.1%), taking courses to learn another language (49.4%), requesting information about requisites to arrive at the destination country (36.5%), contacting with people or companies that provide advice and accompany emigration (21.8%), preparing for general or profession-specific knowledge tests required by the destination country (11.8%), and contacting with possible employers (11.1%) (Table 1).

Table 1. Activities currently carried out to be able to emigrate (n = 468)

Activities		Frequency	Percentage
Search for information about employment and professional practice in the destination country.	Has not begun	224	47.9
	Is doing so	226	48.3
	Already completed it	18	3.8
Request for information about requisites to arrive at the destination country (visa, passport, homologation or recognition of degrees, work permit, etc.)	Has not begun	297	63.5
	Is doing so	156	33.3
	Already completed it	15	3.2
Contact with people or companies that provide advice and accompany emigration of nursing professionals	Has not begun	335	71.6
	Is doing so	97	20.7
	Already completed it	5	1.1
	Not considered necessary	31	6.6
Contact with possible employers	Has not begun	416	88.9
	Is doing so	48	10.3
	Already completed it	4	0.9
Request for information of documents (certificates or evidence) in the university where they study to initiate homologation procedures abroad.	Has not begun	416	88.9
	Is doing so	47	10.0
	Already completed it	5	1.1
Language learning course.	Has not begun	186	39.7
	Is doing so	193	41.2
	Already completed it	38	8.1
	Does not apply	51	10.9
Preparation for knowledge tests (general or profession-specific) required by the destination country.	Has not begun	395	84.4
	Is doing so	50	10.7
	Already completed it	5	1.1
	No proficiency tests are required	18	3.8

With regards to the motivations to emigrate of the participants who have considered practicing the nursing profession in another country when they get their degree (n = 468), the main reasons can be observed in Table 2, thus: better remuneration (81.6%), better quality of life for me (67.9%), greater professional growth (64.1%), more job stability (54.7%), and more employment options (49.8%).

Table 2. Reasons that motivate emigrating to practice the profession in other countries (n = 468)

Reason	Frequency	Percentage
Better remuneration	382	81.6
Better quality of life for me	318	67.9
Greater professional growth	300	64.1
More job stability	256	54.7
More employment options	233	49.8
Being able to provide better education and/or quality of life for the family	184	39.3
Better professional recognition	162	34.6
Greater professional satisfaction	154	32.9
Knowing a different culture	146	31.2
Possibility of studying at graduate level	144	30.8
Knowing the professional practice in another country	92	19.7
More personal security (less violence, for example)	89	19
Better work environment	83	17.7
Having new links	69	14.7
Reuniting with relatives	28	6
Accompanying a relative who has job security in that country	14	3

Finally, all the participants (n = 556) were asked about the principal reasons that can discourage or limit the intention of emigrating to other countries to practice the nursing profession. According with Table 3, the principals reasons reported include language (71.9%), going away from the family (60.8%), and the complexity of the emigration process (55.4%). It was also possible to identify among the other reasons the lack of financial resources to carry out the process and procedures required to emigrate (2%).

Table 3. Reasons that discourage emigrating to practice the profession in other countries (n = 556)

Reasons	Frequency	Percentage
Language	400	71.9
Going away from the family	338	60.8
The complexity of the emigration process	308	55.4
Differences in the professional practice among countries	191	34.4
The possibility of finding good employment in Colombia	162	29.1
Difference in culture	149	26.8
Differences in health technology among countries	98	17.6
Going away from Friends	93	16.7
Lack of skill and competence to perform as a nurse	82	14.7
Other reasons	11	2

Discussion

The results herein permitted recognizing that emigrating is an attractive option for students who are about to finish their university undergraduate nursing studies in Colombia. For recent graduates and professionals alike, facing the reality of professional practice can differ from their expectations as students and from their role as such,[16] being an expected reason to consider the option of emigrating. However, this study found that, even without having faced professional life in Colombia, last-semester students set their expectations on the professional practice abroad and, in addition, have plans to do so.

The high percentage of respondents motivated to emigrate, > 80%, exceeds that found in Mexico, where the intention to emigrate to work by students was 65%.[17] Studies conducted in other countries, like Nepal, Serbia, Ghana, Indonesia, and Ireland have also evidenced the intention to emigrate of nursing students.[18] According to health statistics for 2021 by the Organization for Economic Cooperation and Development (OECD), which compared the number of nurses per one-thousand inhabitants between 2011 and 2021, it was found that, among the countries evaluated, the third country with the lowest number of nurses is Colombia with (1.6 x 1000 inhabitants).[19] Thus, the greatest implication of this interest would undoubtedly lie in that, if the emigration of these future nursing professionals were to materialize, their increased deficit in Colombia would result in a threat to the Colombian health system and in a public health problem of enormous magnitude. Moreover, the deficit of nursing professionals could motivate health institutions to seek strategies to meet the needs of professional services with nursing aides, affecting the quality and security of nursing care provided to the Colombian population.

The destination countries selected to emigrate in this study show how the spectrum of these destinations broadens from countries in America

to Europe, Asia, and Oceania. Germany, selected by almost half of the respondents, is a country that has made cooperation efforts to bridge the significant shortage of nurses in their country with Colombian nurses and, in this task, it is accompanied by some university institutions and private companies that prepare their students for such. Canada, Spain, Germany, and the United States lead the group of countries to emigrate to among the respondents; three of them have also been sought after by Mexican students,[17] with the United States and Canada being two of the four destinations of greater interest for Asian students, together with Australia and the United Kingdom.[11,13] Interest also exists in emigrating to Latin American countries, like Mexico, Argentina, and Chile, which have one less requirement to access them: that of language. Interest in these destinations reveals how migratory movements are established in Latin America from "south to south", that is, between the countries of the region, and not "south to north" as is usually expected, from developing countries to developed countries.[20]

According to the density of nurses in practice for every one-thousand inhabitants published by the OECD[19] and the students' destinations of preference in this study, it is possible to indicate that, if their emigration is carried out in the future, Colombia would be "exporting" nursing professionals to countries, like Germany and the United States that have 10.4 more nurses for every 1000 inhabitants than Colombia; Canada with 8.7 more nurses for every 1000 inhabitants than Colombia; and Spain with 4.7 more nurses per 1000 inhabitants than Colombia. This would increase the shortage of nurses in Colombia to an unsustainable point for the health system, which would consequently increase inequality in access to nursing care in the country.-

Special attention should be paid to the emigration intention of students who are currently being trained in programs whose funding source is public resources from the State to supply the deficiencies and needs of human talent specific to the country. If their emigration were to materialize, State investment would be used to meet the human talent needs of other countries. Several of the respondents who are interested in emigrating are making concrete plans to do so or have already completed them, especially in relation to finding information about the destination country, contacting companies looking to hire nurses, and – very specially – preparing themselves in the language required by the destination country, a task being carried out or already completed by half of them.

Regarding plans to emigrate, the work of recruiting companies to find nurses is of particular concern, given experiences of nurses who have emigrated through these companies and who ended up being exploited in what has been called "co-ethnic exploitation" when it is compatriots who exploit nurses from the beginning of recruitment to labor exploitation in the destination country.[21] Of course, with or without intermediaries, emigrating entails risks of discrimination, as has been documented from studies carried out in Australia and the United Kingdom,[22,23] although these studies do not include Latin American nurses.

Among the motivations to emigrate, remuneration is the most frequent, being the factor that has been recognized as central to emigrate in other studies.[10,15,24,25] According to a report on the health labor market in Colombia, with data from 2022, a nursing professional earns monthly $2 325 344 Colombian pesos (Approx. $607USD – Exchange Rate 17/05/2024) for working an average of 48 hours per week, at a rate of cop $47 748 per hour.[26] Although the income of Colombian nurses is above the national average, it does not seem to be compatible with the responsibilities, physical effort, mental exhaustion of the nursing professionals, nor with the hours of work required to carry out their work.

Professional growth is another aspect considered relevant for the respondents, as

found in a multicenter study conducted with Italian nurses.[12] The interest of young nursing students in achieving a better quality of life is striking, given that this has been recognized as a motivating force to emigrate,[10,24,27] which is related with the equilibrium of life at work and life outside of work. The respondents in this study possibly perceive instability in the employment of nursing professionals in Colombia, which coincides with the results presented by the Labor Observatory at Universidad del Rosario from an analysis of the Large Integrated Household Survey that found that 38.7% of nursing professionals do not have indefinite labor contracts.[26] With respect to the barriers to emigrate, the principal discouraging factor was language, which is consistent with the activities being undertaken currently to emigrate, where most of the participants are taking a course to learn another language. Among the other factors, the reference to the complexity of the emigration process is striking, reported by more than half of the respondents. Added to this is the fact that some students were explicit in pointing out economic reasons as another barrier when considering this option, as documented in the literature on the subject.[28]

Conclusion. Emigrating is an option of interest for 84% of the participants who are close to completing undergraduate university nursing studies in Colombia. These results show government entities, like the ministries of health and labor, the need to implement measures aimed at controlling the control the so-called brain drain that could be occurring in nursing. The fact that students express intention to emigrate suggests that government entities, nursing professional associations and unions should urgently work on retaining the new generations of professionals to prevent the migration phenomenon from worsening the shortage of nurses in the country, leading to a public health crisis.

It will not be enough to train more nursing professionals if, from those responsible for human talent in health and nursing leaders, there is no work on aspects related to remuneration, job stability, and quality of life of nurses because, eventually, the country would end up training an appreciable number of professionals who will end up practicing the profession outside of Colombia. Due to the aforementioned, it is essential that, in the country's political agenda, the government establish measures and strategies to regulate the emigration and immigration of human talent in health, including nursing professionals who opt for this life alternative and professional practice. It is considered pertinent and necessary to continue researching this phenomenon, replicating these types of studies in Latin America to identify the emigration intention of current and future nursing professionals and, thus, design strategies and key interventions to improve professional retention in the country.

The principal limitation of this study is the impossibility of generalizing the results to the entire population of last academic semester undergraduate nursing students in Colombia. Nevertheless, the strategies used to achieve participation permitted having an important number of students.

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Attitudes of nursing students towards ageism and associated factors

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Attitudes of nursing students towards ageism and associated factors

Abstract

Objective. To evaluate the associated factors on ageism in nursing students from a public university in Recife-PE. **Methods.** This is a cross-sectional, quantitative, analytical study, whose participants (n=215) were students of the bachelor's degree in Nursing at a public university in Recife, Pernambuco, Brazil. Data regarding responses to a sociodemographic questionnaire and Fraboni Ageism Scale were analyzed. **Results.** The characteristics that predominated among the participants were: female (83.3%), age between 17-20 years (41.9%), single (92.1%), did not have a scholarship (83.5%), lived with parents and/or siblings (60.9%), had no child (98.1%), did not live with the older adult (74.4%), and was attending the first year of under graduation (28.4%). On the Fraboni Scale, the score was 36.74 out of 84 possible points for ageism, being by domain: 11.55 points for Avoidance, 11.54 points for Antilocution, and 10.05 points for

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Discrimination**.** **Conclusion.** Among the nursing students surveyed, ageism was associated with the male gender, younger age, not being a scholarship holder and living alone. Education and training aimed at caring for the older adults are effective tools to challenge prejudice related to aging.

Descriptors: older adults; ageism; attitudes; aging; nursing students.

