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Investigación y Educación en

Enfermería

–Nursing Research and Education–

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Editorial

Nursing and its Essential Role in the Vaccination against COVID-19: New Challenge in a Pandemic Scenario

R. Mauricio Barría P.[1]
https://orcid.org/0000-0002-3764-5254

Descriptors: SARS-CoV-2; COVID-19; mass vaccination; vaccination refusal; nursing.

Descriptores: SARS-CoV-2; COVID-19; vacunación masiva; negativa a la vacunación; enfermería.

Descritores: SARS-CoV-2; COVID-19; vacinação em massa; recusa de vacinação; enfermagem.

To the date of publication of this editorial, we have gone through over 20 months of facing the complex and challenging SARS-CoV-2 pandemic since the first case was reported in late 2019. The consequences globally have been significant not only due to the unprecedented morbidity and mortality throughout the world, but also as effect of the drastic changes taking place in the usual dynamics in the individual, family, and collective settings, given the overall interruption of habitual functions and operations in the distinct contexts

1 RN, MSc, DrPH. Director of the Institute of Nursing, Faculty of Medicine, Universidad Austral de Chile. email: rbarria@uach.cl

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of daily life, sustaining only those activities considered essential.

Since then, varying non-pharmacological interventions and public health measures have been implemented aimed at stopping or slowing down the propagation of the virus during the first stages of the pandemic, including some controversial and others that have proven effective, like obligatory use of face masks, physical distancing and restrictions on mobility due to the establishment of quarantines and home confinement, travel restrictions, frontier closings, and intensive tests of trace and follow-up to contacts.[1]

Nevertheless, and as it has occurred with other infectious diseases, in spite of the measures described, requirement of a vaccine was seen as an urgent intervention to confront the pandemic advance. As has been the experience during other moments, the vaccination has contributed in large degree to global health being considered one of the most important accomplishments of science and medicine, given that together with mitigating the spread of infectious diseases, it reduces the economic impact in health systems.[2] Consequently, the rapid dissemination of the SARS-CoV-2 coronavirus obligated different laboratories throughout the world to develop vaccines at a fast race upon isolating the virus for the first time and sequencing its genome in early 2020. Efforts to develop a vaccine today account for studies in over 100 products, several of which have already been authorized by regulatory agencies.[3]

In this perspective based on the good results shown by some vaccines, it is that, as of early 2021, different countries, through their governments, began to negotiate and acquire these products to implement mass vaccination programs against COVID-19 to contain greater propagation of SARS-CoV-2 and, thus, allow return to the habitual activities of the community and society in general. However, the capacity of the vaccination program to control the disease, as with other vaccination programs, like that developed to confront influenza, will depends on its reach in the community and, in the case of the COVID-19 vaccine, it will be required to capture at least 80% of the population during the first year of vaccination.[4]

It is within this panorama that nurses globally have been fundamental in this new task, adding to the contribution they have already made not only by their incessant work in the front line, participating in the health teams that provide care to critical patients with COVID-19, but at different levels participating in information campaigns and control tasks to verify compliance with preventive contagion measures. From their positioning and recognition in the community and taking advantage of the direct contact they have daily with users and patients in the different settings in which they work, nursing professionals participate by educating the vaccine receptors to raise public awareness besides participating directly in their administration, a great task to achieve broad coverage in a short time. As has occurred with other vaccination plans and programs throughout the life cycle, primary and community care nurses are in charge of guaranteeing the manipulation, storage, and safe administration of the vaccines and have contributed to promoting the vaccination, helping to design and carry out efficient campaigns. Due to this, today they constitute a crucial factor for the success of mass vaccination programs against COVID-19.

What today is relatively clear is that, considering the satisfactory efficacy reported for different vaccines (> 80%) and, additionally, knowing that the protection is short, immunization is required of a large proportion of the population so that with this coverage there is some possibility of obtaining herd immunity to block continuous transmission of SARS-CoV-2.[4] Uncertainty is greater, given that it is recognized that the first-generation vaccines are effective to reduce serious disease due to SARS-CoV-2 and deaths due to COVID-19, but their full effectiveness has not been assured against emerging variants.

The new challenge in this pandemic scenario is to face the need to promote trust and acceptance of the vaccines within a context of misinformation and mistrust, given that – as a consequence of the speed of the investigation and production of new vaccines, many people are not only skeptical about their safety if not totally resistant to the idea of getting vaccinated. Due to this, beyond the complex task of implementing vaccine administration plans in different places, doubts about vaccines should be addressed and promote trust in them[5] because sufficient evidence exists that the success of a vaccination program depends on its coverage to achieve herd immunity, but it is equally clear that indecision or uncertainty regarding the vaccines has the potential to undermine such programs.[6,7] It must be highlighted that the COVID-19 vaccine continues being the most effective medium to achieve control of the pandemic and, likewise, people not vaccinated continue being at substantial risk of infection, serious disease, and death, especially in areas with high levels of SARS-CoV-2 community transmission.[8]

Given the indecision around vaccines, the creation of herd immunity through vaccination is likely to be a challenge in many countries and, consequently, communication and the resulting public awareness is likely the most crucial role played currently by nurses in the vaccination process. For such, primary and community care nurses must help in the promotion and acceptance of the vaccines through evidence-based interventions and assume a fundamental role in allowing adequate information to be transmitted and promoted in the adequate moment, in the adequate level, and in the adequate format.[5,6] In parallel and given the experience of the front-line nurses during the pandemic, they can communicate how the vaccine can mitigate the consequences of COVID-19 and, additionally, be an example for the population by getting vaccinated and to be able to model the behavior that others should adopt in the face of the possibility of contagion.

The COVID-19 pandemic has evidenced the need to demonstrate the timely, creative, and innovative response capacity of health staff and prominently nurses in clinical care and community contexts to face an international disaster that, until now, has lasted for almost two years and which has required different strategies, interventions, and perspectives. Nursing participation during this critical period has been expressed in the essential function in their clinical settings when providing patient care, reorganizing routines, spaces, and work teams to respond to the high demand. In other scenarios, they have supported the public health initiatives when participating in prevention and promotion actions, in screening for the disease, in the follow up of contacts, and in the control and surveillance of measures adopted by central and local governments, among other actions. But, currently, a responsibility and greater challenge is their leading role in mass vaccination plans against COVID-19 in which besides providing security in vaccine management processes regarding storage, distribution, and administration they must provide the necessary trust based on their credibility and position in the community, and employing the necessary communication tools to permit appropriate vaccination coverage that provides the required protection to the population.

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Original article

State and Evolution of the Investigación y Educación en Enfermería Journal from a Metric Analysis

Manuela Vélez Ramírez[1,4]
https://orcid.org/0000-0003-4187-1796

Jaider Ochoa Gutiérrez[2,4]
https://orcid.org/0000-0002-5492-3922

Marcela Suárez Tamayo[3,4]
https://orcid.org/0000-0003-2678-3421

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State and Evolution of the Investigación y Educación en Enfermería Journal from a Metric Analysis

Abstract

Objective. To analyze levels of production, reach, and thematic development of the *Investigación y Educación en Enfermería* journal from a scientometric analysis. **Methods.** The study collected 1,066 articles corresponding to the period between 1983 and 2020. The scientometric analysis was carried out from three components of descriptive analysis: performance of the publication, geographic reach, and thematic development. The first two used data consolidated from articles published in the *Open Journal System* at Universidad de Antioquia. The third component captured the bibliographic references from the *Web of Science* and *Scopus* databases and from the *Google Scholar* and *Lens* academic search engines. **Results.** In terms of the production analysis, the Journal shows stable behavior sustained over time

1 Sistema de Bibliotecas.
Email: manuela.velezr@udea.edu.co

2 Grupo de Investigación Información, Conocimiento y Sociedad. Escuela Interamericana de Bibliotecología. Email: jaider.ochoa@udea.edu.co

3 Grupo de Investigación Información, Conocimiento y Sociedad. Email: marsumayo@gmail.com

4 Universidad de Antioquia, Medellín (Colombia).

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with international reach regarding authorship. In the thematic setting, the Journal concentrates on two large clusters: 1) research on human factors from different perspectives and 2) cross-sectional studies differentiated mainly by sex. With respect to emerging clusters, on one side, a thematic pillar is seen with studies in young adult population and another in matters related to the educational process and nursing students. **Conclusion.** The Journal has maintained outstanding behavior in terms of production over time, aligned with very good visibility for potential authors internationally; something not easily accomplished for most journals in Colombia. Likewise, its production has had a thematic domain to a greater extent related to human factors associated with the nursing practice

Descriptors: bibliometrics; serial publications; scientific publication indicators.

Estado y evolución de la Revista Investigación y Educación en Enfermería a partir de un análisis métrico descriptivo

Resumen

Objetivo. Analizar los niveles de producción, alcance y desarrollo temático de la revista *Investigación y Educación en Enfermería* a partir de un análisis cienciométrico. **Métodos.** Se recopilaron 1066 artículos correspondientes al periodo 1983-2020. El análisis cienciométrico se desarrolló a partir de tres componentes de análisis descriptivo: desempeño de la publicación, alcance geográfico y desarrollo temático. Para los dos primeros se utilizaron los datos consolidados de los artículos publicados en el Sistema *Open Journal System* de la Universidad de Antioquia. Para el último, se capturaron las referencias bibliográficas de las bases de datos *Web of Science* y *Scopus*, y de los buscadores académicos *Google Scholary* y *Lens*. **Resultados.** En términos del análisis de la producción, la Revista muestra un comportamiento estable y sostenido en el tiempo con un alcance internacional en cuanto a la autoría. En el ámbito temático, se concentra en dos grandes clústeres: 1) la investigación sobre factores humanos desde diferentes perspectivas y, 2) estudios transversales diferenciados principalmente por sexo. En cuanto a los clústeres emergentes, por un lado, se ve un pilar temático con estudios en población adulta joven y otro en asuntos relacionados con el proceso educativo y los estudiantes de enfermería. **Conclusión.** La Revista ha mantenido un comportamiento destacado en términos de producción en el tiempo, alineado

con muy buena visibilidad para potenciales autores en el contexto internacional, lo que no es logro fácil para la mayoría de las revistas en Colombia. Asimismo, su producción ha tenido un dominio temático en mayor medida relacionado con los factores humanos asociados a la práctica de la enfermería.

Descriptores: bibliometría; publicaciones seriadas; indicadores de producción científica.

Situação e evolução da revista Pesquisa e Educação em Enfermagem a partir de uma análise métrica descritiva

Resumo

Objetivo. Analisar os níveis de produção, abrangência e desenvolvimento temático do periódico Nursing Research and Education a partir de uma análise cienciométrica. **Métodos.** Foram coletados 1066 artigos correspondentes ao período de 1983-2020. A análise cienciométrica foi desenvolvida a partir de três componentes da análise descritiva: desempenho da publicação, abrangência geográfica e desenvolvimento temático. Para os dois primeiros, foram utilizados os dados consolidados dos artigos publicados no *Open Journal System* da Universidade de Antioquia. Para este último, as referências bibliográficas foram capturadas nas bases de dados *Web of Science* e *Scopus*, e nos motores de busca acadêmicos *Google Scholar* e *Lens.* **Resultados.** Em termos de análise da produção, a Revista mostra um comportamento estável e sustentado ao longo do tempo com abrangência internacional em termos de autoria. Na área temática, a Revista concentra-se em dois grandes grupos: 1) pesquisa sobre fatores humanos a partir de diferentes perspectivas e, 2) estudos transversais diferenciados principalmente por sexo. No que diz respeito aos clusters emergentes, por um lado, existe um pilar temático com estudos na população adulta jovem e outro nas questões relacionadas com o processo educativo e discentes de enfermagem. **Conclusão.** A Revista tem mantido um desempenho notável em termos de produção ao longo do tempo, alinhado com uma visibilidade muito boa para potenciais autores a nível internacional; algo que não é fácil de conseguir para a maioria das revistas na Colômbia. Da mesma forma, sua produção teve um domínio temático em maior medida relacionado aos fatores humanos associados à prática de enfermagem.

Descritores: bibliometría; publicações seriadas; indicadores de produção científica.

Introduction

Within the environment of scientific communication, scientific journals constitute a means *par excellence* for the dissemination of knowledge product of research activity.[1] This means permits increasing the knowledge base of the fields and academic communities, becoming essential to devise mechanisms that facilitate measuring or evaluating their performance.[2] Metric analysis of production in scientific journals permits identifying signs in their behavior that can best guide their management.[3] Commonly, bibliometric and scientometric studies have been oriented by analyzing the impact factor as indicator *par excellence* for journals. However, with the rise of digitality and positioning of open access, these types of indicators have been heavily questioned and,[4,5] hence, new metrics are proposed that permit recognizing in greater detail the performance of the journals and a tool to strengthen editorial management.[4]

This article sought to analyze the production levels, reach, and thematic development of the *Investigación y Educación en Enfermería* (IEE) journal from a scientometric analysis.[6] This Journal is a scientific publication of the Faculty of Nursing at Universidad de Antioquia, focusing on support, development, and visibility of the Nursing discipline. It has a periodicity of three numbers per year and is indexed in the main information sources, like *Web of Science*, *Scopus* and *PubMed Central*. The observation window concentrates on analyzing the production, its reach, most-cited articles, and the thematic domain the publication has had. This required analysis of 1 066 articles corresponding to the journal's history, specifically, to the period comprised between 1983 and 2020.

This called for the consolidation of the database of articles from the Journal, which is available in the *Open Journal System* software managed by the University. To analyze the thematic domain, data of articles indexed in *Web of Science*, *Scopus*, Lens and *Google Scholar* was used. The results presented permit elucidating a general state of the Journal; seeing the behavior of the production over time, by authors, institutions, and countries; identifying articles with the best citation indexes; besides providing a panorama of the themes of greater relevance that have been worked in the articles published. This seeks to be a first systematization effort that offers a panorama based on data to support strengthening editorial management processes.

Overall, the Journal shows stable behavior sustained over time with international reach regarding authorship. In the thematic setting, this publication concentrates on two large clusters of themes corresponding, initially, to research on human factors and then to cross-sectional studies to analyze risk factors, health status or behavior differentiated by sex. The

Journal has maintained outstanding behavior in terms of production over time and with very good visibility for potential authors internationally; something not easily accomplished for most journals in the country. Likewise, its production has had a thematic domain to a greater extent related to human factors associated with the nursing practice.

Methods

This study reviews 1,066 articles from the *IEE* journal, since the publication of its first number in 1983 until June 2021. The aim was to see the patterns of publication, collaboration by authors, geographic reach, and thematic development from the scientometric analysis[1–3,6,7] and social network analysis.[8–11] Recovery of articles was conducted through the Open Journal System (OJS) at Universidad de Antioquia. After obtaining a preliminary list, revision was made of each of the metadata, seeking to eliminate repeated registries and identifying missing information.