Actitudes de los estudiantes de enfermería hacia el edadismo y factores asociados

Resumen

Objetivo. Evaluar los factores asociados al edadismo entre los estudiantes de enfermería de una universidad pública de Recife-PE. **Métodos.** Se trata de un estudio transversal, cuantitativo, analítico, cuyos participantes (n=215) eran estudiantes del curso de Licenciatura en Enfermería de una universidad pública de Recife, Pernambuco, Brasil. Se analizaron datos de un cuestionario sociodemográfico y de la Escala de Edad de Fraboni. **Resultados.** Las características que prevalecieron entre los estudiantes fueron: sexo femenino (83.3%), tener entre 17 y 20 años (41.9%), ser soltero (92.1%), no tener beca de estudios (83.5%), vivir con los padres y/o hermanos (60.9%), no tener hijos (98.1%), no vivir con personas mayores (74.4%) y cursar el primer año de licenciatura (28.4%). En la Escala de Fraboni, la puntuación fue de 36,74 puntos sobre 84 posibles para el edadismo, y por dominios: 11.55 puntos para la Evitación, 11.54 puntos para la Antilocución y 10.05 puntos para la Discriminación. **Conclusión.** Entre los estudiantes de enfermería encuestados, el edadismo se asoció al género masculino, a la menor edad, a no estar becado y a vivir solo. La educación y la formación orientadas al

cuidado de las personas mayores son herramientas eficaces para hacer frente a los prejuicios relacionados con la edad

Descriptores: ancianos; edadismo; actitudes; envejecimiento; estudiantes de enfermería.

Atitudes de estudantes de enfermagem diante do ageísmo e fatores associados

Resumo

Objetivo. Avaliar os fatores associados sobre o ageísmo nos estudantes de enfermagem de uma universidade pública do Recife-PE. **Métodos.** Trata-se de um estudo transversal, quantitativo, analítico, cujos participantes (n=215) foram discentes do curso de bacharelado em Enfermagem de uma universidade pública de Recife, Pernambuco, Brasil. Foram analisados dados referentes a respostas de um questionário sociodemográfico e Escala de Fraboni de Ageísmo. **Resultados.** As características que predominaram entre os participantes foram: sexo feminino (83.3%), idade entre 17-20 anos (41.9%), solteiro (92.1%), não possuía bolsa estudantil (83.5%), morava com pais e/ou irmãos (60.9%), não tinha filho (98.1%), não convivia com idoso (74.4%), e estava cursando o primeiro ano de graduação (28.4%). Na Escala de Fraboni, a pontuação foi de 36,74 de 84 pontos possíveis para o ageísmo, sendo por domínio: 11.55 pontos para o Evitamento, 11.54 pontos para Antilocução, e 10.05 pontos para Discriminação. **Conclusão.** Entre os estudantes de enfermagem pesquisados, o ageísmo foi associado ao gênero masculino, à idade mais jovem, ao fato de não ser bolsista e de morar sozinho. A educação e o treinamento voltado ao cuidado em idosos são ferramentas eficazes para desafiar o preconceito relacionado ao envelhecimento.

Descritores: idoso; idadismo; atitudes; envelhecimento; estudantes de enfermagem.

Introduction

Population aging is a global reality that has been intensifying in recent years. It is a natural and lifelong process that, although universal, is not uniform. There are morphological, functional, biochemical, physical and mental changes in it, which occur in a different way and speed for both sexes.[1] This phenomenon is shaped by the relationships one has with the social and physical environments in which the person lives throughout life, varying according to some characteristics, such as personal, family, sex and ethnic characteristics.[2] According to the United Nations, the number of old adults aged 60 and over was 202 million in 1950, increased to 1.1 billion in 2020, and is expected to reach 3.1 billion by 2100.[3] In Brazil, population aging was highlighted by the total number of people aged 60 or over in the country in the last census of 2022, pointing out 32,113,490 older people, corresponding to 15.6% of the population.[4] With the advent of the phenomenon of population aging, ageism, a term that emerged with Robert Buttler[5] to refer to discrimination against individuals based on their age, which can cause harm, disadvantages and injustices and erode solidarity between different generations, has become more common, even if not explicit.[6]

Ageism can manifest itself at the individual, institutional, social or political level, encompassing the different social units, person, family, community and society, through prejudices and erroneous stereotypes, producing discriminatory attitudes and behaviors towards the older person.[7] With the increase in life expectancy, older people and very older people have been nursing clients. Identifying and understanding the ageism present among health professionals is pertinent, since age prejudice causes them to attribute the physiological complications experienced by the older adult to "unfortunate consequences of aging", thus leading to inadequate care, with tendencies to offer or provide inadequate care and treatment to the older adult compared to the younger ones.[8,9]

Care for the older adults can be inhibited by ageism among health professionals, including acts and behaviors, such as speaking low to the older adults and/or providing unequal care to the older adults compared to the younger ones, in addition to minimizing interest in the area of aging: studies show that nursing students have a decreased desire to work in the area of gerontology.[10] In addition, nursing students expressed age behaviors, such as talking slower or louder with the older adults, and cementing characteristics of how an older person should be and act.[11] A study conducted in Jordan with 290 nursing students, the data indicate that most of them reported insufficient knowledge and had discriminatory attitudes and behaviors related to age. In addition, a significant difference was found between the students of the latter year and the former in relation to knowledge about aging.[12]

Strategies to reduce ageism include international laws and public policies such as the Madrid Political Declaration and International Plan of Action on Ageing, the European Union Directive on equal treatment in employment, the Protocol on the Rights of Older Persons in Africa and the Inter-American Convention on the Protection of the Human Rights of Older Persons.[6] In addition, studies indicate that educational interventions are among the most efficient strategies for reducing ageism.[10-13] An educational intervention was conducted in Mazandaran province (Iran) with primary, secondary, high school and university students. The intervention consisted of ten workshops addressing issues about human aging, and included lectures, films, brochures, discussions, and conversations with older people. Before the intervention, it was found that primary, secondary and high school students were less ageist in relation to university students, according to the Fraboni Ageism Scale (FSA). The intervention lowered ageism scores in all groups of students. The study also found that ageism was more prevalent among nursing and medical students when compared to students in other courses.[13] Providing education and training to nursing students in order to know and reduce age-related prejudice is important in the process of care and biopsychosocial well-being of the older adults, which in the future will have an impact on the nursing care of the older adults. Thus, the objective of this study was to evaluate the factors associated with ageism in nursing students at a public university in Recife-PE.

Methods

This is a quantitative cross-sectional study that is part of a multicenter study entitled "Attitudes and perceptions in nursing students: Brazil and Peru" carried out at the Nursing College Nossa Senhora das Graças of University of Pernambuco – FENSG/UPE, with headquarters and jurisdiction in the city of Recife-PE-Brazil. FENSG is a 77-year-old higher education institution that trains bachelors in Nursing, masters and PhD in Nursing. The nursing course is expected to last five years (10 terms), with 60 vacancies per entry in each semester.

The sample size was estimated considering the number of 476 students enrolled in the academic semester of 2022.2, with a sampling error of 5% and a confidence level of 95%, indicating the need to collect at least 149 students. However, the selection of students was for convenience, where all had the same condition to participate as long as they completed the instrument within the stipulated deadline, and the risk of bias was not controlled, since all eligible students were invited to participate in the study. All 215 students who started completing the instrument completed it.

To participate in the study, students had to meet the following inclusion criteria: be regularly enrolled in the nursing course in the 2022-2 semester. Students who were absent from the course due to withdrawal and/or illness were excluded from the research. The instruments used were the sociodemographic profile (age, sex, marital status, and year of study, paid work, student and family income, people with whom they live; lives with the older adult) and the Fraboni Ageism Scale was used to assess ageism. It evaluates explicit ageism through cognitive and affective aspects of prejudice from three levels (domains): antilocution, avoidance and discrimination.[14] The Scale, validated for Brazilian Portuguese, presented a Cronbach's Alpha of $\alpha = 0.88$ divided into three factors: separation (10 items, $\alpha = 0.85$); stereotype (5 items, $\alpha = 0.78$); and affective attitudes (6 items, $\alpha = 0.68$). The scale consists of 21 questions, and the response scale is a four-point Likert type with response categories: 1=strongly disagree, 2=disagree, 3=agree and 4= strongly agree.[15] The higher the scores, the greater the person's ageism. Each domain has seven items. It is important to note that questions B16 to B21 require differentiated attention in relation to the others, since the results in the Agree or Disagree indexes reflect the opposite, as they denote positive attitudes towards aging.

Thus, their scores are inverted, so that they result in scores compatible with the others.

Data collection was carried out online through the Web-based Survey and made available to students via institutional e-mail and later, for greater adherence through the social network WhatsApp between January and May 2023. Upon accessing the research link, students were directed to the Informed Consent Form (ICF), where they could read and accept or not participate in the study. Acceptance or not to participate in the study was automatically recorded in the database.

The data obtained through the instruments were stored in a database in the Google Drive tool, which was exported to the *SPSS* software, where the analysis was performed.

To characterize the personal and clinical profile, habits and experience of abuse of the patients evaluated, the percentage frequencies were calculated and the respective frequency distributions were constructed. The Fraboni ageism scale measures were calculated in order to determine the domains with the highest level of ageism. To compare the mean of the total ageism score, avoidance score, discrimination score, antilocution score, and the ageism score in the organizational context, between the profiles of the students evaluated, the means and standard deviation of the scores were calculated. Each domain and total score of the Fraboni scale was analyzed using Pearson's correlation and Student's t-test. Multiple linear regression was used to identify the association between the domains and the total of the scale with the participants' sociodemographic variables. All statistical tests were considered significant when the p-value was equal to or less than 0.05.

The research was, in the form of a subproject, approved by the Research Ethics Committee under registration – CAAE 53589221.9.2001.5192 and opinion number 5,428,778.

Results

Of the population of 476 nursing students eligible for the research, there were 215 participants. There was no record of dropouts. Most students were female (83.3%), aged 17 to 20 years (41.9%), and single (92.1%), without a scholarship (83.5%), lived with their parents and siblings (60.9%), had no child (98.1%), did not live with the older adult (74.4%) and were attending the first year of under graduation (28.4%). Of the students who had some contact with the older adult, this was the grandfather or grandmother (87.3%). The correlation between the domains of the Fraboni scale and the total of the scale, and a correlation was identified between the antilocution domain and the year of under graduation of the participant (p=0.036).

Table 1 shows that the Avoidance domain was related to sex (p=0.018, higher in men), scholarship holder (p=0.042) and living with the older adult (p=0.005). The discrimination domain was also related to sex (p=0.050, higher in men), scholarship holders (p=0.011) and those who live with the older adult (p=0.032). In the same table, in the antilocution domain there was a relationship with sex (p=0.015, higher in men) and scholarship holder (p=0.046). Finally, in the comparison of means of the total scale, called ageism, there was a relationship with sex (p=0.023, higher in men), scholarship holder (p=0.015) and living with the older adult (p=0.019).