The data systematized from each of the articles were title, full name of each author, institutional affiliation of each, country of origin of each institution, key words, and year of publication. The OJS yielded automatically all the data, except for the institutional affiliation of each of the authors and country of origin; these were filled out manually. Upon obtaining all the data, the work proceeded with standardization, emphasizing on the authors, institutions, and countries.

Regarding information on the citation and thematic relation, the data were captured from *Web of Science*, *Scopus*, Lens, and *Google Scholar*. This permitted obtaining a general panorama of the state of the Journal in scientific information sources. To analyze and visualize the data, the *Power BI* and *Tableau* applications were used; for the visualization of networks of co-authorship and co-occurrence of words, *VOS Viewer* was used.

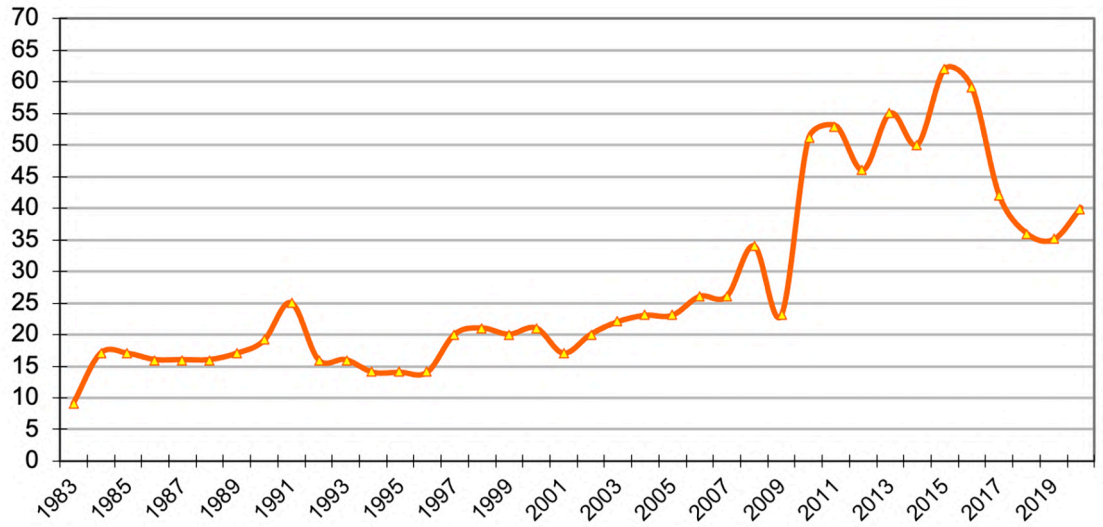
Analysis instruments. This study answers three fundamental questions: (i) *what has been the performance in terms of productivity of the IEE journal since its first publication until now?* This journal has been in uninterrupted publication for almost 40 years, which speaks for itself of a hard-won solidity. With systematized data of the number of articles, number of authors and institutions, year-to-year, its evolution will be demonstrated. This type of information permits the Journal's directives to review significant changes in editorial policies and subsequent analysis of how these have affected the production of articles and their impact. (ii) *What has been the Journal's geographic reach regarding scientific production and how have the dynamics of collaboration between authors and institutions come about?* The capture of institutional affiliations and countries of origin of each of the authors permit observing the origin of the articles published and the collaboration dynamics among authors and, hence, institutions. (iii) *What are the main thematic axes the Journal has had?* By using the methodology of social network analysis and the *VOSViewer* software,[8] the construction of word co-occurrence analysis networks is carried out; that is, identify the joint occurrences of two terms in a text to determine the thematic domain.[11] This specific case used the Lens indexing base, with > 900 articles, which captures the terms under the MeSH organization scheme, of great use being that it is a controlled vocabulary focused on health sciences. Networks permit visualizing the clusters or thematic blocks that permit recognizing the Journal's domain.

Results

The following presents the principal's descriptive results of the IEE journal. Initially, activity or production indicators are described, then the reach and co-authorship, and – lastly – the thematic analysis.

What has been the behavior of the Journal's publication of articles over time?

As observed in Graphic 1, the Journal has had stable behavior in recent years in the production of articles. It is striking that at no time has publication been stopped and, therefore, the Journal's positioning has not been affected. During the last decade, growth in publications is notable due to the increase of a third number per year. However, although there is a decrease in the number of articles published in the last four years, this does not indicate difficulties in the editorial management process; on the contrary, it may be related with the reduction of articles per number for greater quality control and, thereby, a higher rejection rate for manuscripts received. This could be interpreted in terms of maturity and exigency of the editorial policies.



Graphic 1. Frequency of articles published from 1983 to 2020 in the IEE Journal

What are the principal institutional affiliations of the authors who published in the Journal?

Table 1 shows the 18 most-frequent institutions related with the authors who publish in the Journal, with the first being Universidad de Antioquia, an expected condition, considering its shared origin. However, it is striking that, in order of production, international institutions appear above others from the national order. It can be seen in the case of Brazilian universities, like Universidade Federal do Rio Grande do Sul, with 94 articles and Universidade de São Paulo, with 92 articles. Likewise, other institutions, like Shiraz University of Medical Sciences, from Iran with 73 affiliations; and, lastly, Pontificia Universidad Católica in Chile with 72 affiliations identified. This could be interpreted in terms of the reach and the interest the Journal generates internationally and not only at the local and national levels.

Table 1. Frequency of articles by institutional affiliation of the authors

Institution	Frequency
Universidad de Antioquia	723
Universidade Federal do Rio Grande do Sul	94
Universidade de São Paulo	94
Schiraz University of Medical Science	73
Pontificia Universidad Católica de Chile	72
Universidad Nacional de Colombia	64
Universidad Autónoma de Nueva León	37
Universidade Federal de Ceará	35
Universidade Estadual Paulista	34
Universidade Federal de Santa Catarina	34
Universidad del Valle	49
Universidade Federal São João del Rei	29
Universidad Federal do Rio Grande do Sul	28
Universidad de Cartagena	24
Universidade Federal de Paraná	24
Universidade do Estado do Rio de Janeiro	24
Universidade Estadual de Maringá	23

What are the principal nationalities related with the authors who publish in the Journal?

In relation to the authors' origins, as shown in Figure 1, most publications have been from authors of Colombian nationality, followed by Brazilians, Mexicans, and Chileans; this could be translated into good regional visibility at Latin American level. Nevertheless, also striking is the number of authors from the European block, mainly Spain and Portugal; and from the Asian continent, especially from Iran and India. These data could be read as greater reach of visibility and interest in the Journal's publication, which agrees with the analysis of institutional affiliation.

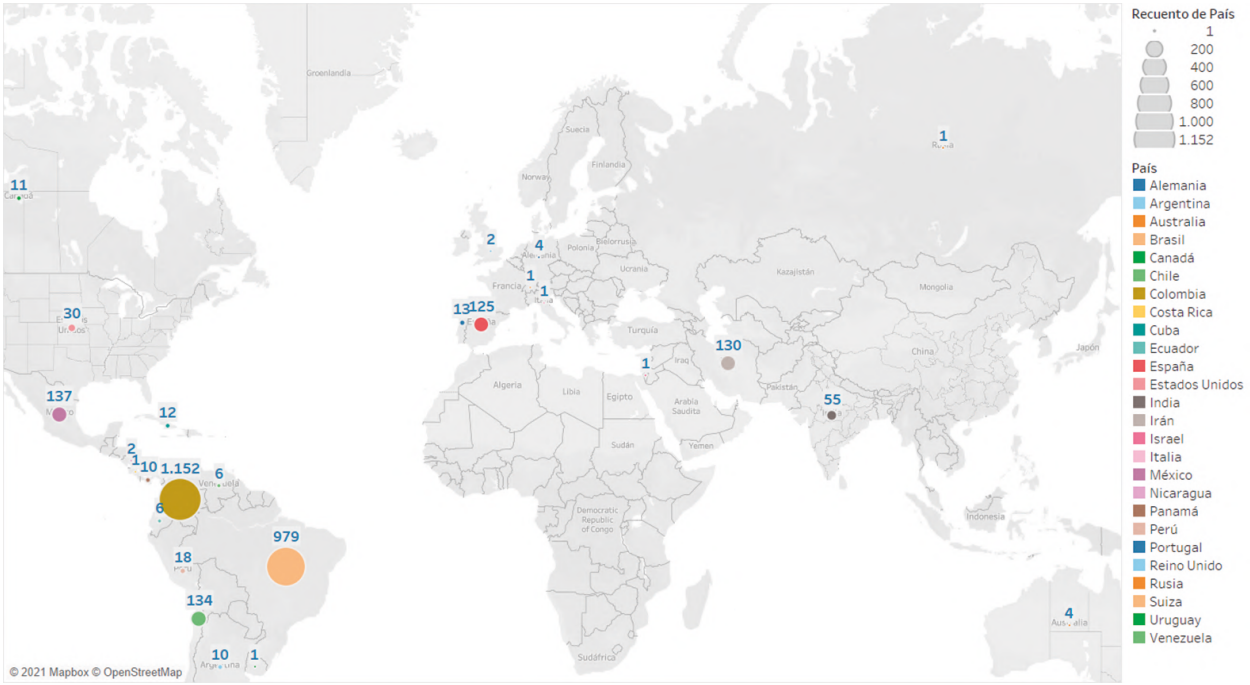


Figure 1. Frequency of the undersigning authors of the articles according to country

What are the principal themes addressed in the Journal?

The thematic analysis by co-occurrence of words permits seeing the relations and closeness among terms worked in the Journal's articles. This specific case used MeSH terms, which are typical of the specialized language of the health field and have a standardization process. In this case, this type of analysis of social networks provides a panorama of the Journal's thematic domain, identifying which are the concepts most worked and how those relations are perceived as thematic clusters. This, on the matter of editorial management, permits the Journal to analyze its thematic strengths and, from there, guide policies, seek and motivate authors on the theme, and plan numbers of greater degree of specialization.

In general, the Journal concentrates on two large thematic clusters (Figure 2) and another two emerging or complementary. A first cluster related with studies of human factors from different perspectives and the second corresponding to cross-sectional studies mainly differentiated by sex. Regarding the emerging clusters, on one side, thematic pillar is seen related with studies on young adult population and on the other, on issues related with the educational process and nursing students. The following analyzes each thematic cluster.

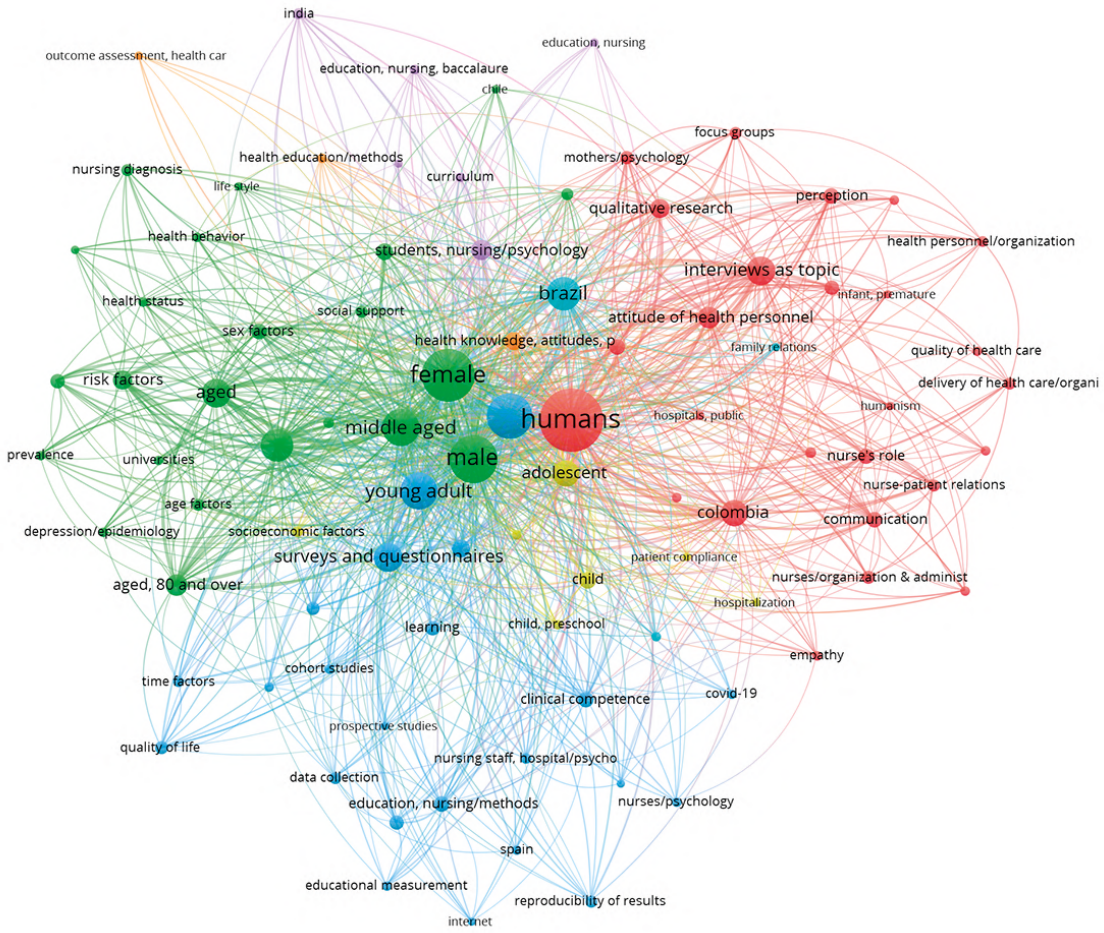


Figure 2. Principal themes developed in the Journal's articles

Specifically, the thematic cluster can be seen, corresponding to the term Humans; the size of the node shows the importance and recurrence of this concept in the Journal's publications. The term presents a co-occurrence link with terms, such as qualitative research and analysis techniques associated with this type of research; this supposes that an interesting number of articles use this type of methodology. The relationship can also be seen of this concept with studies on the profile and role of nurses, showing permanent concern of the field for this topic of analysis. Evidence exists of studies that, within this framework, work the patient-nurse relation, communication, and some values with relation to humanism. In transversal manner, it could be understood that multiple related studies have focused on Colombia, which is consistent with the origin of the largest number of authors the Journal has had.