Table 1. Comparison of means between the domains and total of the Fraboni scale with the sociodemographic variables of the nursing student, Recife-PE, 2023

Domain	Variable	Category	*n*	Mean	SD	95% CI		*p*-value
Avoidance	Sex	Female	179	11.15	3.29	10.68	11.64	0.018
		Male	36	13.56	5.00	12.02	15.24	
	Marital status	Single	198	11.52	3.66	11.02	12.04	
		Married	14	12.00	4.72	10.17	15.27	0.922
		Divorced	3	12.00	4.36	6.51	15.10	
	Scholarship holder	No	180	11.77	3.72	11.24	12.33	0.042
		Yes	35	10.46	3.63	9.40	11.80	
	Lives with the older adult	No	160	11.23	3.92	10.65	11.87	0.005
		Yes	55	12.49	2.94	11.72	13.26	
Discrimination	Sex	Female	179	9.74	2.94	9.33	10.18	0.050
		Male	36	11.58	4.41	10.25	13.10	
	Marital status	Married	14	10.86	4.02	9.06	13.17	
		Divorced	3	11.33	5.03	6.17	15.55	0.693
		Single	198	9.97	3.22	9.54	10.44	
	Scholarship holder	No	180	10.29	3.31	9.83	10.80	0.011
		Yes	35	8.80	2.93	7.92	9.84	
	Lives with the older adult	No	160	9.86	3.49	9.35	10.44	0.032
		Yes	55	10.58	2.57	9.92	11.26	
Antilocution	Sex	Female	179	11.26	3.40	10.77	11.76	0.015
		Male	36	12.94	4.45	11.50	14.36	
	Marital status	Married	14	11.93	4.12	9.93	14.09	
		Divorced	3	10.67	3.22	6.69	12.98	0.854
		Single	198	11.53	3.62	11.03	12.04	
	Scholarship holder	No	180	11.77	3.54	11.27	12.30	0.046
		Yes	35	10.34	3.93	9.12	11.69	
	Lives with the older adult	No	160	11.35	3.78	10.78	11.95	0.101
		Yes	55	12.09	3.15	11.25	12.90	
Ageism	Sex	Female	179	35.65	9.48	34.29	37.06	0.023
		Male	36	42.11	14.64	37.51	46.94	
	Marital Status	Married	14	38.86	13.03	33.14	46.51	
		Divorced	3	37.67	13.80	20.82	47.70	0.845
		Single	198	36.57	10.59	35.14	38.08	
	Scholarship holder	No	180	37.50	10.59	36.00	39.09	0.015
		Yes	35	32.80	10.85	29.48	36.59	
	Lives with the older adult	No	160	35.93	11.32	34.26	37.76	0.019
		Yes	55	39.07	8.55	36.70	41.19	

SD = Standard Deviation; 95% CI = 95% confidence interval; p-value = statistical significance

The Hierarchical Linear Regression model was used to test predictors against domains and ageism. Table 2 shows that the Avoidance domain was associated with male gender ($p<0.001$), age ($p=0.011$) and not being a scholarship holder ($p=0.036$). On the other hand, in the Discrimination domain, it was associated with male gender (p=0.002), age ($p=0.017$), being single ($p=0.036$), not being a scholarship holder ($p=0.017$), and living alone ($p=0.036$).

The antilocution domain was associated with age ($p=0.008$), study time ($p=0.003$), not being a scholarship holder ($p=0.048$) and living alone ($p=0.005$). In the Fraboni Scale total model, called ageism, an association was identified with male gender ($p=0.002$), age ($p=0.007$), not being a scholarship holder ($p=0.018$) and living alone ($p=0.012$).

Tabela 2. Association between the domains of the Fraboni scale with the sociodemographic variables of nursing students. Recife-PE. 2023

Domain / variables	B	CI 95% (min/max)	*p*-value
Avoidance			
Gender			
Female	-		
Male	2.869	1.288, 4.449	<0.001
Age	-0.298	-0.526, -0.070	0.011
Scholarship holder			
No	-		
Yes	-1.589	-3.074, -0.104	0.036
Discrimination			
Gender			
Female	-		
Male	2.218	0.812, 3.624	0.002
Age	-0.248	-0.451, -0.045	0.017
Marital status			
Married	-		
Divorced	-2.309	-9.136, 4.517	0.505
Single	-5.275	-10.207, -0.342	0.036
Scholarship holder			
No	-		
Yes	-1.615	-2.936, -0.294	0.017
Lives with the older adult			
With my parents and siblings	-		
Family and grandparents	1.052	-2.144, 4.249	0.516
Alone	1.926	0.125, 3.728	0.036
Only with grandparents	-0.830	-3.955, 2.295	0.601
Husband/Wife	-3.351	-8.703, 2.000	0.218
With friends /student house	-2.245	-4.978, 0.488	0.107

Tabela 2. Association between the domains of the Fraboni scale with the sociodemographic variables of nursing students. Recife-PE. 2023 (Cont.)

Domain / variables	B	CI 95% (min/max)	*p*-value
Antilocution			
Age	-0.294	-0.508, -0.079	0.008
Study time	0.295	0.104, 0.487	0.003
Scholarship holder			
No	-		
Yes	-1.410	-2.805, -0.015	0.048
Lives with the older adult			
With my parents and siblings	-		
Family and grandparents	0.910	-2.466, 4.285	0.595
Alone	2.713	0.811, 4.615	0.005
Only with grandparents	0.372	-2.928, 3.671	0.824
Husband/Wife	-2.094	-7.746, 3.557	0.465
With friends /student house	-2.729	-5.614, 0.157	0.064
Ageism			
Gender			
Female	-		
Male	7.218	2.707, 11.729	0.002
Age	-0.909	-1.560, -0.257	0.007
Scholarship holder			
No	-		
Yes	-5.119	-9.357, -0.881	0.018
Lives with the older adult			
With my parents and siblings	-		
Family and grandparents	3.738	-6.518, 13.994	0.473
Alone	7.403	1.623, 13.183	0.012
Only with grandparents	0.345	-9.681, 10.371	0.946
Husband/Wife	-3.714	-20.885, 13.456	0.670
With friends /student house	-7.230	-15.998, 1.538	0.105

Discussion

In this research, the factors associated with ageism in nursing students were younger age, male gender, less course time, not living with the older adult, lower income and not receiving an academic scholarship. The sociodemographic data of the sample reveal an unequal distribution regarding sex, proportional to the national rate, in which according to the 2022 University Education Census, 57.7% of students enrolled in university education were women.[16] The UPE Nursing course has a higher number of female students enrolled than the national mean (83.6%), also consistent with the distribution of the population by sex, both at the municipal, state and national levels, in which the female sex always prevails.[17] This unequal proportion

is related to the historical female predominance of the profession, despite the gradual increase in males pointed out in the literature.[18]

With regard to the age group of this study, the course is formed by young students aged 17 to 20, mostly single and without children. These results reflect the entry of these increasingly younger students into university education, as a consequence of factors such as the demands of the current economic market, improvements in access to university education, but also possible family and social demands to start under graduation immediately after high school. In addition, the marital status and number of children of most students in this study coincides with studies carried out in São Paulo and Rio de Janeiro, which justify this variable to probable influences of the course curriculum because it requires full dedication, and irregularity of the distribution of internships between the morning, afternoon and evening shifts, making family commitments difficult, and remaining in the labor market to obtain gains for family income.[19] It is also observed that most participants did not receive financial support grants offered by the university. The literature points out that not receiving a scholarship can have repercussions on the dropout of many students throughout their academic lives, both because the student seeks extra income and does not get due to the dedication that the course requires, as well as the lack of financial supply to meet the demands required by the course itself, such as clothing, books and instruments.[20] Allied to this is the fact that many students come from cities far from the capital or even from other states, with those responsible for the student bearing costs such as lodging, food and transportation.

In the analysis of the present study, it was found that there is a significant negative relationship between age prejudice scores and chronological age, where younger respondents tend to be more prejudiced in relation to those with more years. Such an association was already expected, since as people get older, they tend to become more critical of ageist attitudes.[21] With regard to gender, the study points to a greater association between males and ageism. Also, a study carried out among nursing students and nursing professionals trained in Sweden and Greece showed that males and young age (less than 25 years) are important risk factors for the prediction of ageism in relation to the older adults, and that this difference in attitudes between men and women is possibly explained by the greater degree of empathy of women.[22]

Considering the correlation of course time (year of under graduation) and ageism, it was found that the shorter the time of under graduation course, the greater the ageism. In fact, the literature elucidates that exposure to geriatric/gerontological content in health courses improves the perception of attitudes towards the older adults [23] However, in the nursing course, knowledge about these subjects, and curricular internship practices aimed at the older adults, occur mainly from the 7th semester of the course, which may explain this correlation of ageism and year of under graduation. A study that included 57 countries and estimated the global prevalence of ageism in the older adults and explored the possible explanatory factors revealed that the effect of schooling was more pronounced in relation to ageism than younger age or males.[24] However, among the participants of this study, the correlation between sex-ageism and age-ageism was higher than between the latter variable and ageism.

Study participants who live with an older person demonstrated less ageist attitudes than those who do not. Studies reveal that good quality contact is generally the most reliable predictor of prejudice reduction than simple one-off contact. Thus, the simple sporadic connection with older adults may not be enough to minimize generational prejudice.[25] A systematic review revealed that better quality contact, both with older adults in general and especially with grandparents and other older family members, reduces ageism.[26] Another study

conducted in 25 European Union countries found that people who reported having intergenerational friendships tended to be less ageist, applying to both younger and older adults,[27] which reinforces the idea that the undergraduate nursing course should include opportunities for interaction with the older adult, especially among those who do not have quality intergenerational interactions.

Discussing the findings of this study on income and receipt or non-receipt of university scholarships correlated with ageism is challenging, since there are few studies that analyze the correlation of these variables. In general, it was evidenced that people who live with lower income and without academic scholarship tend to be more ageists. The analysis by Officer, et al.[24] based on data from 57 countries found that 39% of survey participants in low- and lower-middle-income countries had highly ageist attitudes. To find that low income and ageism are associated is alarming, since about half of the world's population (48.3%) lives in low- and lower-middle-income countries (9.3% in low-income countries and 39% in lower-middle-income countries) [28]. On the other hand, according to the study by Officer, et al.[24], lower prevalence rates were present in higher income countries, such as Australia, Poland and Japan, where 69% of participants from high-income countries had lower rates of ageist attitudes when compared to 18% of participants in low- and lower-middle-income countries.

The literature points out that professionals with ageist attitudes tend to label older people as inflexible, unproductive, lonely, sick, senile, depressive, fragile and without energy.[29] In addition, while the presence of ageism interferes with the way the health professional understands the aging process, he can attribute symptoms such as sadness and pain to age, making it difficult to recognize pathological needs and processes in older adults.[30] Gould, Dupuis-Blanchard, and MacLennan[31] conducted a qualitative study to explore attitudes toward the older adults among Canadian nursing students, where 20 students participated in the study. It was revealed that, even though students had positive reactions when caring for older patients, they saw gerontological nursing as a non-prestigious and non-valued area. The researchers concluded that additional nursing education about caring for patients in the context of aging was needed.

Within the context of ageism among university students, the literature is congruent in stating that the contact and interaction of the student with the older adult in the different contexts of under graduation is considered essential for the development of positive attitudes and skills for the care of these people.[6] Nursing students participating in the study by Gould et al.[31], when asked whether attitudes towards older adults have changed since the beginning of the course, considered that contact interventions with older patients was the key to the development of positive attitudes towards the older population in general.

Educational interventions aimed at teaching about aging allow us to provide accurate information and examples that combat ageist stereotypes, dispelling misconceptions about this age group, teaching skills and knowledge, and allowing people to consciously reconsider and update their beliefs, feelings and behaviors, thus reducing ageism in the university environment. [30] These interventions include, for example, role-plays, simulations, lectures, virtual reality, intergenerational contact, student internships and mentoring, both focused on the aging process, and which may be integrated into the curriculum of university education courses. Such educational interventions are effective in reducing ageism and the price seems to be affordable.[6]

Study limitations. As this is a study in which only one course from a university was analyzed, the results do not necessarily reflect the reality of all nursing courses and students in Brazil and the world. It is also important to note that, as the statistical analysis worked with convenience

of samples, the restrictions on the generalization of these results are reinforced. The evidence obtained in this research can be extrapolated and explored in other contexts, in other courses or universities. In addition, the collection period took place during remote activities at the university due to the COVID-19 pandemic. There is evidence in the literature that the aforementioned disease has amplified harmful attitudes towards stereotypes, prejudices and discrimination based on age.[6] Thus, there is a possibility of a negative bias in the scores of the variables of interest.

Conclusion. From the research conducted, it can be seen that the ageism in the negative perspective of the FSA was more often associated with the male sex, not being a scholarship holder, not living with the older adult, not having children, and the initial semesters of under graduation; while the positive items of the FSA were more often associated with age and being a scholarship holder. Education and training aimed at caring for the older adults are effective and important tools to challenge prejudice related to aging. As a strategy for university education, nursing study programs should be integrated with a realistic and stimulating view of older adult care, providing the training of qualified nursing professionals with attitudes, knowledge and skills based on scientific evidence, offering gerontological care for a society that is increasingly aging.

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Original Article

Effect of a Specialized Nursing Subject Assignment on Perceived Knowledge and Skills to Care for Drug Users

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Effect of a Specialized Nursing Subject Assignment on Perceived Knowledge and Skills to Care for Drug Users

Abstract

Objective. To identify the effect of a specialized subject on addictions on the knowledge and skills perceived by undergraduate nursing students to care for drug users. **Methods.** This was a pre-experimental study of a single group with post- and pre-test measurements. The study included a sample of 59 students registered in the seventh semester in a public university in northeastern Mexico, who received 64 theoretical hours of the subject assignment "Nursing and addictions", which was taught in face-to-face classes by professor nurses with training in the care of addictions. The emphasis was theoretical, where strategies, like clinical cases, screening instruments, and audiovisual material were used. Information was collected about sociodemographic data and the scale by Happel et al., of knowledge and perceived skills on the care of alcohol and other drug users was applied. **Results.** The

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post-test registered higher scores in the subscales of overall knowledge on substance use ($W = -4.532$, $p < 0.001$), perceived knowledge on management of drug users ($W = -5.909$, $p < 0.001$), and perceived competences to care for alcohol and drug users ($t = -8.000$, $p < 0.001$). **Conclusion.** The subject assignment analyzed contributed to increasing knowledge by nursing students regarding the phenomenon of addictions. As for perceived competences, although these increased significantly, they would have to be demonstrated in light of practical scenarios that confirm their persistence and impact on the quality of care.

Descriptors: nursing education research; substance-related disorders; knowledge; perception

Efecto de una asignatura de enfermería sobre conocimientos y competencias percibidas para el cuidado de usuarios de drogas

Resumen

Identificar el efecto de una asignatura sobre adicciones en los conocimientos y competencias percibidas por estudiantes de Licenciatura en Enfermería para el cuidado de usuarios de drogas. **Métodos.** Estudio pre-experimental de un grupo único con mediciones *pre-test* y *post-test*. Se trabajó con una muestra de 59 alumnos matriculados en séptimo semestre de una universidad pública del noreste de México, quienes recibieron 64 horas teóricas de la asignatura "Enfermería ante las adicciones", la cual fue impartida en clases presenciales por enfermeros docentes con formación en el cuidado de las adicciones. El énfasis fue teórico, donde se recurrió a estrategias como casos clínicos, instrumentos de tamizaje y material audiovisual. Se recolectó información sobre datos sociodemográficos y se aplicó la escala de conocimientos y competencias percibidas sobre el cuidado de usuarios de alcohol y otras drogas de Happel *et al*. **Resultados.** En el *post-test* se registraron mayores puntuaciones en las subescalas de conocimientos generales sobre el uso de sustancias ($W = -4.532$, $p < 0.001$), conocimientos percibidos sobre el manejo de usuarios de drogas ($W = -5.909$, $p < 0.001$) y de competencias percibidas para cuidar usuarios de alcohol y drogas ($t = -8.000$, $p < 0.001$). **Conclusión.** La asignatura analizada contribuyó a aumentar los conocimientos de los estudiantes de enfermería en torno al fenómeno de las adicciones. En cuanto a las competencias percibidas, aunque aumentaron significativamente, tendrían que demostrarse a la

luz de escenarios prácticos que confirmen su persistencia e impacto en la calidad del cuidado.

Descriptores: investigación en educación de enfermería; trastornos relacionados con sustancias; conocimiento; percepción.

Efeito de uma disciplina de enfermagem nos conhecimentos e competências percebidas para o cuidado de usuários de drogas

Resumo

Objetivo. Identificar o efeito de uma disciplina sobre dependências nos conhecimentos e habilidades percebidas por estudantes de Bacharelado em Enfermagem para cuidar de usuários de drogas. **Métodos.** Estudo pré-experimental de grupo único com medidas pré-teste e pós-teste. Trabalhamos com uma amostra de 59 alunos matriculados no sétimo semestre de uma universidade pública do nordeste do México, que receberam 64 horas teóricas da disciplina "Enfermagem diante das dependências", ministrada em aulas presenciais. ensinando enfermeiros com formação no cuidado de dependências. A ênfase foi teórica, onde foram utilizadas estratégias como casos clínicos, instrumentos de triagem e material audiovisual. Foram coletadas informações sobre dados sociodemográficos e aplicada a escala de conhecimentos e competências percebidas sobre o cuidado de usuários de álcool e outras drogas de Happel *et al.* **Resultados.** No pós-teste, foram registradas pontuações mais altas nas subescalas conhecimento geral sobre o uso de substâncias ($W = -4.532$, $p < 0.001$), conhecimento percebido sobre o manejo de usuários de drogas ($W = -5.909$, $p < 0.001$) e percepção competências para cuidar de usuários de álcool e drogas ($t = -8.000$, $p < 0.001$). **Conclusão.** A temática analisada contribuiu para ampliar o conhecimento dos estudantes de enfermagem sobre o fenômeno das dependências. Quanto às competências percebidas, embora tenham aumentado significativamente, teriam que ser demonstradas à luz de cenários práticos que confirmassem a sua persistência e impacto na qualidade dos cuidados.

Descritores: pesquisa em educação em enfermagem; transtornos relacionados ao uso de substâncias; conhecimento; percepção

Introduction

Consumption of legal and illegal drugs poses a serious problem to public health, not only due to the high costs associated with their medical care, but also due to the numerous effects and consequences for the individual, the family, and the community.[1] Las legal and illegal drugs, both under the denomination of psychoactive substances, are characterized for altering the central nervous system, causing disorders in the person's judgment function, behavior, mood, and a long list of related pathologies.[2] Due to their effects on the cerebral structures involved in the perception of pleasure, are likely to create dependence (*i.e.*, cause intense and persistent desire for the substance, as well as difficulties in controlling its consumption).[3]

Over the course of recent years, concern about drug consumption has increased, especially among young people. As evidence of this, almost two-thirds of premature deaths and one-third of the total burden of disease in adults are associated with diseases or behaviors that have their onset in youth, among them legal drug consumption.[4] In fact, according to the World Health Organization, in 2020, over 1.5-million adolescents and young adults between 10 and 24 years of age died, equivalent to almost 5,000 deaths per day. Among the principal causes of death are injuries and traumas (including those caused by traffic accidents), violence, and self-harming behaviors. The foregoing demands actions aimed at preventing any type of addiction, as well as diminishing the consumption of psychoactive substances.[5] In this sense, a line of action promoted to limit the spread of addictions is the training of health professionals in the area of drug addiction, especially since their university formation.[6-8] The case of nursing stands out, a discipline with a wide presence at all levels of the health system. However, when students graduate from the Nursing career, they often do not have sufficient knowledge about the drug phenomenon; an adverse situation for nursing students is that, as preventive agents, they also constitute a vulnerable population for experimentation and substance abuse, given their development stage and the context in which they perform. For example, a multicenter study carried out with nursing students[9] determined that 36.1% consumed some type of illegal drug, more commonly marihuana (35.9%), ecstasy (6.9%), and cocaine (5.8%). Not less relevant is the consumption of legal drugs; regarding tobacco, a study conducted in Spain [10] determined overall prevalence around 29.7%. Furthermore, it is estimated that 61.0% of nursing students in a study conducted in the United States [11] have recurred to episodic excessive alcohol consumption (that is, drinking five or more alcoholic beverages per occasion).

Added to the high prevalence mentioned, students may have inconsistent knowledge about drugs. For example, in a research with students from the

Nursing program at Universidad Autónoma de Coahuila, Mexico,[12] 70.9% of the participants had a low level of knowledge about caring for patients who consume alcohol and tobacco. In another research in Peru, students described the risks of consuming alcohol and tobacco as quite dangerous, but classified marihuana consumption as slight health risk.[13] Situations, like the aforementioned, evidence broad areas of opportunity in terms of education on the phenomenon of addictions among nursing students. Unfortunately, at least within the context of Mexico, many higher education institutions that have a Nursing program do not include specific subject assignments or sufficient program content that permit students to care for patients with drug addictions. This is so, despite efforts aimed at establishing specific nursing skills to reduce drug demand.[14,15] Thereby, although it is important for education authorities to include assignments to acquire the knowledge and skills required for prevention and caring for drug users, it is also a priority for professors and researchers to evaluate the educational benefits offered by said subjects; this is because it is rarely determined how capable students are based on programs implemented.

Under that perspective, this study represents an effort to explore student learning in an undergraduate Nursing program located in northeastern Mexico, who were registered in a specific subject on addictions, of recent implementation and with a duration of 16 weeks. Although prior local research has been carried out [16] on the personal benefits this subject assignment could bring to students (in terms of changes in their beliefs and intentions to consume), what is still unknown are the cognitive characteristics with which students end up (which are related to improved quality of patient care). Due to the foregoing, the aim of this study was to identify the effect of a specialized subject assignment on addictions on the knowledge and skills perceived by undergraduate nursing students to care for drug users.

Methods

This research had a single-group pre-experimental design[17] with pre- and post-test measurements. The group subjected to the educational intervention included 59 university students from three classrooms that received the subject assignment "Nursing and addictions". The inclusion criteria were to be a student formally enrolled in the regular period of the undergraduate Nursing program. Given that all the classrooms from the same academic period took the subject assignment, no equivalent comparison group could be found. The participants were in their daily classroom environment (classrooms with face-to-face modality), with the condition of not missing more than three sessions during the entire period (the average was 0.40 absences, SD = 0.68). The study was conducted during the first half of 2022 (third cohort since the subject was included in the nursing curriculum, during the second half of 2019). The sample size was sufficient to detect an effect size from $d = 0.4$, considering an alpha error of 0.05 and power of 83.8% to perform repeated measurements analysis under a non-parametric test (for parametric tests of repeated measurements the power was 85.5%).