The second most relevant cluster shows a thematic development related to cross-sectional studies associated with gender factors. According to other terms associated, these studies could focus on analyzing risk factors, health status or in men and women. Likewise, a node of interest is shown

related to the concept of adult. This term can be linked to others, such as young adults, surveys, and questionnaires; this could be associated with multiple studies that focus on applying these instruments to the knowledge of health factors in this population. In turn, other relationships can be seen with quality of life, psychological factors, and family. In addition, the relationship between terms associated with COVID-19 studies and educational resources is also noteworthy. From this cluster, a small emerging cluster can be seen referring to the terms adolescents, children, and hospitalization. This could be interpreted with relation to the term adult, such as the existence of articles that analyze by age groups.

Lastly, an emerging cluster may be seen with a principal node related with the term nursing students. Upon seeing the relations available, interesting terms appear, like education and curriculum, a trend that could be taken as interest of the publications for the educational process of nurses and for the lives of university students. Network analysis of co-occurrence of words permitted identifying the Journal's thematic dimension, seeing which themes are of greater focus or interest and, therefore, an analysis framework that allows promoting editorial strategies to support the consolidation of topics. This exercise is shown as an interesting field of work to continue potentiating from the Journal's direction and, in that sense, make decisions that support enhancing the editorial management.

Discussion

This section is structured by thinking more on taking advantage of the data results, to provide some ideas to keep in mind when managing the Journal, hence, what will be seen ahead focuses on taking some of those elements to make proposals. It is important, from the start, to recognize the trajectory of the IEE Journal, which can not only be seen as a reference in its field for the University but also for the country and the region. It is significant to consider this, bearing in mind the difficulties endured by many journals for their sustainability over time and, above all, for their indexing in important sources, like *Scopus*, *Web of Science* and *PubMed Central*.

The production behavior shows a very stable Journal, with a production that has been maintained over time, not only to boost research from the University but, also, from multiple latitudes. Analyses demonstrate sustained production, principally by authors from Universidad de Antioquia, but much attention is drawn to international visibility where it is possible to see researchers from Brazil, Chile, Mexico, Spain, Portugal, Iran, and India. Considering the foregoing, it is imperative to continue thinking of diverse visibility strategies in different channels, continue motivating researchers from multiple places to publish and evaluate works, participate actively in scientific networks and networks of journals; sustain presence in the main indexing systems and diversify ways of communicating the publication.

In addition, it is suggested for the Journal to design digital marketing strategies that allows it to gain greater presence in social networks, in general networks, like *Facebook*, *Twitter, and Linked-in,* as well as in specialized networks, like *Research Gate*. This implies, for example, insisting on the design of new ways of communicating the publication and characterizing the audiences that may be interested in the contents of the Journal.

Within the thematic setting, the results evidence a variety of important themes for publication. It is important to continue conducting these types of exercises, considering the possibility of promoting numbers focused on thematic pillars. Likewise, being able to identify authors with those domains to motivate them to publish; in addition to crossing the thematic analysis with identifying or characterizing the citation, given that it could account for which themes are stronger and of

greater interest for the academic community. In turn, it is worth to relate with co-authorship analysis to identify the Journal's momentum in building a scientific community.

Digital curation is necessary or constant revision of the metadata available in the OJS. When executing this project, problems emerged with the normalization of authors and data on institutional affiliation; for this, it is essential to work hand in hand with the Journals System team at Universidad de Antioquia to, thus, constantly verify the quality of the information. It is also important to monitor indexing systems, given that problems could exist with the information indexed therein or, even, loss of visibility and citations could occur.

These types of exercises support, under the focus of data and evidence management, the strengthening of editorial management. In this sense, it is important to continue with a line of work that supports performing new analyses and constructing metrics.

Due to such, future exploration is proposed of the type of citation, that is, characterize the types of citations the Journal has; this will permit knowing which can be the greatest strength in terms of impact, like, for example, if the Journal is taken as reference for formative processes, to support new research, or for other types of documents that require the base it offers.

Lastly, just as it has insisted on designing strategies for visibility in social networks, it is also important to boost the monitoring and development of metrics in these channels, given that, although evidence exists in the literature that shows the importance of these types of indicators for visibility and citation, each publication has its peculiarities to keep in mind to enhance said processes. In this sense, if Altmetric indicators are systematically designed [12–14] for the Journal, this could help to define new strategies that help the publication's that support the publication's editorial management.

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Original article

‘Unheard voices’: Perceptions of women with mental illness on nurses screening routinely for domestic violence: A qualitative analysis

Vijayalakshmi Poreddi[1,6]
https://orcid.org/0000-0002-1529-908X

S. Sai Nikhil Reddy[2]
https://orcid.org/0000-0002-0431-6868

Sailaxmi Gandhi [3,6]
https://orcid.org/0000-0002-2414-0003

Marimuthu P[4,6]
https://orcid.org/0000-0002-0029-3216

Suresh BadaMath[5,6]
https://orcid.org/0000-0001-8190-0382

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‘Unheard voices’: Perceptions of women with mental illness on nurses screening routinely for domestic violence. A qualitative analysis

Abstract

Objective. To explore women’s experiences of violence and their opinion on routine screening for domestic violence by nursing professionals in mental health care settings. **Methods.** This qualitative narrative research design was carried out among 20 asymptomatic women with mental illness at a tertiary care centre in Bangalore, India. **Results.** Narrative content analysis was performed, and five dominant themes have emerged: 1. Understanding the nature and signs of violence (subtheme: Meaning of violence), 2. Abusive experiences of women with mental illness (subthemes: Physical violence, psychological violence, social violence, sexual violence and financial violence), 3. Experiences on disclosure of violence (subthemes: Identification of violence by nursing professionals, Experiences of disclosure of violence),

1 Ph.D. Clinical instructor, College of Nursing. Email: pvijayalakshmireddy@gmail.com. Corresponding author

2 MBBS. Bangalore Medical College and Research Institute, Bangalore, India. Email: saithereddy@gmail.com

3 Ph.D. Professor, Department of Nursing. Email: sailaxmi63@yahoo.com

4 Ph.D. Professor, Department of Bio-statistics. Email: p_marimuthu@hotmail.com

5 MD in Psychiatry, Professor, Department of Psychiatry. Email: nimhans@gmail.com

6 National Institute of Mental Health and Neuro Sciences, (Institute of National Importance), Bangalore, India.

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4. Barriers for disclosure of abuse(subthemes: Fear of consequences, the hectic schedule of nursing staff, helplessness and hopelessness, perceived poor family support). 5.Routine screening for violence by nursing professionals (subthemes: reasons for routine inquiry of violence, nature of inquiry by the nursing professionals). **Conclusion.** Women with mental illness were undergoing more than one form of violence, and most of the participants supported routine screening by nursing professionals. Nurses play an essential role in identifying and supporting abused women in mental health care settings**.**

Descriptors: battered women; mental disorders; physical abuse; qualitative research.

"Voces no escuchadas": Percepciones de las mujeres con enfermedades mentales sobre el cribado rutinario de la violencia doméstica por parte de las enfermeras. Un análisis cualitativo

Resumen

Objetivo. Explorar las experiencias de violencia que sufren las mujeres y su opinión sobre el cribado rutinario de la violencia doméstica por parte de los profesionales de enfermería en los centros de salud mental. **Métodos.** Esta investigación narrativa cualitativa se llevó a cabo con 20 mujeres asintomáticas con enfermedades mentales en un centro de atención terciaria en Bangalore, India. **Resultados.** Se realizó un análisis de contenido narrativo y surgieron cinco temas dominantes: 1. Comprensión de la naturaleza y los signos de la violencia (subtema: Significado de la violencia), 2. Experiencias abusivas de las mujeres con enfermedades mentales (subtemas: Violencia física, violencia psicológica, violencia social, violencia sexual y violencia económica), 3. Experiencias sobre la revelación de la violencia (subtemas: Identificación de la violencia por parte de los profesionales de enfermería, Experiencias de revelación de la violencia), 4. Barreras para la revelación del abuso (subtemas: Miedo a las consecuencias, el agitado horario del personal de enfermería, impotencia y desesperanza, percepción de un escaso apoyo familiar). 5. Indagación rutinaria de la violencia por parte de los profesionales de enfermería (subtemas: razones para la indagación rutinaria de la violencia, naturaleza de la indagación por parte de los profesionales de enfermería). **Conclusión.** Las mujeres con enfermedades mentales sufrieron más de una forma de violencia y la mayoría

de las participantes apoyó el cribado rutinario por parte de los profesionales de enfermería. Las enfermeras desempeñan un papel esencial en la identificación y en el apoyo a las mujeres maltratadas en los entornos de atención en la salud mental.

Descriptores: mujeres maltratadas; trastornos mentales; abuso físico; investigación cualitativa.

"Vozes não ouvidas": percepções de mulheres com transtorno mental sobre o rastreamento cotidiano da violência doméstica por enfermeiras. Uma análise qualitativa

Resumo

Objetivo. Explorar as experiências de violência sofrida por mulheres e sua opinião sobre o rastreamento rotineiro de violência doméstica por profissionais de enfermagem em centros de saúde mental. **Métodos.** Esta pesquisa narrativa qualitativa foi realizada com 20 mulheres assintomáticas com doença mental em um estabelecimento de cuidados terciários em Bangalore, Índia. **Resultados.** Realizou-se uma análise de conteúdo narrativo e emergiram cinco temas dominantes: 1. Compreendendo a natureza e os sinais da violência (subtópico: Significado da violência), 2. Experiências abusivas de mulheres com transtorno mental (subtópicos: Violência física, violência psicológica, violência social, violência sexual e violência econômica), 3. Experiências sobre a divulgação da violência (subtópicos: Identificação da violência por profissionais de enfermagem, Experiências da divulgação da violência), 4. Barreiras para a divulgação do abuso (subtópicos: medo das consequências, enfermagem ocupada horas de trabalho, desamparo e desesperança, percepção de pouco apoio familiar) 5. Inquérito de rotina sobre violência por profissionais de enfermagem (subtópicos: motivos de inquérito de rotina sobre violência, natureza do inquérito por profissionais de enfermagem). **Conclusão.** Mulheres com doença mental sofreram mais de uma forma de violência e a maioria das participantes apoiava o rastreamento de rotina pelos profissionais de enfermagem. Os enfermeiros desempenham um papel essencial na identificação e apoio às mulheres agredidas em ambientes de cuidados de saúde mental.

Descritores: mulheres maltratadas; transtornos mentais; abuso físico; pesquisa qualitativa.

Introduction

Violence against women is a global public health issue. Violence among women is defined as "an act of gender-based violence that results in physical, sexual, or psychological harm to women including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life".[1] According to the National Family Health Survey (NFHS-4, 2015-16), 27 percent of women have experienced physical violence since the age of 15 in India.[2] A systematic review showed that 41% of Indian women experienced domestic violence (at least two forms of abuse) during their lifetime and 30% in the past year.[3]

International studies have established a clear association between violence against women and poor mental health.[4] Furthermore, systematic reviews have reported that people with mental illness are at increased risk for violence[5,6] than the general population.[7] The lifetime prevalence of domestic violence among psychiatric in-patients ranged from 30% to 60%, with a higher prevalence in women compared to men. Further, a recent nationwide survey from the UK found that around one in five women with severe mental illness (SMI) experienced domestic violence, and one in ten women (and 3% of men) with SMI experienced sexual violence.[8] However, their contact with mental health services provides a window of opportunity for mental health professionals to identify and provide appropriate interventions. In India, women who had experienced domestic violence were more likely to report poor mental health and suicidal tendencies compared to women who had not experienced violence.

World Health Organization recognized violence against women as a health priority and declared on strengthening the role of the health system in addressing violence against women.[9] While people with mental illness are at greater risk for victimization,[10] often goes unnoticed by mental health professionals. There has been limited research that explored views of women with mental illness on an understanding of abuse, barriers to disclosure of violence and opinion on routine enquiry by mental health professionals.[11] A handful of Indian studies have examined the prevalence of violence among persons with mental illness[12] and very few qualitative studies have explored violence among women with mental illness.[13] Qualitative research is an appropriate approach in exploring the abusive experiences of women with mental illness because of the complex nature of the mental illness. The present study aimed to explore experiences of violence among women with mental illness and their opinion on routine screening for domestic violence by nursing professionals in mental health care settings.

Methods

Research setting and participants

This study involves a qualitative research method using narrative inquiry to understand women with mental illness views about the routine enquiry by the nursing professionals about domestic violence at a tertiary care centre, Bangalore, India. The study criteria include female psychiatric patients who were asymptomatic (preferably before discharge) and have a history of domestic violence experience. Symptomatic and intellectually disabled patients were excluded from this study. The primary author approached the concerned resident doctor to discuss the severity of the symptoms and gone through the case files to confirm abusive experiences among the participants. The participants were recruited purposively to ensure diversity regarding age, diagnosis, religion, marital status, background, number of hospitalizations, and diagnosis. We determined that theoretical saturation was achieved after 20 interviews (out of a total of 24) as analysis of the four subsequent interviews did not generate any further leads. The mean age of the participants was 30.17 years (range 22-45, SD, 6.30). Sixteen were Hindus, three were Christian and one participant belonged to the Muslim religion. More participants were from rural backgrounds ($n=14$), and six were from an urban background. Only two of the participants were employed, while a majority were homemakers ($n=18$). The diagnoses of the participants as follows; depression ($n=9$), Schizophrenia ($n=4$), BPAD ($n=5$), psychosis($n=2$). Most of the participants were hospitalized for the first time (n=14), married (n=16), and had children. However, three of the participants were deserted by their husbands.

This study used a modified Interview guide (11 semi-structured questions) initially developed by Rose et al. (2011).[14] The researchers obtained the necessary permission from the authors to adapt and make modifications to meet the objectives of the present study. The following are examples of questions asked in interviews: 'Can you describe the kind of violence you are experiencing by family members" "Have you ever been asked about abuse by nursing professionals? if yes, what was your experience of this? How did it make you feel? Nature of the enquiry, 'Do you think that nurses should ask all clients about abuse? If not, why not? If yes, why? Do you think nurses should ask women with mental illness if they have ever been abused?

The modified interview guide was given to mental health experts from various departments (Psychiatric Nursing, Psychiatry, Psychiatric Social work, Clinical Psychology and Biostatistics) and incorporated the suggestions given by the experts. The finalized interview guide was piloted among five female psychiatric inpatients and found it was feasible to adapt to Indian settings. Since the participants were the vulnerable group, the primary author met concerned nurses and requested them to enquire about their willingness to participate in the study. Then the researcher met the potential participants, briefly explained the study's aims and objectives, and obtained the written informed consent. After developing a good rapport, the primary author individually interviewed the participants in interview rooms at psychiatry units. The interviews were conducted between January and May 2017. Each interview took approximately 45 minutes to 60 minutes which were then audiotaped and transcribed verbatim.

Ethical considerations

The study received ethical approval from the Institute Ethical Committee (NIMH/DO/IEC (BEH. Sc. DIV)/2016). After explaining the aims and objectives of the study briefly, the participants provided written informed consent for their participation and audio recording. Though we have included asymptomatic patients in this study, the authors consulted the treating doctors and obtained their approval to conduct the interviews

since the participants were the vulnerable group. They were also informed that they were given the freedom to withdraw from the study at any point of time without giving any reason. The researchers have maintained anonymity and confidentiality as they conducted the interviews in a private room in the hospital, and participants were given code numbers for analysis purposes. Also, the researchers removed the participant names and other personal identifiers from the transcripts. However, the interviews conducted by the primary author (PV) 'who said what' was not divulged. The researcher is the only person aware of the codes and did not share the information with anyone, including the research supervisor. Brief counselling was provided by the primary author (PV) if any significant distress occurs among the participants during the interview and offered appropriate guidance.

Data analysis

Data analysis involved thematic analysis and was conducted concurrently with data collection. The data analysis and coding procedures followed the six steps suggested by Creswell.[15] The first step was the collection of descriptions based on the patients' experiences. In the second step, the primary author (PV) converted the verbatim transcription of the interviews (regional languages) into English text, and the supervisors (SG, SBM) randomly checked transcriptions for accuracy. This step also included rereading the transcribed text to gain a general understanding. In the third step, preliminary codes were developed after reading the transcripts for several times. However, the coding scheme was modified as new interviews were coded. Codes were organized using Atlas ti software (version 7.5.10). the researchers categorized the related concepts. In the fourth step, the organized concepts were described and examined in more detail. Codes were built into broader categories through constant comparison and provisional themes were developed. The researcher interlaced emergent themes from the participants' responses into a brief description in the fifth step. The final step included the interpretation of data.

Rigor

The data was validated using the Lincoln and Cuba criteria (credibility, transferability, dependability, and confirmability). The participants were requested to offer their feedback on transcripts for the accuracy of the paraphrasing, and one participant provided comments and corrections. The credibility of coding is maintained by involving two researchers (PV& SNR) to code the same transcript individually and then discuss any similarities and differences in the resulting sets of codes supervised by the research guides (SG, MP). For transferability, the researchers used thick descriptions to describe the experiences of the participants with maximum variation. Two qualitative research experts checked the emerged themes and subthemes for dependability and confirmability.

Results

The data was saturated with a purposive sample of 20 female psychiatric patients. Findings are presented in response to the questions. In this study, five themes and fourteen subthemes have emerged (Table 1).

Table 1. Derived Themes and subthemes

Themes	Subthemes
1. Understanding the nature and signs of violence	1. Meaning of violence
2. Abusive experiences of women with mental illness	1. Physical violence 2. Psychological violence 3. Social violence 4. Sexual violence 5. Financial violence
3. Women's' experiences on disclosure of violence	1. Identification of violence by nursing professionals 2. Experiences of disclosure of violence
4. Barriers for disclosure of violence	1. Fear of consequences 2. Hectic schedule of nursing staff 3. Helplessness and hopelessness 4. Perceived poor family support.
5. Women's views on routine screening for violence by nursing professionals	1. Reasons for routine inquiry of violence 2. Nature of inquiry by the nursing professionals

Theme 1. Understanding the nature and signs of violence

The researchers in this study explored the participants' understanding of the nature and signs of violence.

Subtheme1. Meaning of violence. In this study, all the participants were aware of the meaning and types of violence, such as physical violence, sexual violence, and psychological violence. However, few of them were unaware of social and financial violence. Few of the responses from the participants include: *I think violence means …. Beating …. Pushing the women in an inhuman way (X5); Behaving differently to entrap women and torturing them (X6); Violence usually occurs by men to the women … I mean making her cry… (X8); Scolding women for simple things…. Purposefully making her cry (X9).*

Theme 2. Abusive experiences of women with mental illness

Most of the participants agreed that they were the victims of physical, psychological, and sexual violence. While they were not aware of financial and social violence, they could reveal their experiences after probing.

Subtheme 1. Physical violence. In this study, all the participants expressed that they have experienced physical violence by family members. A few participants said that their family members also threatened to admit them to the psychiatric hospital as they burden the family. Few of the narratives include: *See this scar… I had an injury when my husband pushed me against the wall…. He says I am useless…. If I irritate him, he will put me in the hospital…. (X3); My brother hit me in the bus stand ….in front of everybody… I felt very sad… I reported to my mother … she too supported my brother. She treats me low … even before I have developed this illness… she controls me. She doesn't give me money… I have to eat whatever is left over after my brother having…. Both of them say that I am good for nothing … (X4).*

Subtheme 2. Psychological violence. Similar to physical violence, all the participants stated that they had undergone psychological violence. Further, they expressed that physical scar can be disappear gradually, but the psychological trauma makes them feel isolated and sad. Few of the participants thought that they were treated differently by their family members. Two of the participants revealed that their husbands remarried without divorcing

them. But unfortunately, their husbands were supported by the family members. Examples of psychological violence include: *Yes, my family members treat me differently.... They show anger unnecessarily... (X1); My husband left me at my parents' home after I have developed this illness... he married again with my cousin.... My parents also supported this.... I felt very hurt... what is my fault..... (X5).* While it is important to consider the fact that the types of violence are interrelated, as the same individual undergoes physical and psychological violence..... As one of the participants expressed that Physical injuries can heal ...but the psychological hurt .... And those feelings are still raw in my mind as I have undergone abortion because my husband pushed when I was five months pregnant and never conceived again.... (X8).

Subtheme 3. Social violence. Most of the participants in this study were aware of social violence as they expressed that they were not allowed to attend family gatherings and continue their education. One of the participants said that their family members are forcing her to marry her uncle. Few narratives of social violence include: *My husband not taking me out even for my relatives' functions... he says I look like pig... he also says he is ashamed of me... I don't know how to behave.... (X4); My family members stopped me going to college... they say I cannot achieve anything... they are forcing me to get married to my uncle... I don't like him... he misbehaved with me..... (X2).*

Subtheme 4. Sexual violence. Few of the participants in this study have expressed that they experienced sexual violence by family members. One of the participants clearly explained the impact of sexual violence on her and her sister as they got admitted to the psychiatric hospital. Her story reflects the way few men take advantage of helplessness in women: *My husband is an alcoholic... my sister stays with me... because our parents passed away five years back... My sister was alone at home, and my paternal uncle raped her.... After that incident, my sister was admitted to a psychiatric hospital with severe depression... After discharge, I have taken her to my house.... two weeks back .... Again, she was sexually abused by my husband.... When I questioned him ... he says that he has done good ...for her. She will improve now. After this incident, my sister attempted suicide, and I readmitted her.... Doctors said that I too need treatment, and now I am on medication... I have two small children at home... I don't feel like to go home and to stay with him..... (X8).*

Subtheme 5. Financial violence. After probing, a few of the participants revealed to their experiences of violence related financial matters. They also felt that psychological and physical violence traumatize them more than financial violence. Few examples of financial violence include; *My husband doesn't involve me in any financial matters.... I am the one who used to manage the home...now my husband believes his mother.... I feel sad ... (X6).* All the participants agreed that they are experiencing various types of violence, making them feel sad, helpless, and need someone to understand them. The above illustrations provide a piece of clear evidence that most of the participants are experiencing more than one type of abuse.

Theme 3. Women's' experiences on disclosure of violence

The participants reported their experiences of nurses identifying violence and their responses to the disclosure of violence experiences.

Subtheme 1. Identification of violence by nursing professionals. All the participants in this study felt that nurses are friendly and approachable. Yet, nurses did not inquire them about violent experiences during their stay in the hospital or during the discharge. Few of the participants expressed that they were enquired about violence experiences when they see physical scars on their bodies and if they were moody and any changes in their behaviours such as not participating in the unit activities or refusing to take medicines

or changes in eating or sleeping. Few of the narratives include: *Yes, I remember... One of the sisters asked me when she has seen this scar.... (X3); Yeah.... all the sisters are nice....Friendly... but none of them asked about abuse (X5); No one asked me about this .... I tried telling them but ... I felt ... they won't believe me (X8).*

Subtheme 2. Experiences of disclosure of violence to the nursing professionals

Few of the participants stated that they have disclosed their experiences of violence with the nursing professionals and felt a feeling of relief. Few of the participants said they wanted to reveal their incidents of violence, but the nurses were either not interested in listening or didn't respond: *My brother and my mother hit me in the ward and front of nurses.... No one interfered.... Later, the sister came and counselled my mother.... (X6); One of the nurses asked me since I did not have food .... She asked me about this... I have told all of my problems.... I felt relieved... (X7).* While most of the participants expressed that disclosing violence to the nurses helped them in ventilating feelings, two participants felt that it may not help them improve their situation so they didn't disclose to the nurses.

Theme 4. Barriers for disclosure of violence

Participants in this study were encouraged to express the reasons for not disclosing abusive experiences with health care professionals. This main theme consisted of four subthemes: fear of consequences, hectic schedule of nursing staff, helplessness and hopelessness and perceived poor family support.

Subtheme 1. Fear of consequences. The majority of the participants wanted to disclose their experiences of violence with nurses. However, they had a fear that revealing of violence by their family members may be amplified. Few participants said they were worried that nurses might not believe their words or make fun of them. Few of the narratives include: *I feel like expressing about my husband's behaviour ... but I am terrified ... I don't have any support... (X12); I felt bad... when I tried to disclose my experiences, the sister said all that because of my mental illness...They may make fun of me after listening to my experiences (X2); Nurses may reveal this to my husband because he may throw me out of the house (X4).*

Subtheme 2. The hectic schedule of Nursing staff. Few of the participants expressed that they wanted to share their violence experiences with the nursing professionals. But they did not disclose as nurses were very busy with their routine work: *I tried expressing with one of the nurses.... She said that she is swamped... (X14); To be frank ,I have disclosed my experiences... but the nursing staff did not respond and said that she will would talk to me later... (X9).*

Subtheme 3. Helplessness and hopelessness. Very few of the participants felt that disclosing their abusive experiences with nursing professionals may not help them find the solutions. One of the participants stated the following: *I don't want to tell anyone because no one can help me..... (X15).*

Subtheme 4. Perceived poor family support. The majority of the participants believed that disclosing self-experiences of violence might impact their relationships with the family members. The family members do not support them in expressing their difficulties with health care professionals. Further, they require family members help in follow-up care and in meeting their basic needs. Few of the narratives include: *I am worried .... My husband may not accompany me to the hospital for the follow-up... he may not buy medications for me... (X12).*

Theme 5. Women's views on routine screening for violence by nursing professionals

Participants were encouraged to express their expectations from nurses when they enquire about

sensitive issues such as violence experiences. This central them consisted of two sub themes: reasons for routine inquiry of violence and nature of inquiry by the nursing professionals.

Subtheme 1. Reasons for routine inquiry of violence by the nursing professionals. All participants in this study felt that nurses are friendly, approachable, accessible at all times, and support them in finding solutions for their problems. Below given are few reasons endorsed by the participants. Most participants opined that they are comfortable disclosing their abusive experiences with the nurses as they are the most trusted individuals. However, most of them felt that routine inquiry by nurses helps them disclose violence experiences without any discrimination. Few of the narratives include: *Nurses are friendly, and I have no fear that they may reveal to family members... by expressing with them, I feel a bit relaxed (X10); Nurses may find the solutions... they may help us .... (X12); Unless nurses ask about violence, many of us are not aware whether we can ventilate about our abusive experiences or not ... (X2); Nurses may speak to elders in our family to find solutions to stop violence among us (X1); I feel guilty to express, but the sister spoke to me in such a way... I have told my story... she referred me to the social worker... Now I am waiting to go as per their suggestions I can't go back to my husband with my sister who is mentally disturbed than me... (X4); If nurses ask routinely to all the patients.... I won't feel the nurses discriminate me.... I may not worry that they are documenting this violence... (X7).*

Subtheme 2. Nature of inquiry by the nursing professionals. In this study, most participants felt that nurses should inquire about violence in a polite manner. They should listen to them patiently, confidentiality assured, and above all, nurses should believe their violence experiences. The following narratives explain the participants' expectations in enquiring about the experience of violence among women with mental illness: *I feel nurses should universally inquire about violence to all women patients.... It may help them to open up and ventilate their feelings. But they have to believe and listen to us patiently... (X2, X4, X5); I wanted them to ask politely..... they should listen to me what I am saying.... (X1,3); I want nurses to respect me... should believe me and should not inform to the family members (X11). Nurse should understand my situation empathetically... I don't want them to sympathize with me (X13).*

Discussion

This was the first study that explored the abusive experiences of women with mental illness and their opinion on routine screening for violence by nursing professionals in mental health care settings. Our findings showed that women with mental illness are experiencing various forms of domestic violence. Further, all the participants have expressed that nurses and other health care professionals (Psychiatrists, psychologists and social workers) should routinely enquire about violence experiences among women with mental illnesses.

The participants in this study were well aware of various forms of violence as they described the acts. For example, *hitting...pulling the hair, beating with a stick, torturing women, scolding women for simple things and purposefully making her cry,* etc. These findings were dissimilar to an Indian study conducted among psychiatric patients that found 42.7% of them were unaware of the word 'domestic violence'. However, after explaining to them about the concept of domestic violence, almost all the participants (99.7%) admitted that they were experiencing violence in their lives.[16]

The participants in this study expressed that they are undergoing different forms of abuse. Most of the participants revealed violence by their husbands and other family members. They felt helpless because of their dependency on family members

and the stigma associated with mental illness. Earlier studies supported these findings. A recent Indian study among persons with mental illness found that the prevalence of physical, emotional, sexual and economic violence was 16.3%, 25.3%, 2% and 11.3%, respectively. Younger age group and women were significantly associated with the occurrence of domestic violence.[16] Bhatia et al. (2016) reported that a majority (72%) of psychiatric outpatients were undergoing various forms of abuse. The most common form of violence was emotional (64%), followed by physical violence (39%) and sexual violence (21%).[12] A qualitative study from Bangladesh found that women with mental illness are experiencing all forms of violence (physical, emotional, sexual etc.). Most of the women were suffering from more than one form of violence. Sexual violence is a reality for a few women with mental illness but seldom is discussed.[11] These findings suggest the need to sensitize the family members about violence against women with mental illness.

Concerning nurses' inquiry, most participants have expressed that nursing professionals did not inquire about violence experiences either on the day of admission or during their stay in the hospital. However, nurses have probed if they observe any scars or injuries on women's bodies or if the patients are not having food or looking dull, not interacting with others, etc. They also expressed that nurses did not believe them even after they disclosed abuse and said they don't have time to listen. Despite these experiences, most of them felt that disclosing violence helped them in ventilating their feelings. The present study's findings also underline the importance of mental health professionals in identifying and responding appropriately to disclosures of violence in mental health care settings.