The undergraduate Nursing program is conformed of 10 semesters, with the last two corresponding to a type of internship (denominated social service in Mexico). The subject assignment is offered as an elective during the seventh semester (that is, education authorities can substitute it for any other subject in certain academic periods). The class is made up of 64 hours, administered four hours per week. Three professors with previous experience in teaching the subject participated: one had a master's degree and two had PhD degrees in nursing sciences; in all cases, they had trajectories in research on addictions. At the time of the study, it was a subject with a theoretical emphasis because it was not accompanied by mandatory hours of specialized practice outside the classroom (partly due to the lack of specialized areas of care for drug addictions). The subject

addresses the neuropsychological theoretical foundations underlying the development of addictions, the symptomatology, diagnosis, and treatment of legal and illegal substances, as well as nursing care. Teaching and learning strategies were used, such as clinical cases, application of screening instruments, and emergency care videos. The pre-test measurement was made prior to the first session and the post-test measurement was carried out after completing the period of classes (but shortly before the final ordinary evaluation of the subject assignment).

The instruments used for the measurements were: (i) a data sheet consisting of 17 questions aimed at identifying sex, age, experience in caring for alcohol or drug users, and the prevalence of personal use of substances (alcohol, tobacco, marihuana, heroin, cocaine, amphetamines/methamphetamines and controlled medications); and the prevalence measurements included consumption of the aforementioned psychoactive substances at some point in life, that is, the global prevalence; and (ii) the Scale on perceived knowledge and skills regarding the care of drug users developed by Happel *et al*.,[18] aimed originally at knowing the needs and areas of opportunity of health professionals to work with alcohol and drug users.

For the purposes of this research, a prior pilot test was carried out on a sample of 25 nursing students, where understanding and reliability were assessed. The questions in this instrument belong to four areas considered relevant among the staff caring for drug users: (i) general knowledge on substance use, (ii) frequency of recording substance use history; (iii) perceived knowledge on management of drug users; and (iv) perceived competences to care for drug users. Of the four areas mentioned, the items of the second one, aimed at knowing the occasions in which the student takes a record of the consumption of substances in drug-addicted patients, were not applied. The foregoing is based on the fact that a considerable proportion of the sample had never practiced caring for patients with drug addiction, so the post-test measurements would be a biased. With respect to the area of overall knowledge on substance use, it is composed of 17 multiple-option items (11 items of three options and six of two options). These questions address mainly knowledge on drug generalities, treatments, and symptoms in substance users. In all the questions, only one of the options is considered correct (coded dichotomously with the value 1 as the reference for successes), so that the score ranges between 0 and 17 points (higher scores mean greater knowledge). Because there was no established cut-off point, any score above the absolute mean of this subscale (8.5 points) was considered an indicator of the minimum acceptable knowledge threshold.

The subscale of perceived knowledge on management of drug users includes eight Likert-type items with four options (from *Much knowledge = 3* to *No knowledge = 0*). The score ranges between 0 and 24 points; a higher score suggests greater perception of knowledge about nursing care in addictions. In this research it was identified that it has an adequate Cronbach's alpha coefficient of 0.848. Finally, the competency subscale for caring for drug users has 10 Likert-type items with four options (from *Very competent = 3* to *Not competent = 0*); the score ranges from 0 to 30 points. A higher score indicates that the participant feels more competent or skilled in working with users of alcohol or other drugs. The reliability of this subscale is satisfactory (? = 0.934).

Regarding the data collection procedures, the first step consisted in securing authorizations from the institutional research and ethics committees. Once this was achieved, the necessary arrangements were made with the educational authorities. The researchers personally invited the students to their respective classrooms (just before their classes began); orally explained the objective of the study and collected written informed consents. At this point, 68 students accepted to participate, and

applied the pre-test measurement. Administration of the instruments took just over 15 minutes. From that moment on, the students were allowed to continue their classes and activities as normal. Precisely at the end of the subject (16 weeks later), but before the regular or final evaluation, the post-test measurement was taken. At the end of the study there was a loss of nine participants (that is, an attrition of 13.23%). Said cases corresponded to students who abandoned or postponed their studies and their exclusion determined the final sample size.

The analyses included descriptive and inferential statistics. Regarding the descriptive approach, measures of centrality, dispersion, as well as frequencies and relative frequencies (%) were used. The inferential approach focused on the comparison of repeated measurements. Thus, using the Kolmogorov-Smirnov test with Lilliefors correction, it was decided that for numerical variables that had a normal distribution ($p > 0.05$) the *t* test for related groups was appropriate. On the other hand, the Wilcoxon test was used when a normal distribution was not presented ($p < 0.05$). The McNemar test was used to compare categorical variables between repeated measurements. For comparisons between two independent groups, the non-parametric Mann-Whitney U test was used. Analyses were performed in SPSS version 24.0 (for the OSX operating system).

This study complied with national ethical dispositions (regulation of the general health law on research in Mexico) and international ones in force (Declaration of Helsinki). It was characterized by being anonymous, confidential and voluntary, where informed consent was required and signed by the participants. It was also approved by the institutional Research and Ethics Committee (registration CA-A017-2018).

Results

Regarding the descriptive data of the participants, the majority were women (83.1%, $f = 49$) with a mean age of 21.54 ± 1.02 years. At the beginning of the study, more than half reported not having had any experience caring for alcohol or drug users (55.9%, $f = 33$). The overall prevalence of substance use among students was as follows: alcohol 89.8% ($f = 53$), tobacco 50.8% ($f = 30$), marihuana 33.9% ($f = 20$), controlled drugs 5.1% ($f = 3$), cocaine 3.4% ($f = 2$), and amphetamines 1.7% ($f = 1$).

On the general objective of the study (identifying the effect of a subject assignment on addictions on the perceived knowledge and skills to care for drug users), Table 1 shows that significant changes were noted at the end of the research. It is noteworthy that towards the post-test measurement, higher raw scores were recorded for general knowledge on substance use, perceived knowledge on management of drug users, and perceived competences to care for alcohol and drug users. That is, all three indicators improved after completing the assignment program.

Table 1. Differences between perceived knowledge and skills to care for drug users upon completing the study

Variables	Pre-test		Post-test		Test statistic
	M± *SD*	*95% CI M*	*M*± *SD*	*95% CI M*	
Overall knowledge on substance use	8.71±1.70	8.26-9.15	10.15±1.85	9.66-10.63	$W = -4.532^{*}$
Perceived knowledge on management of drug users	8.83±3.97	7.79-9.86	14.27±4.00	13.22-15.31	$W = -5.909^{*}$
Perceived competences to care for drug users	12.37±5.94	10.82-13.92	19.06±4.93	17.78-20.35	$t = -8.000^{*}$

Note: *t* = *t* test for two related groups; 95% CI M = confidence intervals at 95% around the mean; *W* = Wilcoxon's test; $^{*}p < 0.001$

Specifically, in the area of general knowledge on substance use, upon analyzing its items, of the eight with significant changes (Table 2), five were about knowledge related to alcohol use. In fact, in this subscale it is estimated that on the moment of the pre-test 57.6% ($f = 34$) of the participants exceeded the minimum threshold of 8.5 points, a situation that increased to 84.7% ($f = 50$) on the moment of the post-test. In percentage terms, the pre-test moment registered 50.01% correct responses, while increasing in the post-test to 56.99%

Table 2. Some items from the area of overall knowledge on substance use registering significant changes

Items	Pre-test %	Post-test %	Test statistic
2. Maximum recommended amount of alcohol that men can consume in one day	20.3	69.5	$\chi^2 = 27.129^{***}$
3. Maximum recommended amount of alcohol that non-pregnant women can consume in one day	62.7	78.0	$\chi^2 = 4.764^{*}$
5. Vitamin that patients with alcohol dependence should take to avoid memory problems and confusion	27.1	66.1	$\chi^2 = 19.592^{***}$
10. Warning sign warns of possible heroin overdose in sleepy patients with erratic behavior	39.0	61.0	$\chi^2 = 7.347^{**}$
11. Upon suspicion of heroin overdose in a nonreactive patient, what medication should be administered immediately?	32.2	66.1	$\chi^2 = 12.500^{***}$
12. The diagnosis of dependence on a substance is characterized by the need for a marked increase in the amount of the drug to achieve the effect desired by the user.	69.5	88.1	$\chi^2 = 6.368$*
15. The use of a benzodiazepine is appropriate to manage alcohol withdrawal symptoms.	40.7	62.7	$\chi^2 = 5.827^{*}$
17. Many symptoms associated with alcohol withdrawal can be adequately managed without medication.	47.5	78.0	$\chi^2 = 11.571^{***}$

Note: Percentages refer to the number of right answers in each item; X^2 = McNemar test statistic; $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.001$

To end, given that 55.9% of the participants reported having had some type of experience of caring for drug users, and 35.6% of them consumed some illicit substance in their lifetime, it was analyzed if said attributes constituted confounding variables. In this sense, it was identified that those with prior care experience, began the study with more perceived knowledge ($U = 242.00$, $p = 0.004$), although they did not have more general knowledge ($U = 382.00$, $p = 0.465$) or perceived competences ($U = 394.50$, $p = 0.598$). Figure 1A illustrates how the mean of perceived knowledge on management of drug users during the pre-test was higher among those with prior care experience ($M = 10.50$, $Med = 11.0$) compared with those who did not have such experience ($M = 7.51$, $Med = 9.0$). However, it is noteworthy that this attribute did not seem to be a determining factor in the fact that on completion of the study an increase in any of the three indicators of interest was recorded, given that the intergroup comparisons were not significant ($p > 0.05$). This can be seen from the relative closeness and parallelism of the scores of both groups of students in the post-test.

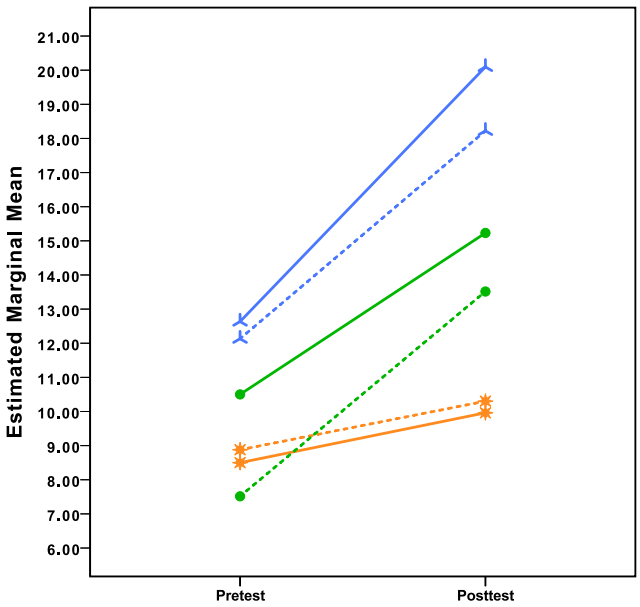

Figure 1A

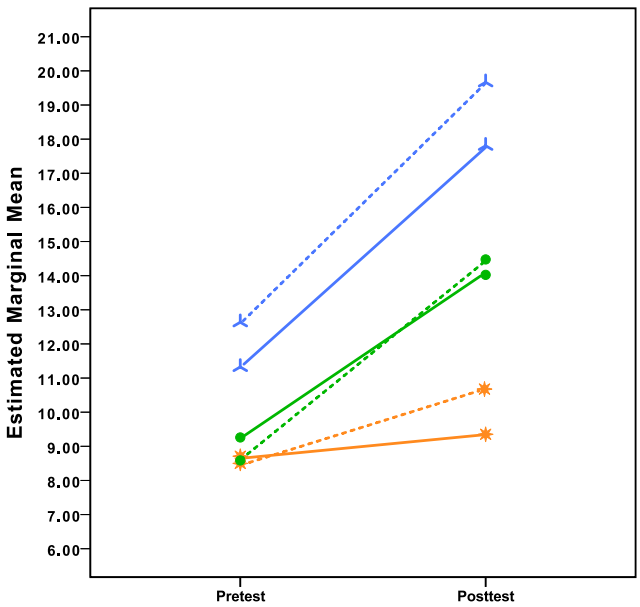

Figure 1B

Figures 1A and 1B. Study indicators in function of: A- Prior experience in caring for alcohol and drugs user, and B- Consumption of any illegal drug

Note: In Figure 1A: ---- Students without prior experience; ___: students with prior experience; in Figure 1B: ---- Students who have not consumed any illegal substance in their lives; ___: students who have consumed any illegal substance in their lives. For Figures 1A and 1B: ✷: general knowledge; ●: perceived knowledge; ⅄: perceived competences

In the case of those who consumed any illegal substance (Figure 1B), they began the study with similar indicators compared to their non-consumer peers: perceived knowledge (U = 352.50, p = 0.459), general knowledge (U = 398.50, p = 0.994), perceived competences (U = 350.00, p = 0.437). Nonetheless, upon analyzing the measurements during the post-test, significant differences were found in general knowledge scores (U = 248.50, p = 0.015). It can be noted that the score was higher among non-consumers of any illegal substances during their lifetime (M = 10.55, Med = 11.0) compared to those who consumed them (M = 9.42, Med = 9.0). Although a causal direction cannot be determined, this suggests that consumption of any illicit substance is an attribute to consider when interpreting the analyses.