The main barriers cited by the participants for disclosure of violence were; fear of consequences such as violence may be amplified and family members may not bring them for future follow-ups, felt that nurses are busy, feelings of helplessness i.e. believing that no one can improve her situation, nurses may make fun of them after listening to their experiences, nurses may inform family members, etc. These findings were similar to a study that explored barriers related to disclosure of violence to professionals were; fear of the consequences including fear of Social Services involvement and consequent child protection proceedings, fear that disclosure would not be believed, and fear that disclosure would lead to further violence; the hidden nature of the violence; actions of the perpetrator; and feelings of shame.[16] These findings could be attributed to stigma related to mental illness. Further lack of acknowledgement for the abusive experiences may provide limited opportunities to women. These results also highlight the need for mental health services to establish appropriate domestic violence strategies and responses to ensure optimal care for this vulnerable population.

In line with a qualitative meta-synthesis,[17] most of the participants favoured routine enquiry for domestic violence. Further, few participants recommended that staff receive training to improve their skills for routine screening.[17] The participants in this study expressed that a hospital is the best place to disclose their abusive experiences with health care professionals. They firmly believed that nurses might help them to find solutions. Hence, they felt routine screening might help them to feel that they are not discriminated. A study found that victimized women agreed that health care providers should screen female patients for domestic violence.[18] On probing, the participants expressed their expectations on the way they wanted to be enquired. All of the participants felt nurses should provide a supportive environment to disclose abusive experiences. For example, nurses should speak to them politely with respect and dignity. Hence, it is necessary to train nurses to identify violence among women with mental illness and respond to them in a non-judgmental and compassionate manner.

Strengths and limitations. To the best of our knowledge, this was the first qualitative study

that explored abusive experiences among women with mental illness and their opinions on routine screening for domestic violence by nursing professionals in mental health care settings. The sample for this study was selected purposefully from different religious and cultural backgrounds. However, possible limitations of the present study include; sample bias as participants were recruited purposively and from a single setting. Further, acutely symptomatic women were excluded from this study. It may be quite possible that these women might be experiencing severe forms of domestic violence (physical and sexual violence). Hence, our findings may not be generalizable to all women with mental illness.

Conclusion. The present study elicited abusive experiences among women with mental illness. The results indicate that women with mental illness were undergoing more than one form of violence and most of the participants supported routine screening by nursing professionals. Nurses play an important role in identifying and supporting abused women in mental health care settings. Therefore, it is crucial to explore nurses' perceptions of routine screening of psychiatric patients for domestic violence. Further, it is necessary to enhance nurses' knowledge and skills through appropriate educational interventions on domestic violence to provide holistic care to this vulnerable population.

Implications for psychiatric nursing practice. Based on these results, it is important to consider that nurses need to enquire routinely about abusive experiences of women with mental illness. Furthermore, nurses need to be adequately trained on how to enquire about violence and to provide appropriate interventions to victimized women. However, our findings may be useful in developing policies and guidelines related to routine screening for domestic violence in mental health care settings.

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Barriers and Facilitators that Influence on Adopting Healthy Lifestyles in People with Cardiovascular Disease

Jessica Natalia Saavedra Espinosa[1,7]
https://orcid.org/0000-0003-1072-9615

Martha Yelitza Rodríguez Malagón[2,7]
https://orcid.org/0000-0002-8569-9011

Sara Pamela Londoño Granados[3,7]
https://orcid.org/0000-0002-7243-9392

Oscar Stiven Alméziga Clavijo[4,7]
https://orcid.org/0000-0001-8799-6397

María Camila Garzón Herrera[5,7]
https://orcid.org/0000-0003-3042-0412

Luz Patricia Díaz-Heredia[6,7]
https://orcid.org/0000-0002-7167-282X

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Barriers and Facilitators that Influence on Adopting Healthy Lifestyles in People with Cardiovascular Disease

Abstract

Objective. To measure lifestyle changes and describe the barriers and facilitators perceived that influence on adopting healthy lifestyles in people with cardiovascular diseases. **Methods.** Mixed study of concurrent execution in the public health center of the municipality of Tausa, Colombia. The quantitative phase corresponded to a longitudinal analytical method in which the FANTASTICO instrument was applied to 28 patients in this program between 0 and 120 days after a brief nursing intervention (face-to-face meetings and telephone calls). The qualitative phase was carried out with a micro-ethnographic approach applying a semi-structured interview to 12 out of 28 participants, 120 days after the intervention. **Results.** During the quantitative phase, a statistically significant change ($p < 0.05$) was the improvement of the total score and in the domains of activity, type of

1 Nurse. Email: jnsaavedrae@unal.edu.co
2 Nurse. Email: myrodriguezm@unal.edu.co
3 Nurse, Specialist in Public Health Administration. Email: saplondonogr@unal.edu.co
4 Nurse, Master's in clinical epidemiology (C). Email: osalmezigac@unal.edu.co
5 Nurse, Master's in clinical epidemiology (C). Email: mcgarzonh@unal.edu.co. Corresponding author
6 Nurse, PhD in Nursing. Email: lpdiazh@unal.edu.co
7 Faculty of Nursing, Universidad Nacional de Colombia. Bogotá, Colombia.

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personality and insight between day 0 and 120. During the qualitative phase, 13 categories arose regarding barriers and facilitators to adopt a healthy lifestyle: four facilitators and one barrier for physical activity, three facilitators and three barriers for feeding, and two facilitators for stress management. By integrating the results, it is possible to explain that, for the change in eating behaviors, physical activity and stress management, personal biological and psychological factors, interpersonal and situational influences coincide with the assumptions and propositions of the Health Promotion Model by Nola Pender. **Conclusion.** The participants' lifestyles changed positively in three of the domains and the total of the instrument, which can be explained by simultaneous triangulation, by the facilitators and perceived barriers as influential on adopting behaviors to acquire a healthy lifestyle.

Descriptors: healthy lifestyle; nursing; health promotion; cardiovascular diseases.

Barreras y facilitadores que influyen en la adopción de estilos de vida saludables en personas con enfermedad cardiovascular

Resumen

Objetivo. Medir el cambio en el estilo de vida y describir las barreras y los facilitadores percibidos que influyen en la adopción de un estilo de vida saludable en personas con enfermedad cardiovascular. **Métodos.** Estudio mixto de ejecución concurrente en el centro de salud público del municipio de Tausa, Colombia. La fase cuantitativa correspondió a un método analítico longitudinal, en el que se aplicó el instrumento FANTÁSTICO a 28 pacientes del programa a los 0 y 120 días de realizada una intervención breve de enfermería (encuentros presenciales y llamadas telefónicas). La fase cualitativa se realizó con un abordaje micro-etnográfico aplicando una entrevista semiestructurada a 12 de los 28 participantes, después de 120 días de realizada la intervención. **Resultados.** En la fase cuantitativa, se encontró un cambio estadísticamente significativo ($p<0.05$) en la mejoría del puntaje total y en los dominios de actividad física, tipo de personalidad e introspección entre el día 0 y 120. En la fase cualitativa, surgieron 13 categorías relacionadas con barreras y facilitadores para la adopción de un estilo de vida saludable: cuatro facilitadores y una barrera para la actividad física, tres facilitadores y tres barreras para la alimentación y dos facilitadores para el manejo del estrés. Al integrar los resultados, es posible explicar que, para el cambio en las conductas de alimentación, actividad física y manejo del estrés, inciden factores personales biológicos y psicológicos e influencias interpersonales y situacionales que coinciden con los supuestos y proposiciones del Modelo de Promoción de la Salud de Nola Pender. **Conclusión.** El estilo de vida de los participantes cambió positivamente en tres de los dominios y el total del

instrumento, lo que puede ser explicado mediante la triangulación simultánea, por los facilitadores y barreras percibidos como influyentes en la adopción de conductas para la adquisición de un estilo de vida saludable.

Descriptores: estilo de vida saludable; enfermería; promoción de la salud; enfermedades cardiovasculares.

Barreiras e facilitadores que influenciam a adoção de estilos de vida saudáveis em pessoas com doenças cardiovasculares

Resumo

Objetivo. Medir a mudança no estilo de vida e descreva as barreiras e facilitadores percebidos que influenciam a adoção de um estilo de vida saudável em pessoas com doenças cardiovasculares. **Métodos.** Estudo misto de execução concorrente no centro de saúde pública do município de Tausa, Colômbia. A fase quantitativa correspondeu a um método analítico longitudinal, em que o instrumento FANTÁSTICO foi aplicado a 28 pacientes do programa aos 0 e 120 dias após uma breve intervenção de enfermagem (encontros presenciais e ligações telefônicas). A fase qualitativa foi realizada com abordagem microetnográfica. Uma entrevista semiestruturada foi realizada com 12 dos 28 participantes, 120 dias após a intervenção. **Resultados.** Na fase quantitativa, foi encontrada mudança estatisticamente significativa (p <0.05) na melhora da pontuação total e nos domínios atividade física, tipo de personalidade e introspecção entre os dias 0 e 120. Na fase qualitativa, surgiram 13 categorias relacionadas às barreiras e facilitadores para a adoção de um estilo de vida saudável: quatro facilitadores e uma barreira para atividade física, três facilitadores e três barreiras para alimentação e dois facilitadores para controle do estresse. Ao integrar os resultados, é possível explicar que, para a mudança nos comportamentos alimentares, atividade física e gerenciamento do estresse, afetam fatores biológicos e psicológicos pessoais e influências interpessoais e situacionais que coincidem com os pressupostos e proposições do Modelo de Promoção da Saúde de Nola Pender. **Conclusão.** A pontuação do FANTÁSTICO dos participantes mudou positivamente em três dos domínios e no total do instrumento, o que pode ser explicado pela triangulação simultânea, pelos facilitadores e pelas barreiras percebidas como influenciadoras na adoção de comportamentos para a aquisição de um estilo de vida saudável.

Descritores: estilo de vida saudável; enfermagem; promoção da saúde; doenças cardiovasculares.

Introduction

The World Health Organization (WHO) defines healthy lifestyle as a "way of life based on identifiable behavioral patterns, determined by the interaction between personal individual characteristics, social interactions, and socioeconomic and environmental life conditions".[1] Different conducts have been studied that intervene in the conformation of a healthy lifestyle, among them, it highlights: having balanced nutrition, engaging regularly in physical activity, avoiding excess alcohol and eliminating cigarette smoking, which has been associated with higher life expectancy.[2] This theme represents great interest because adherence to healthy life habits impacts positively on the health and quality of life of people.[3]

The WHO states that an "optimal lifestyle to which all people can subscribe does not exist. Culture, income, family structure, age, physical capacity, home and work environment will make certain forms and conditions of life more attractive, feasible and suitable".[1] This is why the prevalence of diseases and their repercussions are attributed not only to individual factors, but to interpersonal relations and life conditions, a perspective under which it considered that lifestyles and habits "are shaped by personal decision and by influence from our environment and social group",[4] which is why adopting healthy practices also contemplates individual risk and vulnerability framed within society as factors that hinder or facilitate generation of changes in conduct toward healthy lifestyles.

In recent years, there is evidence of the growing expansion of chronic noncommunicable diseases (CNCD), which in 2019 caused 74% of the global deaths, being the principal cause of morbidity and mortality,[5] especially cardiovascular diseases, with 32.2% of deaths due to CNCD, having the highest proportion of deaths and disease burden in developing countries.[6] These diseases provoke alterations in the different spheres of humans, which impact on their quality of life and have a negative impact on them, their families, and society.

Cardiovascular diseases are the consequence of genetic, physiological, environmental and behavioral factors, with the last being closely related with their prevalence.[7] Thus, different interventions have been conducted to mitigate them, among them, the brief intervention, which is based on a counseling approach on harmful habits through a motivational interview, widely used to reduce excessive alcohol consumption, but with low documentation in the literature of its implementation in other behaviors that shape the lifestyle, whose coping strategies of coping allow greater effectiveness than traditional educational interventions.[8] Due to this, a quasi-experimental macro-project carried out in the municipality of Tausa, Cundinamarca, implemented this intervention between 2017 and 2018 to improve the lifestyles of people with

cardiovascular disease, from which this study is derived, given that it is necessary to determine if a change in conduct took place in the individual and investigate the factors that make individuals carry out or not said change, which is why a mixed research was conducted with qualitative approach.

This is due to the predominance of research with a quantitative approach and the complicated approach to the social, economic and environmental conditions and influences that affect people's behavior, which results especially important to consider the perceptions of people regarding these aspects as barriers or facilitators to change, given that evidence in terms of qualitative studies is insufficient and quantitative studies do not allow profound understanding of its influence. Likewise, little has been found on the matter of mixed studies that investigate the effect, as well as the experience of people with regard to presumably effective interventions on the change in the behaviors that constitute the lifestyle, as is the case of the brief intervention by nursing.

Hence, it is of great interest for nursing to inquire on how personal factors, interpersonal relations, and life conditions influence on adopting a healthy lifestyle to boost actions that promote wellbeing in the individuals, their families, and the community, fostering acquisition of health-promoting conducts, as proposed by the Health Promotion Model (HPM) by Nola Pender, where nursing professionals constitute the principal agent in charge of motivating people to maintain or reach an optimal state of health.[9]

Thus, it is fundamental to approach the issue from a mixed focus that keeps in mind not only the lifestyle change, but the perceptions of people on the factors that facilitate or make difficult adopting conducts that impact positively on health. Due to this, this study was conducted, seeking to measure lifestyle change and describe the barriers and facilitators perceived that influence on adopting a healthy lifestyle in people with cardiovascular disease who received a brief nursing intervention.

Methods

The present study has a mixed study of concurrent execution, which emerged from the research macro-project "Brief intervention in people with cardiovascular disease who have unhealthy behaviors and risky intake of alcohol". The quantitative phase was approached with a longitudinal analytical method, which measured lifestyle change and the qualitative phase was carried out through a micro-ethnographic approach to identify the barriers and facilitators that influence on the adoption of a healthy lifestyle; subsequently, complementation between methods was carried out, under the mechanism of simultaneous methodological triangulation.

Data collection took place between October 2017 and April 2018, with 30 people enrolled in the chronic disease program from the Tausa Health Center participated in the pilot test of the brief intervention, implemented by the macro-project, of which two did not comply with some of the inclusion criteria: being > 18 years of age, people diagnosed with cardiovascular disease, have completed 120 days after the brief intervention, having adequate cognitive and verbalization capacity, and having the signed informed consent to participate in the study. Hence, the study included 28 people with cardiovascular disease who were part of the program.

It must be indicated that the brief intervention of the macro study was developed as a therapeutic recourse, seeking to promote behavioral changes through face-to-face meetings and phone calls that lasted from 5 to 20 min.[10] The individual was motivated to commit to the change in any modifiable risk factor, like – for example – alcohol intake, cigarette smoking, or lack of physical activity. The brief intervention was developed based on the phases of feedback, responsibility, advice, options menu and empathy, during the meeting on the first day and after 30 days; thereafter, follow up was conducted at 90 and

120 days to recognize the lifestyle change, time the literature shows as appropriate to recognize maintenance of new conducts. [11]

The quantitative phase applied the FANTASTICO questionnaire immediately before carrying out the brief intervention (pre-intervention) and 120 days after (post-intervention). This instrument was designed by the Department of Family Medicine at McMaster University in Canada, whose total score is categorized in five levels, which permit stratifying the lifestyle into excellent (85 to 100 points), good (70 to 84 points), regular (60 to 69 points), poor (40 to 59 points), and at risk (≤39 points). A score of "excellent" indicates that the lifestyle generates an optimal influence for health; "good" means it exerts an adequate influence for health; "regular" indicates that benefits and risks exist; "poor and danger exists" warns that the individual's lifestyle implies greater risk for health.[12]

The questionnaire consists of 25 closed items that explore 10 domains on the physical, emotional, and social factors of lifestyle, which are: Family and friends (2 items), Activity (2 items), Nutrition (3 items), Tobacco (2 items), Alcohol (3 items), Sleep and stress (3 items), Type of personality (2 items), Insight (3 items), Conduction and work (2 items), and Other drugs (3 items). This questionnaire proposes three response options with a numerical value from 0 to 2 for each item of the domain, scored through a Likert-type scale, with a minimum score of 0 and maximum of 6 for the domains and a total score from 0 to 100. The instrument has been translated and validated in Colombia, showing adequate reliability.[12]

The statistical analysis used the *R* software and the *exactRankTests* library developed by Hothorn *et al*.,[13] applying the Wilcoxon Signed Rank non-parametric test to measure the lifestyle change over time in the total score of the instrument and per domain, using 95% confidence interval.

The qualitative phase conducted a semi-structured survey, applied after carrying out the brief intervention. The surveys were developed face-to-face and audio recorded for their subsequent transcription and analysis. Their transcription was done as they were collected, until reaching theoretical saturation, resulting in a total of 12 participants. The survey questions were evaluated by using the Flesch-Szigriszt Readability Index for health texts, through the INFLESZ software,[14] finding a rather easy degree of legibility on the INFLESZ Scale, which favored application of the survey, bearing in mind the low level of schooling of the participants.

This survey was composed of 13 questions that guided participants in identifying the goals agreed upon with respect to their health during the entire project and those they managed to comply or not, besides the general aspects that helped or hindered their fulfillment. In addition, it was aimed at identifying influence by the family, work, housing, environment, and health center on the change process to adopt a healthy lifestyle in the participants. After this, a qualitative analysis of content was performed to generate categories.

Finally, triangulation of the results was performed to describe how the facilitators and barriers perceived by the participants intervene in the change process to adopt a healthy lifestyle. For this, qualitative and quantitative results were analyzed separately, comparing them to identify their association, taking as referent the HPM by Nola Pender, with which the study seeks to comprehend why health promoting conducts are or are not adopted, considering both personal factors and interpersonal and situational influences that emerged from the qualitative analysis, associated with change in the total score and in the domains of the FANTASTICO questionnaire.

This study was approved by the University's Research Ethics Committee and was authorized by the E.S.E. Centro de Salud de Tausa, Cundinamarca. During the investigation, the dignity, integrity and rights of the participants were safeguarded, in accordance with national and international regulations and the ethical principles established in Legislation 911 of

2004,[15] which dictates the provisions regarding deontological responsibility for the exercise of the nursing profession in Colombia. In compliance of article 6, had an informed consent signed by the participants, protecting their identity and using the information for merely academic purposes.

Results

The sample was comprised of 21 women (75%) and seven men (25%), with mean age of 72 years, (minimum 50 years and maximum 93 years; SD = 10.49). With respect to place of birth, 75% were born in the municipality of Tausa and the majority lives in the rural zone (64.3%), this being the same percentage corresponding to socioeconomic level 1. As per level of schooling, the most frequent was incomplete primary (53.5%), followed by no educational level (25%). With relation to occupation, 75% were dedicated to the home; in terms of marital status, most were married (46.4%) or widowed (35.7%). All the individuals had arterial hypertension and were affiliated to the subsidized health scheme.

Regarding the quantitative phase, Table 1 presents the descriptive statistics and p value corresponding to the scores of each of the domains and of the total of the instrument. It may be noted that only the domains of Physical activity, Type of personality and Insight had a positive change with a statistically significant difference between the pre- and post-intervention (Wilcoxon Signed Rank; $p < 0.05$). For the total pre- and post-intervention scores of the FANTASTICO questionnaire, it was found that the participants changed to a healthy lifestyle, with a statistically significant difference ($p < 0.05$).

It was found that prior to the brief intervention, according to the score of the FANTASTICO questionnaire, 50% reported a good lifestyle, followed by 39.3% with excellent, 7.1% as regular, and 3.6% as poor. With respect to the post-intervention, 75% reported excellent lifestyle, followed by 17.9% as good, 3.6% as regular, and 3.6% as poor, indicating a statistically significant positive change in the proportion of people with an excellent lifestyle between before and after the intervention ($p < 0.05$).

For the qualitative phase, upon applying the survey, the information was classified by following the six steps of the content analysis technique, thus, emerging 13 categories taken from the expressions and words referred by the participants and which were distributed between barriers and facilitators perceived. Taking as reference the conducts that conform a lifestyle, these were classified within the areas of feeding, physical activity, and stress management.

The following describe the barriers and facilitators perceived by the participants to adopt the conducts that comprise a healthy lifestyle.

Facilitators for physical activity

***My family moves me*:** defined as the support provided by the family through companionship, motivation, and recommendations on doing exercise: *He invites me to go bring firewood or walk around for a while. (E3)*

***My activities keep me in shape*:** defined as the characteristic activities of the occupation that imply constantly engaging in physical activity: *Because of them one exercises and moves, one is concerned with seeing them, with milking them and everything and if not, one would have to sit around the house. (E10)*

***Here I can exercise*:** defined as the set of conditions of the physical space that surround the person and permit adopting continuous physical activity: *Given that I have the backyard, there I also do exercise, or here there is also a lot of open space, you just have to careful. (E11)*

***If I don't stop, I stay fine*:** defined as the aspects related with motivation, taste, purpose, or effort: *Have the purpose of walking and cycling for 30 minutes or more. (E4)*

Table 1. Descriptive statistics and p value of the scores per domain and total of the FANTASTICO questionnaire according to moment of evaluation

Variables	Day	Minimum	Maximum	Mean	Median	Standard deviation	*p value*
Family and friends	0 120	1 1	4 4	3.429 3.536	4 4	0.920 0.922	0.6133
Activity	0 120	0 0	4 4	2.25 3.071	3 3	1.798 1.214	0.0148
Nutrition	0 120	2 2	6 6	4.464 4.821	5 5	1.036 1.219	0.1643
Tobacco	0 120	3 2	4 4	3.964 3.929	4 4	0.189 0.377	1
Alcohol	0 120	4 3	6 6	5.786 5.821	6 6	0.499 0.612	0.75
Sleep and stress	0 120	2 1	6 6	4.571 4.929	5 5	1.259 1.412	0.1448
Type of personality	0 120	1 1	4 4	2.536 3.214	2.5 3.5	1.036 0.917	0.0041
Insight	0 120	1 1	6 6	3.964 4.893	4 5.5	1.374 1.423	0.0079
Conduction and work	0 120	1 2	4 4	3.5 3.75	4 4	0.839 0.518	0.1289
Other drugs	0 120	3 4	6 6	5.571 5.893	6 6	0.790 0.315	0.0937
Total score	0 120	48 58	98 100	81.21 87.71	78 90	10.712 11.491	0.0005

Barrier for physical activity

My body limits me: defined as the discomfort, pain, or physical limitation the individual manifests: *it is that my foot hurts, it's like inside, like an internal bunion as it is called, but it was not operated because it was not on the sole of the foot, so it was not operated. (E4)*

Facilitators for feeding

***Eating well with what we have and what we have we share*:** defined as their own financial means or an economic or material contribution provided by the family: *They help me, but to buy me the fruits and all that because they are working. (E11)*

***In my family we take care of each other and we collaborate with the food*:** defined as the support offered by the family, providing advice, care, or companionship and participating mutually: *My daughters also use to eat too much salt and we taught them that... and they also do the same, we all comply with it. (E7)*

***I eat better when I put my mind to it*:** defined as aspects related with the reasons, impulses, purposes, motivations, or tastes: *To diminish fat, that takes effort, but has to be done, yes, persuade yourself from those things to be able to overcome and see if you can achieve it. (E10)*

Barriers for feeding

***Eating what you can with the money you have*:** defined as shortness or lack of a financial means that makes it difficult to adopt healthy eating: *Yes, if you buy the medicine, you don't have enough for food, and if you buy the food, you won't have any left for the medicine, it's not easy. (E6)*

***Eating poorly at work*:** defined as the circumstances derived from the wage-earning work activity, which make it difficult to adopt healthy eating: *Sometimes when helping customers one stops, for example, having lunch on time, or they are having lunch and I am in the store so they have lunch first and I attend here and then have lunch. (E5)*

I think about changing what I eat, but there is something that defeats me: defined as the negative perception of the state of health that prevents the use of the land to grow food, the presence of unfavorable emotions towards some healthy foods, or the need to eat more than is due: *Eating, since one feels hungry, then with always complications that tempts one into eating. (E4)*

Facilitators for stress management

When talking to my neighbor, every day is calmer: defined as the companionship provided by a neighbor or friend, allowing individuals to diminish levels of tension in their lives: *Venting with someone whom you trust and, yes, that helped me a lot. (E9)*

***I get distracted and stay busy doing what I do*:** defined as the occupation of the person's time in activities at home, which facilitates stress management: *tasks around the house, household work. I have chickens, I have a calf and I take care of them [...] they actually help me because they distract me. (E9)*

Upon completing the qualitative analysis process, it was identified that people refer to family support, company of neighbors, occupation activities, and taste or purpose as facilitators for conducts of regular physical activity, balanced feeding, and stress management; however, they perceived that lack or scarcity of money, occupation, appetite, physical limitations, among others are barriers in the change process.

Discussion

This study, which sought to measure lifestyle change and describe the barriers and facilitators perceived that influence on adopting a healthy lifestyle, observed the lifestyle of the participants improved between the pre- and post-intervention. This may be explained from the facilitators perceived, like family support, company of neighbors, occupation activities, and taste or purpose, which helped to adopt regular physical activity regular, balanced feeding, and stress management. However, not all the participants reached an excellent lifestyle, given that they perceived as barriers the lack of money, occupation, appetite, physical limitations, among others.

It was found that physical activity increased the score in this domain, which is possible to associate with the facilitators mentioned by the participants, like the taste for physical activity, daily tasks, their personal effort, and family support, which seen from the HPM, can be interpreted as interpersonal influence due to the support provided by the family, situational influence due to the available options perceived in the occupation and the environment, and personal psychological factors due to the personal competence. As mentioned by Silva *et al*.,[16] facilitators exist that permit adopting physical activity, among them, factors from the interpersonal level that include social support networks; factors from the physical environment; and factors from the intrapersonal level, which correspond to the individual preferences and the combination with pleasant and useful activities, like daily activities. In spite of the change in this domain, not all the participants achieved the maximum score because the discomfort, ailments, and physical limitations evidenced in

the perceived barrier made it difficult to perform regular physical activity, which is related with the biological personal factors in the HPM. This agrees with Silva *et al.,*[16] and Cortés[17] who indicate as barriers to engage in physical activity the current state of health and the very physiological aging process.

For nutrition, no significant change was noted, which is associated with barriers related with situational influence, given reportedly poor control in feeding due to their working conditions and lack or scarcity of money to acquire adequate foods for their health; and personal psychological factors, given that they mentioned dislike towards some healthy foods, temptation to eat, appetite and taste for unhealthy foods. However, there was an increase in the frequency of the maximum score, which may be associated with facilitators, like personal purpose and family support, corresponding in the HPM to personal psychological factors and las interpersonal influence, respectively.

A systematic review by Kelly *et al*.,[18] gathers different studies on healthy conducts and, specifically on feeding, establishes family support as facilitator, which is determinant to accept and maintain healthy feeding. Furthermore, it identifies sociocultural factors as barriers, including conditions at work. Likewise, the study establishes that low family wages implies lower consumption of fruits, vegetables and fiber, and mentions that psychological factors, like lack of capacity and motivation, as well as the ingrained preferences for unhealthy foods, hinder adopting the conduct.

Finally, stress management kept in mind change in the domains of: Sleep and stress, Type of personality, Insight, Family and friends, and Conduction and work for the integration with the results from the qualitative phase, which were only facilitators. The Sleep and stress domain evidenced that by day 120 frequency increased in the maximum score; the Family and friends domain showed that the frequency in the maximum score remained high both on day 0 as in day 120, which may be associated with the facilitator perceived for this conduct – described in the HPM, as the interpersonal influence of neighbors and friends, which highlights dialogue, talking and venting with others.

Likewise, for the Conduction and work domain, the frequency of the maximum score for days 0 and 120 remained high, which is associated with person's time spent in distracting activities in the home, which corresponds in the HPM to a positive situational influence for stress management. Additionally, the scores obtained in the domains of Type of personality and Insight had a statistically significant change, which behave – according to the HPM – as personal psychological factors that can influence upon stress management, however, were not perceived by the participants as facilitators for this conduct.

It is scarce evidence regarding the factors that influence upon this behavior. A study by Barrier [19] about the participation of adults in physical-recreational activities, points to an association between physical activity and sociability, given that it implies a greater connection with their environment and, hence, greater social interaction, which facilitates stress management. Moreover, it exposes that older adults who engage in regular physical activity improve their self-esteem and social situation, interpreted as improvement in the physical, social, and psychological dimension. Nevertheless, it does not describe explicitly the influence exerted by interpersonal relations and activities of the occupation on stress management.

This research managed to identify the barriers and facilitators that influence on adopting healthy lifestyles in a rural population. The total score of the FANTASTICO questionnaire increased by day 120 after conducting the brief intervention, obtaining improved lifestyle, specifically, in the domains of Activity, Type of personality and Insight. Through triangulation, it was possible to associate and explain lifestyle change with the facilitators and barriers perceived, according with the Health Promotion Model by Nola Pender, establishing

that change toward a healthy lifestyle is explained with the facilitators perceived by the participants; however, the maximum scores were not achieved in some domains, which may be associated with the barriers perceived in the change process.