Discussion

Through this study, it was identified that participants who received the assignment on nursing care for drug users experienced significant improvement in terms of general and perceived knowledge on substance use, as well as in the skills perceived to care for alcohol and drug users. With respect to overall knowledge acquired by the participants, improvements identified are in line with the literature that points out the benefits of formal subject assignments on addictions in terms of filling the knowledge gaps of nursing professionals.[19] Nevertheless, an outstanding aspect is that – at least from the theoretical point of view – the knowledge gained by the students places them at levels comparable to those reported in studies carried out in countries, such as Australia. For example, Happel *et al.,*[18] conducted a survey among health professionals to verify their knowledge regarding caring for users of alcohol and other substances. Their sample was comprised by 79.89% nursing professionals with > 10 years of clinical experience (71.7%). Using the same instrument as our study, they determined that, averaging all the items, there was 61.88% of correct answers; not distant from the 56.99% with which the students in the present study ended. Something similar was reported by Carta *et al*.,[20] who implemented a two-day educational workshop to increase knowledge and attitudes with respect to alcohol and drug use. Said study recruited a sample of 378 professionals specialized in mental health; of which 77.5% were nursing staff and > 60.0% had over 10 years of professional experience. The right answers obtained in the pre-test measurement were 60.45% with the same instrument.

As observed, in the Australian research, most of the nursing staff had professional experience and even greater academic formation (not leaving aside that these would be professionals trained in a country with high levels of development). These could be aspects that prevent a fair comparison with our data, but which put the percentages achieved by the students into context, given that the majority of our students have never provided care in addictions and had less clinical experience at the moment of the study (consider that the clinical experience could include training opportunities on addictions, care for drug addiction users, or of interaction with other trained professionals). It will be important to determine if knowledge is implemented directly during their professional practice, besides persisting over time. Currently, no measurements are available to permit corroborating these aspects.

With regards to scores on perceived knowledge and skills to care for drug users, although often not listed as the main objective of the subject assignments, psychological theories suggest that perceptions could be relevant as precursors of behaviors.[21] Therefore, these should also be of interest for academia. In this case, if we wish to promote adequate care for drug users (this is a behavior), it is also useful – and probably necessary – to elevate the set of determinants proximal to said behaviors, such as perceptions, beliefs, and intentions. In this sense, given that individuals tend to interpret information selectively according with their beliefs and prior experiences,[21,22] the

subject assignments constitute opportunities to influence on said constructs through information and activities carried out. Other studies[16,23] have demonstrated that this assignment permits modifying personal beliefs with respect to drugs, so it is expected that this will translate into the execution of desirable behaviors in the future. However, the lack of clinical practice associated with this subject remains as a major pending issue, which could provide experiences that facilitate behavioral changes through improving perceived behavioral control.

Following the same line of theories that explain the determinants of behaviors,[21,22] the effect that previous substance use by students could have is discussed (which in this study was high because 35.6% had used some illicit substance at some point in their lives). Although at the beginning of the study the consuming and non-consuming students started on equal terms, at the time of the post-test there were differences in favor of the non-consumers in terms of the overall knowledge acquired. Even if it is not possible to determine whether consumption of illegal substances is the determinant of poor performance, it is important to consider that the socioeconomic, emotional, and physiological context of users is often adverse, which could have an impact on learning processes. Likewise, the literature is clear that health professionals who are active users (or who have positive attitudes towards drugs) may be less efficient agents,[24] given the repercussions of substance consumption on beliefs, attitudes, and motivations. Thus, although measuring and addressing student involvement with substances is beyond traditional academic purposes, it may be necessary for nursing educators to direct care actions toward students. According to the theoretical postulates mentioned, said actions could indirectly improve the quality of care provided by graduates.

It is important to highlight that diverse limitations exist in relation to this study. Inherent to the study design, by not having a control group, it is not possible to determine whether the changes are totally attributable to the subject assignment and not to other uncontrolled factors (such as age, gender, or beliefs). Also, because there was no random selection and the study was located in a very specific geographic context, it is difficult to generalize the findings to other populations or educational contexts. In fact, the city where the study took place has been characterized by the continuous presence of illegal substance trafficking, so that the local population could have particularities (cultural and psychological) that would not be seen in other areas of the country. It would also be appropriate to carry out medium-term follow-ups, since the study only measured the immediate effects of the subject assignment. In that sense, knowledge can diminish over time, especially if not put into practice. In addition, some threats to internal validity include relying on self-reporting instruments and a lack of control over possible changes that may occur in participants throughout the study (for example, learning by means other than through the subject assignment). It is recommended to take these limitations into account when designing future research to fully understand the effects of the subject assignment.

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Social determinants of health and exclusive breastfeeding: a longitudinal study

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Social determinants of health and exclusive breastfeeding: a longitudinal study

Abstract

Objective. To analyze the social determinants of health of exclusive breastfeeding on the 7th and 27th day after delivery. **Methods.** A longitudinal, multicenter study with a quantitative approach was conducted with postpartum women and newborns in three maternity hospitals in the state of Espírito Santo (Brazil). The sample consisted of 2,325 and 1,819 mother/baby pairs on the 7th and 27th day, respectively. The variables that most influence women in exclusive breastfeeding were assessed by logistic regression. **Results.** The rate of exclusive breastfeeding seven days after delivery was 80.7% and 79.2% on the 27th day. The social determinants of health up to the 27th day after delivery that were related to exclusive breastfeeding aimed at the mother were: mother's age up to 19 years (OR 1.9); and in newborns, the following stood out: full-term baby (OR 2.2) and no difficulty in EBF

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(OR=8.8). **Conclusion.** The relationship between social determinants of health such as maternal age, gestational age of the baby at birth and difficulties in breastfeeding influence the practice of EBF.

Descriptors: breastfeeding; social determinants of health; newborn.

Determinantes sociales de la salud y lactancia materna exclusiva: un estudio longitudinal

Resumen

Objetivo. Analizar los determinantes sociales de la lactancia materna exclusiva (LME) en los días 7 y 27 después del parto. **Métodos.** Estudio longitudinal, multicéntrico, con abordaje cuantitativo, realizado con puérperas y recién nacidos en tres maternidades del estado de Espírito Santo (Brasil). La muestra consistió en 2325 y 1819 binomios madre/bebé en el 7º y 27º día, respectivamente. Las variables que más influyeron en las mujeres en la LME fueron evaluadas por regresión logística**.** **Resultados.** La tasa de LME a los siete días del parto fue del 80.7% y del 79.2% al 27º día. El determinante social de la salud hasta el 27º día tras el parto que se relacionó con la LME para la madre fue la edad hasta 19 años (OR 1.9); y para el recién nacido: el haber nacido a término (OR 2.2) y no tener ninguna dificultad para amamantar (OR=8.8). **Conclusión.** La relación entre determinantes sociales de la salud como la edad materna, la edad gestacional del bebé al nacer y las dificultades para la lactancia materna influyen en la práctica de la LME.

Descriptores: lactancia materna; determinantes sociales de la salud; recién nacido.

Determinantes sociais da saúde e aleitamento materno exclusivo: um estudo longitudinal

Resumo

Objetivo. Analisar os determinantes sociais de saúde do aleitamento materno exclusivo (AME) no 7º e no 27º dia após o parto. **Métodos.** Estudo longitudinal, multicêntrico, com abordagem quantitativa realizado com puérperas e recém-nascidos, em três maternidades do estado do Espírito Santo (Brasil). A amostra foi composta por 2325 e 1819 binômios mãe/bebê no 7º e no 27º dia, respectivamente. As variáveis que mais influenciam as mulheres na amamentação exclusiva foram avaliadas por regressão logística. **Resultados.** A taxa de aleitamento materno exclusivo sete dias após o parto foi de 80.7% e de 79.2% no 27º dia. Os determinantes sociais de saúde até o 27º dia após o parto que estiveram relacionados ao aleitamento materno exclusivo voltados para a mãe foram: idade da mãe até 19 anos (OR 1.9); e no recém-nascido destacaram-se: bebê nascido à termo (OR 2.2) e não ter dificuldade no AME (OR=8.8). **Conclusão.** A relação dos determinantes sociais de saúde como idade materna, idade gestacional do bebê ao nascer e dificuldades na amamentação influenciam na prática do AME.

Descritores: aleitamento materno; determinantes sociais de saúde; recém-nascido.

Introduction

Exclusive breastfeeding (EBF) in the first 6 months of life is considered the most complete diet for newborns, as it provides all the energy, vitamins, and minerals that infants need. After this period, breastfeeding must continue until at least 2 years of age, even after the introduction of solid foods.[1] This is because it is the most economical and effective form of protection against infant mortality, diarrheal diseases, respiratory infections, allergies, and other conditions, in addition to being a protective factor against maternal breast cancer and promoting better orofacial development in children.[2,3] The National Study on Child Feeding and Nutrition (ENANI) carried out in 2019 showed that, despite Brazil's progress in breastfeeding, less than half of children aged 0 to 6 months were being exclusively breastfed (45.7%)[4]. This data contradicts the global target presented in the 2030 Agenda for Sustainable Development Goals, which proposes to reach at least 50% of EBF in the first 6 months of life by 2025 and 70% by 2030.[5] In addition, the prevalence of continued breastfeeding in the first year of life (among children aged 12 to 23 months) in the country was 43.6%, with the median duration of EBF being three months, according to ENANI-2019.[4]

There are several factors related to the choice of not breastfeeding or stopping breastfeeding early. Studies suggest that conditions such as previous obesity or overweight, low education level, cesarean section, perception of insufficient breast milk, maternal illness, refusal to breastfeed, return to work or school, infant illness and cultural factors directly influence this decision.[6-8] In addition to the primary role of health care provided to mothers, from prenatal care, delivery, puerperium until the first months of the baby's life, where nursing plays a leading role in care, mainly through education and health promotion in primary health care.[9] In view of this, it is important to be aware of the social factors that determine the health of infants and mothers. Thus, theorists such as Dahlgren and Whitehead[10] describe the social determinants of health as factors related to the population's living and working conditions that influence its health status. The model described by them is widely used, precisely because it addresses the relationships between social factors and individual and collective health.[10] In addition to this broader understanding of the social determinants of health, in an attempt to understand more deeply the factors that affect breastfeeding, the Lancet Breastfeeding Series Group, based on a systematic review, proposed a conceptual model to identify the components of an environment conducive to breastfeeding, classifying the determinants into three categories: 1) structural; 2) environmental; and 3) individual. This framework provides a theoretical basis for exploring the specific determinants of breastfeeding in different sociocultural contexts.[3,8] Despite the large number of studies on the SDH (Social Determinants of Health) of EBF, few address EBF

adherence on the 7th and 27th days after birth, which justifies the question of this research: what are the social determinants of health of exclusive breastfeeding on the 7th and 27th days after birth? Therefore, it is essential to understand the barriers that EBF faces and to identify the nuances of this process, so that it is possible to outline actions directed to the needs of each population. Thus, this study aims to analyze the social determinants of health of exclusive breastfeeding on the 7th and 27th day after delivery.