The mixed focus permitted knowing the influence of personal characteristics, as well as the interpersonal relations and life conditions on adopting a healthy lifestyle, given that not only was change determined, but that the perception of the participants was considered as to factors that behave as barriers or facilitators for said change to take or not take place. Through this study, it was possible to know how the context influenced on individuals to achieve lifestyle modifications, to then propose future interventions that respond to the needs of the rural population to promote adoption of healthy conducts that improve their behaviors, supporting health care and enriching the nursing profession.

The evidence demonstrates that the interventions seeking to improve lifestyles focus generally on healthy people or with risk factors, which is not generalizable to individuals with cardiovascular diseases, which is why this study serves as base to carry out tertiary prevention strategies that permit behavioral change toward healthy conducts.

This research had limitations, such as sample size of the quantitative component, given that it does not represent a significant percentage of the study population; it must be highlighted that the results are applicable to individuals in chronic disease programs in the rural area because they were our study population.

Regarding the qualitative phase, some of the limitations were the possibility of ignoring or minimizing data, which was controlled with an independent work and thereafter a joint analysis by the researchers, to obtain greater interpretative and analytic wealth. Additionally, the study considered the possibility of a Hawthorne effect, given that the individual was aware of the intervention received, while the researcher's effect was controlled, given that the initial measurement and the intervention were carried out as of the macro-project.

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Original article

National Early Warning Score 2 Lactate (NEWS2-L) in Predicting Early Clinical Deterioration in Patients with Dyspnoea in Prehospital Care

Raúl Villanueva Rábano[1,4]
https://orcid.org/0000-0002-2072-145X
Francisco Martín-Rodríguez[2,4,5]
https://orcid.org/0000-0002-1773-2860
Raúl López-Izquierdo[3,4]
https://orcid.org/0000-0001-5092-4138

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National Early Warning Score 2 Lactate (NEWS2-L) in Predicting Early Clinical Deterioration in Patients with Dyspnoea in Prehospital Care

Abstract

Objective. To evaluate the ability of the NEWS2-L (National Early Warning Score 2 Lactate) scale to predict the risk of early clinical deterioration (mortality within 48 hours) in patients with dyspnoea treated by the Medical Emergency Services compared with NEWS2 and lactate in isolation. **Methods.** Prospective, multi-centre study of a cohort of 638 patients with dyspnoea treated in the ambulance and priority-transferred to a hospital emergency service in the cities of Valladolid, Salamanca, Segovia or Burgos (Spain). We collected clinical, analytical and demographic data. The main outcome measure was all-cause mortality within 48 hours. The recommendations of the Royal College of Physicians were followed to calculate NEWS2. When NEWS2 and LA prehospital values were obtained, the two values were added together to obtain the NEWS2-L.

1 Nurse, M.Sc. Intensive Care Medicine Department, University Clinical Hospital of Valladolid Email: raulderivia@gmail.com. Corresponding author.
2 Nurse, Ph.D. Valladolid I Emergency Mobile Unit, Health Emergencies Management. Email: fmartin@saludcastillayleon.es.
3 Physician, Ph.D. Emergency Department, Rio Hortega University Hospital of Valladolid. Email: rlopeziz@saludcastillayleon.es.
4 Castilla y León Regional Health Management (SACYL), Spain.
5 Advanced Clinical Simulation Centre, Department of Medicine, Dermatology and Toxicology, University of Valladolid, Spain.

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Results. Mortality within 48 hours was fifty-six patients (8.8%). The NEWS2-L scale obtained an area under the curve (AUC) of the receiver operating characteristics (ROC) for mortality within 48 hours of 0.854 (CI 95% 0.790–0.917), at seven days of 0.788 (CI 95% 0.729–0.848) and at 30 days of 0.744 (CI 95% 0.692–0.796); in all cases $p<0.001$, with a significant decrease between the value at 48 hours and at 30 days. **Conclusion.** The NEWS2-L scale was found to be significantly superior to the NEWS2 scale and similar to lactate in predicting early clinical deterioration in patients with dyspnoea. This scale can help a nurse detect these patients early, as part of their regular practice, and thus guide therapeutic efforts.

Descriptors: dypsnea; biomarkers; prehospital care; early warning score; hospital mortality; clinical decision-making.

National Early Warning Score 2 y ácido láctico (NEWS2-L) en la predicción del deterioro clínico precoz en pacientes con disnea en los cuidados prehospitalarios

Resumen

Objetivo. Evaluar la capacidad de la escala NEWS2-L (National Early Warning Score 2-lactate) para predecir el riesgo de deterioro clínico precoz (mortalidad hasta las 48h) en pacientes con disnea atendidos por Servicios de Emergencias Médicas, comparado con la escala NEWS2 y el ácido láctico en solitario**. Métodos.** Estudio prospectivo multicéntrico de cohorte de 638 pacientes con disnea atendidos en ambulancia y trasladados con alta prioridad a un servicio de urgencias hospitalarias en las ciudades de Valladolid, Salamanca, Segovia y Burgos (España). Se tomó información de variables clínicas, analíticas y demográficas, de las cuales la de resultado principal fue la mortalidad por cualquier causa hasta las 48 horas. Para el cálculo del NEWS2 se siguieron las recomendaciones del Royal College of Physicians. Una vez obtenidos los valores del NEWS2 y del AL prehospitalario se sumaron ambos valores y se obtuvo la NEWS2-L. **Resultados.** La mortalidad, antes de las 48, horas fue de 56 pacientes (8.8%). La escala NEWS2-L obtuvo un Área Bajo la Curva – Característica Operativa del Receptor (ABC-COR) para la mortalidad antes de las 48 horas de 0.854 (IC95% 0.790-0.917), a siete días de 0.788 (IC95% 0.729-0.848) y a 30 días de 0.744 (IC95% 0.692-0.796); en todos los casos $p<0.001$), lo que experimentó un descenso importante entre su valor a las 48 h y a los 30 días. **Conclusión.** La escala NEWS2-L mostró ser significativamente superior a la escala NEWS2 y similar al ácido láctico en la predicción del deterioro clínico

precoz en pacientes con disnea. Esta escala es una ayuda para que la enfermera en su práctica habitual detecte a estos pacientes en forma temprana y así poder orientar los esfuerzos terapéuticos.

Descriptores: disnea; biomarcadores; atención prehospitalaria; disnea; puntuación de alerta temprana; mortalidad hospitalaria; toma de decisiones clínicas

National Early Warning Score 2 e ácido láctico (NEWS2-L) na predição de deterioração clínica precoce em pacientes com dispneia no atendimento pré-hospitalar

Resumo

Objetivo. Avaliar a capacidade da escala NEWS2-L (National Early Warning Score 2-lactato) de predizer o risco de deterioração clínica precoce (mortalidade de até 48h) em pacientes com dispneia tratados em Serviços de Emergência Médica, em comparação com a escala NEWS2 e a ácido láctico em solitário. **Métodos.** Estudo prospectivo de coorte multicêntrico de 638 pacientes com dispneia atendidos por ambulância e transferidos com alta prioridade para um serviço de emergência hospitalar nas cidades de Valladolid, Salamanca, Segovia e Burgos (Espanha). As informações foram obtidas a partir de variáveis clínicas, analíticas e demográficas, sendo a principal variável de desfecho a mortalidade por todas as causas em até 48 horas. Para o cálculo do NEWS2, foram seguidas as recomendações do Royal College of Physicians. Uma vez obtidos os valores do NEWS2 e do AL pré-hospitalar, ambos os valores foram somados e o NEWS2-L foi obtido. **Resultados.** A mortalidade antes de 48 horas foi de 56 pacientes (8,8%). A escala NEWS2-L obteve uma área sob a curva - característica operacional do receptor (ABC-COR) para mortalidade antes de 48 horas de 0.854 (IC 95% 0.790-0.917), em sete dias de 0.788 (IC 95% 0.729-0.848) e aos 30 dias de 0.744 (95% CI 0.692-0.796); em todos os casos p <0,001), experimentando uma diminuição significativa entre o seu valor às 48 he aos 30 dias. **Conclusão.** A escala NEWS2-L mostrou ser significativamente superior à escala NEWS2 e semelhante ao ácido láctico na predição da deterioração clínica precoce em pacientes com dispneia. Essa escala é um auxílio para o enfermeiro em sua prática habitual detectar precocemente esses pacientes e, assim, ser capaz de orientar os esforços terapêuticos.

Descritores: dispneia; biomarcadores; assistência pré-hospitalar; escore de alerta precoce; mortalidade hospitalar; tomada de decisão clínica.

Introduction

Dyspnoea is defined as a subjective feeling of a lack of air or difficulty breathing and is a symptom present in a great variety of pathologies, often associated with different degrees of respiratory failure.[1] Dyspnoea represents nearly 50% of patients admitted to Tier 3 hospitals, with the figure falling to around 25% in outpatient centres.[2] It also accounted for 3.7 million annual visits to emergency departments in the United States.[3] Dyspnoea is also present in a large number of patients admitted to intensive care units (ICUs),[4] consuming a large quantity of health system resources.

At the prehospital level, it is a common reason to seek medical care, with different levels of mortality and morbidity.[5] These patients often have to be treated by prehospital emergency services and many require evacuation from the site in high-priority situations. As mentioned, dyspnoea is a symptom that in addition to being an independent predictor of mortality in many clinical situations is associated with a complex and heterogeneous group of patients that present different serious diseases with multiple co-morbidities, involving a wide range of diagnostic possibilities including heart failure, chronic obstructive pulmonary disease (COPD) and respiratory tract infections.[6,7]

Given the clinical complexity patients with dyspnoea present and considering the importance of a rapid detection of deterioration in these patients, it is important to find which tool is optimal in establishing a prognosis for them from the first moments of care. In this context, the National Early Warning Score 2 (NEWS2) is one of the scales validated in the prehospital setting and has a correlation between a high prehospital score in NEWS2 and a higher incidence of adverse outcomes.[8–10] The role of lactate (LA) as a predictor of poor prognosis generally in patients treated by mobile and hospital emergency services is also well known,[11] acting as a classic anaerobic metabolism marker in the body, indicating hypoxia and tissue hypoperfusion.[12]

The detection and handling of early signs of deterioration in the patient is a highly complex process influenced by many factors. In this regard, nursing personnel play a very important role in identifying clinical deterioration in potentially critical patients due to how closely they work with the patient. Understanding and handling early warning scales like NEWS2 and the meaning of biomarkers like LA is particularly important in these circumstances and can serve as an aid for nurses to guide their actions.[13] The aim of this study was to assess the ability of the NEWS2-L (National Early Warning Score 2 Lactate) scale to predict the risk of early clinical deterioration (mortality within 48 hours) in patients with dyspnoea treated by the medical emergency services compared with the NEWS2 scale and lactate in isolation. A secondary goal was to check the scale's prognostic ability to determine mortality at seven and 30 days.

Methods

Study design and ethical considerations. We conducted a prospective, multi-centre cohort study on an opportunity sample of patients with dyspnoea treated by an Emergency Mobile Unit (EMU) in the cities of Valladolid, Salamanca, Segovia and Burgos (Spain). These patients were subsequently transferred to their reference hospital. The main outcome measure was all-cause mortality within 48 hours. Secondarily, mortality at seven and 30 days after treatment by the EMU was studied at a global level.

Participants. Between 1 April 2018 and 30 June 2019, patients aged ≥ 18 years were included if they had called the 112 emergency number requesting urgent help and after assessment by the ambulance (EMU) on the scene were determined to have dyspnoea (medical origin) as the reason for their call and were taken to their reference hospital by ambulance. Excluded from the study were patients where it was not possible to obtain informed consent, patients under the age of 18, pregnant women, patients with an acute psychiatric disorder or documented terminal disease, patients who died during the callout or transfer, patients evacuated by other means of transport (e.g., basic life support units or private means) or patients who following assessment by the EMU required no further urgent care and were discharged onsite.

Variables and data collection. The endpoints and predictors were collected by independent researchers at each hospital, obtained from a review of patient electronic medical records. The primary endpoint was collected by the clinical investigators tasked with data collection. Epidemiological values were also collected during the callout (age, sex, arrival times, treatment and transfer and reason for the call), as were the clinical values needed to calculate NEWS2 (respiratory rate, oxygen saturation, use of supplemental oxygen, systolic blood pressure, heart rate, temperature and level of consciousness; confusion was considered a score on the Glasgow Coma Scale of under 15 points). Analytical values (glucose and venous LA) were also collected. The prehospital main diagnosis was also recorded on the basis of the International Classification of Diseases (ICD-11, https://icd.who.int/browse11/l-m/en). The heart rate, blood pressure and oxygen saturation measurements were performed with the LifePak® 15 monitor (Physio-Control, Inc., Redmond, USA). Temperature was obtained with a tympanic thermometer, model ThermoScan® PRO 6000 (Welch Allyn, Inc, Skaneateles Falls, USA), glucose was obtained with the FreeStyleOptium Neo glucometer (Abbott Laboratories, Illinois, USA) and LA with the Accutrend Plus lactometer (Roche Diagnostics, Mannheim, Germany).
By reviewing the patient's electronic medical record 30 days after the index event, the following hospital values were recorded: admission, need for ICU, in-patient days and mortality at 48 hours and at seven and 30 days.

NEWS2-L determination. The recommendations of the Royal College of Physicians[14] were followed to calculate NEWS2 (see Table 1).

Scale 2 should be used in patients with hypercapnic respiratory failure to weigh up the oxygen saturation score. Each category was classified from zero to three points. The scores of each category were added together to obtain a total. Composite scores over five (or three in any of the parameters) triggered an urgent review. A score over seven triggered a review by the critical care team or an advanced medical response team. Abbreviations: NEWS2: National early warning score 2; HR: heart rate; RR: respiratory rate; T: temperature; SBP: systolic blood pressure; SpO2: oxygen saturation; suppl. O2: supplemental oxygen; GCS: Glasgow coma scale. Taken from the Royal College of Physicians.[14]

The LA values were collected by the nursing personnel of each EMU in three phases: 1) The test strip was inserted after switching on the instrument. 2) A drop of venous blood (15–40

Table 1. National Early Warning Score 2 Scale

NEWS2	3	2	1	0	1	2	3
HR (bpm)	≤ 40		41–50	51–90	91–110	111–130	≥131
RR (bpm)	≤8		9–11	12–20		21–24	≥25
T (ºC)	≤35		35.1–36	36.1–38	38.1–39	≥39.1	
SBP (mmHg)	≤90	91–100	101–110	111–219			≥220
SpO2 (%) Scale 1	≤91	92–93	94–95	≥96			
SpO2 (%) Scale 2	≤83	84–85	86–87	88–92 ≥93 Air	93–94 Oxygen	95–96 Oxygen	≥97 Oxygen
Suppl. O2		Oxygen		Air			
GCS (points)				15			≤14

μL) was deposited on the test strip. 3) The lid was closed and a result obtained after 60 seconds. The maximum time between blood collection and placement of the sample in the device was one minute. All the measuring devices were calibrated every 100 measurements, always by the same researcher, using the Accutrend® BM-Control-Lactate control solution (Roche Diagnostics, Mannheim, Germany). When the NEWS2 and LA prehospital values were obtained, the two values were added together to obtain NEWS2-L.