Methods

Type of study, population, and sample. This is a longitudinal, multicenter study with a quantitative approach that used data from the Viver Project.[10] This study was conducted with postpartum women and newborns in two maternity hospitals in the metropolitan region and in one maternity hospital in the northern region of the state of Espírito Santo, in the southeast of Brazil. The maternity hospitals that participated in the study were selected based on the following aspects: a) those that performed the most deliveries in the region; b) being located in one of the two health regions; c) having a diversity of care, with 80% to 100% coverage by the Unified Health System and 100% private or covered by supplementary health insurance. The population of the Viver Project corresponds to all mothers and children born alive or who died in the perinatal period. They were invited to participate in the study from August 2019 to January 2020, resulting in an initial population of 5,369 mother/baby binomials. The study sample was a census sample, as it included the entire population of mothers of children born in the three maternity hospitals that met the selection criteria, covering the entire universe investigated during the study period.

Techniques and Procedures. To conduct this study, the sample investigated was composed of two moments: 7th and 27th days after delivery, including two samples of mother/baby dyads, with 2,325 and 1,819, respectively. With a percentage of losses and refusals of 21.7% (*n* = 506) between the two periods. To capture the study sample, an interview was initially conducted in the maternity hospital, before hospital discharge. From that moment in question, for this study, sociodemographic and prenatal-related variables were used. The independent variables investigated in the study were: maternal characteristics, at both time points, consisting of age group, marital status, race, maternal years of schooling, maternal employment, family income, socioeconomic status according to the Brazilian Association of Research Companies, which uses the purchasing power of families as a classification criterion, from highest (A) to lowest (E), number of people living in the same household, use of alcohol and/or tobacco and use of illicit drugs. Variables related to breastfeeding: feeding and deleterious oral habits investigated on the 7th and 27th days of the babies' lives. Data collection was performed by telephone survey, using a previously prepared research instrument, on the 7th and 27th days of the child's life. However, in order to minimize segment losses, a characteristic of this type of study, the first monitoring was carried out between the 7th and 10th day after birth and the second between the 27th and 30th day, by a team trained for this purpose.

Data analysis. A descriptive analysis of the data was carried out using frequency tables with numbers and percentages. The variables that most influence women in exclusive breastfeeding were assessed by logistic regression. The significance level adopted was 5%. The statistical package IBM SPSS 20 – was used for this analysis.

Ethical aspects. The study was approved by the Human Research Ethics Committee of the University of Vila Velha (CAAE 02503018.0.0000.5064). The Informed Consent Form was signed by the mother or guardian of the child, while still in the maternity ward, and they were instructed that they would be contacted by telephone to continue the research.

Results

In total, 2,325 and 1,819 postpartum women were interviewed on the 7th and 27th days, respectively. The predominant age range was between 20 and 34 years, at both times, 69.5% and 68.7%. Of these, the majority lived with a partner, 82.4% and 82.7%, respectively and 48.7% declared themselves to be brown. Regarding years of study, 55.7% and 58.1% studied for 12 years or more, and 53.8% and 56.3% had a job. The predominant family income was up to two minimum wages, representing 45.8% and 44% of the times investigated. It was found that 39% and 40.2% of the study samples belonged to socioeconomic class B and lived with four to six people in the same household, corresponding to 51.9% and 51.7%. There is no statistical significance between the two moments, that is, the samples from the two periods investigated are equivalent (Table 1).

Table 1. Maternal data on the 7th and 27th days of the newborn's life

Characteristic	7th day (*n*=2325)		27th day (*n*=1819)		*p*-value
	n	%	*n*	%	
Age group					
Up to 19 years	270	11.6	204	11.2	0.571
20 – 34 years	1617	69.5	1249	68.7	
35 years or older	438	18.8	366	20.1	
Marital status					
Lives with partner	1916	82.4	1504	82.7	0.973
Does not live with partner	268	11.5	206	11.3	
Not declared	141	6.1	109	6.0	
Race					
White	648	27.9	503	27.7	0.888
Mixed	1133	48.7	886	48.7	
Black	433	18.6	342	18.8	
Yellow	16	0.7	14	0.8	
Indigenous	2	0.1	0	0.0	
Not declared	93	4.0	74	4.1	
Years of education					
Up to 4 years	19	0.8	14	0.8	0.567
5 – 8 years	224	9.6	158	8.7	
9 – 11 years	507	21.8	388	21.3	
12 years or more	1295	55.7	1057	58.1	
Not declared	280	12.0	202	11.1	
Works					
Yes	1250	53.8	1025	56.3	0.248
No	1059	45.5	783	43.0	
Not declared	16	0.7	11	0.6	

Table 1. Maternal data on the 7th and 27th days of the newborn's life (Cont.)

Characteristic	7th day (*n*=2325)		27th day (*n*=1819)		*p*-value
	n	%	*n*	%	
Family income in minimum wages					
Up to 1	485	20.9	357	19.6	0.853
Between 1 and 2	580	24.9	444	24.4	
Between 2 – 3	401	17.2	326	17.9	
Between 3 – 4	172	7.4	139	7.6	
Between 4 – 5	205	8.8	177	9.7	
More than 5	259	11.1	211	11.6	
Not declared	223	9.6	165	9.1	
Socioeconomic status					
A	381	16.4	317	17.4	0.156
B	907	39.0	732	40.2	
C	893	38.4	683	37.5	
D	118	5.1	72	4.0	
E	5	0.2	0	0.0	
Not declared	21	0.9	15	0.8	
People living in the household					
0 – 3	984	42.3	779	42.8	0.968
4 – 6	1206	51.9	940	51.7	
7 or more	84	3.6	63	3.5	
Not declared	51	2.2	37	2.0	
Total	2325	100.0	1819	100.0	

Of the 80.7%, 79.2% remained on EBF on the 7th day and 27th day on 79.2%. 19.3% on the 7th day, and 20.8% received complementary feeding on the 27th day. Of these, 86% on the 7th day and 83.4% on the 27th day were fed with human milk and industrialized formula (Table 2). Regarding difficulty in breastfeeding, 89.1% and 78.2% did not present this difficulty on the 7th and 27th days (Table 2). The data focused on deleterious oral habits investigated on the 7th and 27th days after birth showed that 79.6% and 73.8%, respectively, did not perform finger sucking. On the 7th day, 66.9% did not use a pacifier, a practice that decreased to 57.4% on the 27th day. The non-use of a bottle was characterized by 91% on the 7th day and 76.1% on the 27th day (Table 2).

Table 2. Data on breastfeeding, feeding and harmful oral habits of babies on the 7th and 27th days after delivery

Characteristic	7 days after delivery		27 days after delivery		*p*-value
	n	%	*n*	%	
Exclusive breastfeeding					
Yes	1876	80.7	1441	79.2	
No	449	19.3	378	20.8	<0.0001
Not declared	1113	-	1619	-	
Complementary feeding					
Industrialized formula	32	14.0	61	16.6	
Human milk + formula	197	86.0	307	83.4	<0.0001
Human milk	0	0.0	0	0.0	
Not declared	220	-	10	-	
Difficulty breastfeeding					
Yes	505	21.8	195	10.9	
No	1815	78.2	1593	89.1	<0.0001
Not declared	1118	-	1650	-	
Digital sucking					
Yes	478	20.4	478	26.2	
No	1860	79.6	1347	73.8	<0.0001
Not declared	1100	-	1613	-	
Baby uses a pacifier					
Yes	774	33.1	775	42.6	
No	1561	66.9	1046	57.4	<0.0001
Not declared	1103	-	1617	-	
Use of bottle					
Yes	209	9.0	434	23.9	
No	2122	91.0	1379	76.1	<0.0001
Not declared	1107	-	1625	-	

Regarding EBF on the 7th day and the determinants related to mothers, Table 3 shows a relationship with marital status. Mothers with a partner were more likely to maintain EBF (adjusted OR = 1.86; 95% CI = 1.28-2.72) than those without a partner. In addition, the relationship between EBF and alcohol and/or tobacco consumption and not using illicit drugs was also significant. It was revealed that women who consumed alcohol and/or tobacco and who did not use illicit drugs had 1.82 and 2.99 chances of practicing EBF, respectively (adjusted OR = 1.82; 95% CI = 1.15 - 2.87; adjusted OR = 2.99; 95% CI = 1.24 - 7.17).

Table 3. Maternal data and the relationship between exclusive breastfeeding seven days after delivery

Characteristic	Without EBF		With EBF		Sig.	OR	Adjusted OR
	n	%	*n*	%			
Age group							
Up to 19 years	47	17.4	223	82.6	0.138	1.154	1.441 (0.890 – 2.335)
20 years or more	402	19.6	1653	80.4			
Marital status							
With partner	359	18.7	1557	81.3	0.001	1.563	1.869 (1.280 – 2.728)
Without partner	71	26.5	197	73.5			
Race							
White	129	19.9	519	80.1	0.783	1.078	1.043 (0.775 – 1.403)
Non-white	297	18.8	1287	81.3			
Years of education							
Up to 11 years	138	18.4	612	81.6	0.685	1.066	1.065 (0.786 – 1.443)
12 years or more	251	19.4	1044	80.6			
Works							
Yes	242	19.4	1008	80.6	0.620	1.006	1.078 (0.801 – 1.451)
No	204	19.3	855	80.7			
Family income							
Up to 2 MW	213	20.0	852	80.0	0.142	1.100	1.288 0.919 – 1.805
Over 2 MW	192	18.5	845	81.5			
Socioeconomic status							
AB	254	19.7	1034	80.3	0.983	1.047	1.004 (0.727 – 1.384)
CDE	193	19.0	823	81.0			
Use of alcohol and/or tobacco							
Yes	53	17.2	255	82.8	0.010	1.175	1.820 (1.153 – 2.874)
No	396	19.6	1621	80.4			
Use of illicit drugs							
No	411	18.7	1784	81.3	0.014	2.026	2.993 (1.249 – 7.172)
Yes	14	31.8	30	68.2			

EBF = Exclusive breastfeeding; OR = Odds Ratio; MW = Minimum wage.

The logistic regression between exclusive breastfeeding on the 7th day and data related to the newborn and care provided during the prenatal period showed that children born with normal weight had 2.52 (adjusted OR = 2.52; 95% CI = 1.48-4.31) chances of practicing EBF than those born with low weight, and mothers who did not have difficulties breastfeeding had 2.701 chances of maintaining EBF than those who had this difficulty (adjusted OR = 2.70; 95% CI = 2.07-3.56) (Table 4).

Table 4. Relationship between exclusive breastfeeding seven days after delivery and data related to the newborn and prenatal care

Characteristic	Without EBF		With EBF		Sig.	OR	Adjusted OR
	n	%	n	%			
Sex NB							
Female	220	20.1	877	79.9	0.390	1.094	1.116 (0.869 – 1.432)
Male	229	18.6	999	81.4			
Newborn weight							
Normal weight	409	18.4	1812	81.6	0.001	2.769	2.526 (1.480 – 4.313)
Low weight	40	38.5	64	61.5			
Gestational age							
Preterm	33	32.7	68	67.3	0.280	2.110	1.378 (0.770 – 2.466)
Full term	408	18.7	1775	81.3			
Primiparous							
Yes	170	21.1	635	78.9	0.517	1.252	2.030 (0.238 – 17.27)
No	211	17.6	987	82.4			
Educational activity							
Yes	100	17.8	461	82.2	0.124	1.139	1.267 (0.937 – 1.714)
No	343	19.8	1388	80.2			
Guidance on EBF							
Yes	395	19.1	1671	80.9	0.268	1.069	1.250 (0.842 – 1.856)
No	45	20.1	179	79.9			
Previous EBF experience							
Yes	176	16.7	879	83.3	0.620	1.330	1.718 (0.202 – 14.62)
No	171	21.0	642	79.0			
Difficulty in EBF							
No	258	14.3	1541	85.7	<0.001	3.086	2.701 (2.079 – 3.561)
Yes	169	34.1	327	65.9			

NB = Newborn; EBF = Exclusive breastfeeding; OR = Odds ratio.

The age group of the mothers analyzed on the 27th day after delivery was shown to be a relevant determinant regarding EBF; mothers up to 19 years old were 1.934 times more likely to practice EBF than those aged 20 or older (adjusted OR = 1.93; 95% CI = 1.07-3.49) (Table 5).

Table 5. Relationship between exclusive breastfeeding twenty-seven days after delivery and data related to the mothers participating in the study

Characteristic	Without EBF		With EBF		Sig.	OR	Adjusted OR
	N%	%	N	%			
Age group							
Up to 19 years	34	16.7	170	83.3	0.029	1.353	1.934 (1.070 – 3.495)
20 years or more	344	21.3	1271	78.7			
Marital status							
With partner	313	20.8	1191	79.2	0.404	1.064	1.209 (0.775 – 1.886)
Without partner	45	21.8	161	78.2			
Race							
White	121	24.1	382	75.9	0.259	1.330	1.196 (0.876 – 1.633)
Non-white	239	19.2	1003	80.8			
Years of education							
Up to 11 years	118	21.1	442	78.9	0.459	1.002	1.133 (0.814 – 1.578)
12 years or more	223	21.1	834	78.9			
Works							
Yes	209	20.4	816	79.6	0.246	1.058	1.211 (0.876 – 1.674)
No	167	21.3	616	78.7			
Family income							
Up to 2 MW	145	18.1	656	81.9	0.625	1.305	1.097 (0.757 – 1.588)
Over 2 MW	191	22.4	662	77.6			
Socioeconomic status							
AB	237	22.6	812	77.4	0.269	1.305	1.222 (0.856 – 1.746)
CDE	138	18.3	617	81.7			
Use of alcohol and/or tobacco							
Yes	49	20.3	192	79.4	0.231	1.032	1.337 (0.831 – 2.149)
No	329	20.8	1249	79.2			
Use of illicit drugs							
Yes	8	22.2	28	77.8	0.777	1.095	1.179 (0.378 – 3.672)
No	355	20.7	1360	79.3			

EBF = Exclusive breastfeeding; OR = Odds ratio; MW = Minimum wage.

Newborns born at term were 2.28 times more likely to practice EBF than those born prematurely (adjusted OR = 2.28; 95% CI = 1.18-4.40). And mothers who reported no difficulty breastfeeding were 8.827 times more likely to maintain EBF on the 27th day after delivery than those who reported this difficulty (adjusted OR = 8.82; 95% CI = 5.98-13.02) (Table 6).

Table 6. Relationship between exclusive breastfeeding twenty-seven days after delivery and data related to the newborn and prenatal care

Characteristic	Without EBF		With EBF		Sig.	OR	Adjusted OR
	N	%	N	%			
Sex of newborn							
Female	178	21.2	663	78.8	0.819	1.044	1.035 (0.769 – 1.394)
Male	200	20.4	778	79.6			
Weight of newborn							
Low weight	28	31.5	61	68.5	0.545	1.810	1.224 (0.636 – 2.357)
Normal weight	350	20.2	1380	79.8			
Gestational age							
Premature	22	28.9	54	71.1	0.014	1.572	2.284 (1.184 – 4.404)
Full term	352	20.6	1359	79.4			
Primiparous							
Yes	123	19.4	510	80.6	0.669	1.062	1.670 (0.159 – 17.49)
No	189	20.4	738	79.6			
Educational activity							
Yes	93	20.9	352	79.1	0.599	1.009	1.097 (0.777 – 1.549)
No	280	20.8	1069	79.2			
Guidance on EBF							
Yes	352	21.6	1281	78.4	0.081	1.647	1.679 (0.939 – 3.003)
No	23	14.3	138	85.7			
Previous EBF experience							
Yes	145	17.9	666	82.1	0.588	1.106	1.913 (0.183 – 19.99)
No	124	19.4	515	80.6			
Difficulty with EBF							
Yes	114	58.8	80	41.2	<0.001	8.475	8.827 (5.983 – 13.02)
No	228	14.4	1359	85.6			

NB = Newborn; EBF = Exclusive breastfeeding; OR = Odds ratio.

Discussion

There are many determinants that affect exclusive breastfeeding, influencing the decision-making of nursing mothers about whether or not to continue with this practice. The EBF rate (80.7% and 79.2%) at both times analyzed, 7th and 27th day after delivery, was satisfactory. The different pro-breastfeeding approaches that are carried out during prenatal care may have contributed to achieving these results. A study showed that 87% of mothers had six or more prenatal consultations, and a scoping review that analyzed the health determinants of EBF reinforced that prenatal care and the number of consultations carried out during this period are determinants for the success of EBF,[12,13] in addition to the lack of difficulty in breastfeeding (78.2% and 89.1%), present in the periods investigated. This determinant is addressed both during prenatal care and, more intensively, during the postpartum period, mainly through nursing care, in which breasts are assessed and guidance is provided regarding possible changes that may occur at the beginning of breastfeeding and how to deal with them. It is known that no anatomical type of nipple can prevent breastfeeding, although its malformation may make it difficult for the baby to latch on correctly. This difficulty can be overcome through scientific and technical knowledge on the part of the health team, as well as knowledge regarding the lactation process.[14]

The marital status of the women studied was a determining factor in EBF on the 7th day after delivery. Those who had a partner were more likely to maintain EBF on the 7th day after delivery than those without this support network. This finding corroborates that found in other studies. In Nigeria, when investigating the importance of a support network for exclusive breastfeeding in the first months of an infant's life, it was shown that support from a partner is crucial for the continuation of this practice.[15] This was also significant in a study conducted in China (OR = 1.91) when the father and close friends provided support in the first month after birth[8]. This finding reinforces that the presence of a husband/partner as support for the mother and newborn contributes to the practice and maintenance of exclusive breastfeeding.

The relationship between alcohol and/or tobacco use and EBF on the 7th day after delivery appeared to be a determinant in this period. As well as not using illicit drugs. It is confirmed that in the second moment, that is, in the perinatal period, the determinant of alcohol and/or tobacco use was not relevant for the analysis. In this context, a study that investigated the outcome of breastfeeding in drug-using mothers on the 7th, 15th, and 30th day after delivery identified a mean EBF of 28.8 days, and mothers who used legal or illegal drugs and continued to be monitored after delivery maintained EBF.[16] The Brazilian Federation of Gynecology and Obstetrics Associations (Febrasgo) and the Ministry of Health contraindicate breastfeeding when the mother is using illegal drugs such as cocaine, heroin, and marijuana, as these and other drugs can pass through the mother's milk and harm the baby, in addition to altering the mother's cognitive behavior, posing a risk to the necessary care for their children.[17,18] The consumption of legal and illegal substances during breastfeeding should be addressed in the context of prenatal and postpartum care, emphasizing the harm this practice causes to the mother/baby binomial. New studies are suggested that can analyze this relationship, alcohol and breastfeeding in more depth in order to explain such causality.

Low birth weight and nipple problems were negatively associated with exclusive breastfeeding in a multicenter study conducted in China.[6] In the study in question, children born with normal weight were more likely to maintain EBF on the 7th day after delivery. Therefore, normal birth weight is a positive determinant of EBF, since the opposite, low birth weight, can lead to the early introduction of infant formulas, without acceptable clinical justification. In these cases, it is

extremely important to evaluate other conditions, such as correct nipple latch when the baby is breastfeeding, and clinical evaluation of the mother's breasts, among others.[19] Studies have identified that previous successful breastfeeding and knowledge about its benefits are factors that are associated with EBF, unlike the findings of this study, which did not find a relationship between previous experience and EBF.[8,20] However, women who did not have difficulty breastfeeding until the 7th day after delivery were more likely to maintain EBF.

Regarding EBF on the 27th day after delivery, maternal age up to 19 years was a significant determinant. A recent study in India, however, showed that maternal age was negatively associated with exclusive breastfeeding.[16] A negative association between maternal age and EBF was also found in another study.[6] Thus, regarding maternal age, the data are in line with the literature, which highlights that adolescent mothers are more likely to wean early. However, the data found raise important points that may justify this finding, such as the role of an effective support network, from the hospital, family, community and, mainly, primary health care, which welcomes and provides specialized assistance to these adolescent mothers.[20]

In addition to these factors, gestational age was shown to be crucial for the success of breastfeeding, since children who were born at term were more likely to maintain EBF when compared to those born prematurely (OR = 1.572). This finding is supported by other studies.[21,22] The determinant of not having difficulty breastfeeding was a protective factor at both times investigated. This determinant investigated nipple fissures, adequate breastfeeding technique, correct position and latch, among other problems identified by the mothers. Therefore, it is concluded that the mothers were successful in the care provided both during pregnancy and during the postpartum period. Studies have shown that counseling and guidance on breastfeeding are a strong strategy for promoting, protecting, and supporting breastfeeding.[9,22] In addition to the role of nursing in this care, being the main professional category that offers support and assistance to mothers at this time.[9]

Among the limitations of the study, we highlight the number of mothers who continued to respond to the telephone survey on the 27th day after delivery, even with all the strategies to reach these participants, which reduced the sample for the targeted monitoring and the lack of monitoring of the sample investigated until the sixth month of life of the babies, the period suggested for EBF. This was not possible due to problems in contacting the participants of the study, which took place during the COVID-19 pandemic.

Conclusion. The relationship between social determinants of health, such as marital status, maternal lifestyle habits, birth weight of the baby, and difficulties in breastfeeding, influences the practice of EBF. Understanding and comprehending the social determinants of health can favor greater adherence to EBF, in addition to contributing to greater knowledge and improvement of nursing practice in the context of breastfeeding.

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