Statistical analysis. All the data was stored in an XLSTAT® BioMED database for Microsoft Excel® version 14.4.0. (Microsoft Inc., Redmond, WA. USA), and SPSS version 20.0. (IBM, Armonk, NY. USA) which were also used for statistical analysis. The database was cleaned prior to statistical analysis by means of logical tests, range tests (for the detection of extreme values) and data consistency. The presence and distribution of unknown values of all variables were subsequently analysed. Qualitative variables were described by absolute frequencies with their 95% confidence interval (CI 95%). Quantitative variables were described as median and interquartile range (IQR). The Mann-Whitney U-test was used to compare quantitative variables. The Chi-square test for two-way tables or the contrast of proportions was used to determine the association or dependence relationship between qualitative variables; if necessary (percentage of boxes with expected values less than five, greater than 20%), we used Fisher's exact test. NEWS2, NEWS2-L and LA area under the curve (AUC) of the receiver operating characteristic (ROC) was calculated for mortality at 48 hours and at seven and 30 days, along with the best score in each case for greatest combined sensitivity and specificity (Youden index). We also calculated the positive predictive value (PPV), negative predictive value (NPV), positive probability ratio (PPR) and negative probability ratio (NPR) for these scores. In all tests, a confidence level of 95% and a p-value of less than 0.05 were considered significant. The values obtained were subsequently compared against each other, establishing a comparison between the three tests studied (NEWS2-L vs NEWS2 vs LA).

Ethical aspects. The study was approved by the Clinical Research Ethics Committees of all the participating centres. All the patients (or guardians) signed the informed consent form. The highest safety standards were followed at all times, protecting participant confidentiality and complying with the national and international regulations included in the Declaration of Helsinki on biomedical research involving human subjects.

Results

A total of 638 patients with dyspnoea were included between 1 April 2018 and 30 October 2019 (Figure 1). Mortality at two days was 8.8% (56 patients). Median age was 79 years (IQR 68-86 years), with 39.9% women (255 patients).

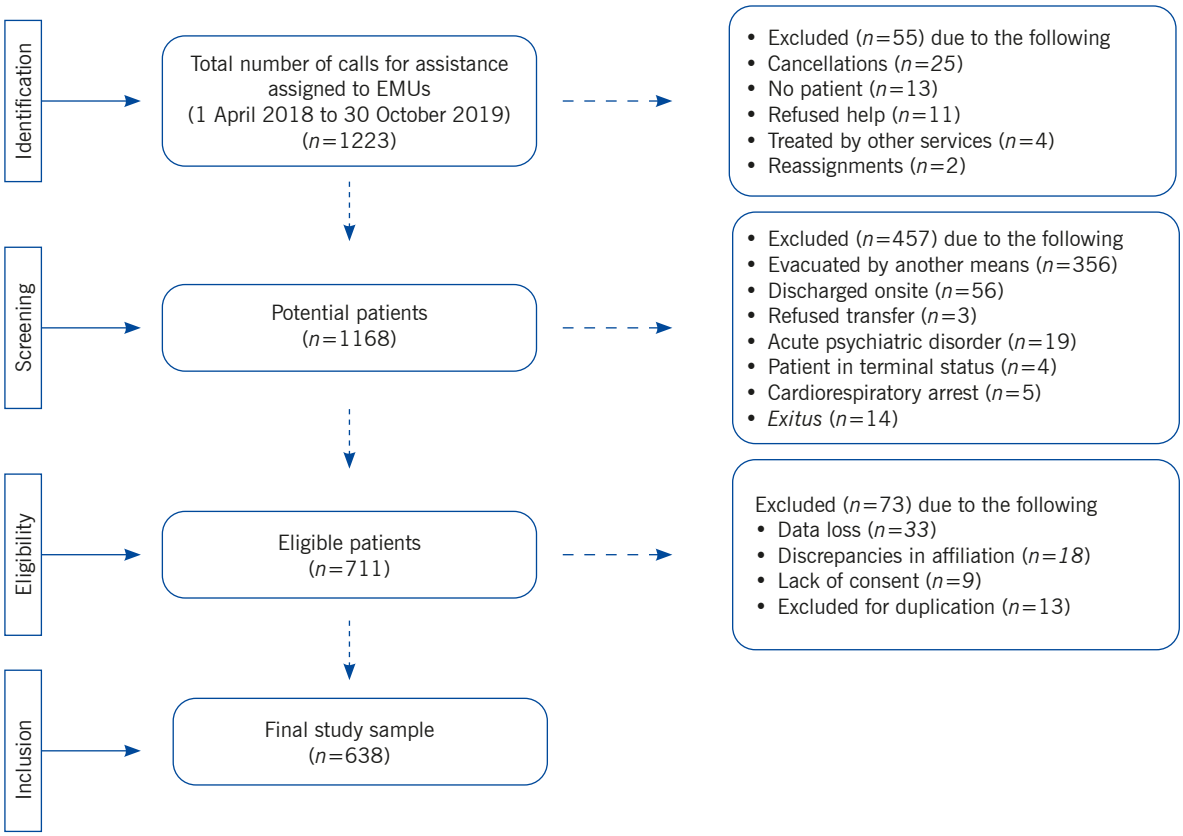

Figure 1. Diagram of participants

Stratifying the sample by predominant pathology in patients with dyspnoea who were treated and transferred, 170 (26.6%) were patients with chronic obstructive pulmonary disease (COPD), 164 (25.7%) were patients with heart failure (HF), 198 (31%) were patients with infections and the remaining 106 (16.6%) were patients with any condition other than the above, covered under the mixed group of 'Other'. The values of the patients' clinical/epidemiological characteristics were

provided as absolute and percentage values or as median and interquartile range as appropriate. Abbreviations: IQR: interquartile range; RR: respiratory rate; SpO2: oxygen saturation; O2: oxygen; SBP: systolic blood pressure; HR: heart rate; GCS: Glasgow coma scale; LA: lactate; NEWS2: National Early Warning Score 2; NEWS2-L: National Early Warning Score 2 Lactate; COPD: chronic obstructive pulmonary disease; HF: heart failure; ICU: intensive care unit (Table 2).

Table 2. Clinical-epidemiological characteristics of participants. The mortality statistics refer to death within two days

Characteristics*	Total	Mortality at 48 hours		*p*_value
		Survivors	Non-survivors	
Number; n (%)	638	582 (91.2)	56 (8.8)	
Sex: female: (n (%)	255 (39.9)	239 (41.1)	16 (28.6)	0.068
Age (years); Median (IQR)	79 (68–86)	78 (68–85)	81 (72–88)	0.09
Time (minutes); Median (IQR)				
Arrival	10 (8–13)	10 (8–13)	10 (8–14)	0.681
Assistance	30 (25–36)	30 (24–36)	31 (26–39)	0.830
Transfer	9 (7–13)	10 (7–12)	9 (7–17)	0,122
Prehospital assessment; Median (IQR)				
RR (bpm)	26 (19–35)	26 (19–34)	34 (24–38)	0.028
SpO2 (%)	89 (80–94)	90 (82–95)	78 (67–84)	<0.001
O2; (n (%)	256 (40.1)	228 (39.2)	28 (50)	0.115
SBP (mmHg)	140 (121–164)	142 (123–165)	132 (98–151)	0.021
HR (bpm)	100 (80–115)	99 (80–115)	103 (90–125)	0.055
Temperature (ºC)	36.7 (36–37.5)	36.7 (36–37.5)	36.6 (35.5–37.4)	0.064
GCS (points)	15 (15–15)	15 (15–15)	11 (6–15)	<0.001
Blood sugar (mg/dl)	139 (115–180)	138 (115–178)	150 (124–209)	0.058
LA (mmol/L)	3.1 (2.1–4.1)	2.9 (2–3.8)	4.9 (4.3–6.9)	<0.001
Scales: Median (IQR)				
NEWS2	8 (5–10)	7 (5–9)	11 (9–14)	<0.001
NEWS2-L	10.7 (7.5–13.7)	10.3 (7.2–12.8)	17.1 (13.5–20)	<0.001
In-patient follow up; n (%)				
O2	428 (67)	374 (64.3)	54 (96.4)	<0.001
Admitted	505 (79)	450 (77.3)	56 (100)	<0.001
ICU	75 (11.7)	57 (9.8)	18 (32.1)	<0.001
Diagnostic groups; n (%)				
COPD	170 (26.6)	162 (27.8)	8 (14.3)	0.063
HF	164 (25.7)	149 (25.6)	15 (26.8)	
Infections	198 (31)	175 (30.1)	23 (41.1)	
Other	106 (16.6)	96 (16.1)	10 (17.9)	

Values provided as absolute and percentage values or as median and interquartile range as appropriate. Abbreviations: IQR: interquartile range; RR: respiratory rate; SpO2: oxygen saturation; O2: oxygen; SBP: systolic blood pressure; HR: heart rate; GCS: Glasgow coma scale; LA: lactate; NEWS2: National Early Warning Score 2; NEWS2-L: National Early Warning Score 2 Lactate; COPD: chronic obstructive pulmonary disease; HF: heart failure; ICU: intensive care unit.

Comparing the NEWS2 scale vs LA vs NEWS2-L, the NEWS2-L scale obtained the best AUC-ROC for mortality at 48 hours with 0.854 (CI 95% 0.790–0.917; $p<0.001$) with a cut-off point of 12.2. Similarly, the NEWS2-L scale exceeded the other two tests for seven and 30 days, with AUC-ROCs for the NEWS2-L scale of 0.788 (CI 95% 0.729–0.848; $p<0.001$) and 0.744 (CI 95% 0.692–0.796; $p<0.001$) and cut-off points of 12.7 and 12.3, respectively. Comparing the three tests, lactate obtained the best sensitivity (91.1%) and specificity (79.4%) in mortality at 48 hours, followed by the NEWS2-L scale and with a considerable difference with respect to the NEWS2 scale (Table 3).

Table 3. Best-scoring combined sensitivity and specificity cut-off points (Youden index) for mortality at 48 hours and at seven and 30 days for NEWS2, NEWS2-L and LA

	Mortality		
Number; n (%)	48 hours 56 (8.8)	7 days 84 (13)	30 days 130 (20)
NEWS2			
Median (IQR)	8 (5–10)	8 (5–10)	8 (5–10)
AUC (CI 95%)	0.809 (0.739–0.879)	0.755 (0.692–0.817)	0.715 (0.662–0.769)
p value	<0.001	<0.001	<0.001
Cut-off point	10	11	9
Se (CI 95%)	71.4 (58.5–81.6)	53.6 (43.0–63.8)	66.9 (58.5–74.4)
Sp (CI 95%)	75.8 (72.1–79.1)	85.7 (82.6–88.4)	66.9 (62.7–70.9)
PPV (CI 95%)	22.1 (16.7–28.7)	36.3 (28.4–45.0)	34.1 (28.6–40.1)
NPV (IC 95%)	96.5 (94.4–97.8)	92.4 (89.8–94.4)	88.8 (85.2–91.6)
PPR (CI 95%)	2.95 (2.37–2.67)	3.76 (2.82–5.0)	2.02 (1.70–2.41)
NPR (CI 95%)	0.38 (0.25–0.58)	0.54 (0.43–0.69)	0.49 (0.38–0.64)
Diagnostic accuracy	75.4 (71.9–78.6)	81.5 (78.3–84.3)	66.9 (63.2–70.5)
Odds ratio	7.82 (4.25–14.39)	6.94 (4.25–11.33)	4.09 (2.72–6.17)
NEWS2-L			
Median (IQR)	10.7 (7.57–13.7)	10.7 (7.57–13.7)	10.7 (7.57–13.7)
AUC (CI 95%)	0.854 (0.79–0.917)	0.788 (0.729–0.848)	0.744 (0.692–0.796)
p value	<0.001	<0.001	<0.001
Cut-off point	12.2	12.7	12.3
Se (CI 95%)	87.5 (76.4–93.8)	76.2 (66.1–84.0)	66.2 (57.7–73.7)
Sp (CI 95%)	70.3 (66.4–73.8)	75.5 (71.7–78.9)	73.8 (69.8–77.5)
PPV (CI 95%)	22.1 (17.1–28)	32.0 (25.9–38.8)	39.3 (33.0–45.9)
NPV (CI 95%)	98.3 (96.6–99.2)	95.4 (93.1–97.0)	89.5 (86.2–92.1)
PPR (CI 95%)	2.94 (2.51–3.45)	3.10 (2.57–3.75)	2.53 (2.09–3.06)
NPR (CI 95%)	0.18 (0.09–0.36)	0.32 (0.21–0.47)	0.46 (0.36–0.59)
Diagnostic accuracy	71.8 (68.2–75.1)	75.5 (72.1–78.7)	72.3 (68.7–75.6)
Odds ratio	16.55 (7.35–37.26)	9.84 (5.74–16.85)	5.51 (3.64–8.33)

Table 3. Best-scoring combined sensitivity and specificity cut-off points (Youden index) for mortality at 48 hours and at seven and 30 days for NEWS2, NEWS2-L and LA (Cont)

	Mortality		
	48 hours	7 days	30 days
Number; n (%)	56 (8.8)	84 (13)	130 (20)
Lactate			
Median (IQR)	3 (2–4.1)	3 (2–4.1)	3 (2–4.1)
AUC (CI 95%)	0.849 (0.785–0.914)	0.756 (0.693–0.818)	0.710 (0.656–0.763)
p value	<0.001	<0.001	<0.001
Cut-off point	4.1	4.1	4.1
Se (CI 95%)	91.1 (80.7–96.1)	69.0 (58.5–77.9)	56.2 (47.6–64.4)
Sp (CI 95%)	79.4 (75.8–82.5)	80.3 (76.8–83.4)	81.5 (77.9–84.6)
PPV (CI 95%)	30.5 (24.1–37.9)	34.7 (27.9–42.2)	43.7 (36.4–51.3)
NPV (CI 95%)	98.9 (97.4–99.5)	94.5 (92.0–96.2)	87.9 (84.6–90.5)
PPR (CI 95%)	4.41 (3.68–5.29)	3.51 (2.81–4.38)	3.03 (2.39–3.85)
NPR (CI 95%)	0.11 (0.05–0.26)	0.39 (0.28–0.53)	0.54 (0.44–0.66)
Diagnostic accuracy	80.4 (77.1–83.4)	78.8 (75.5–81.8)	76.3 (72.9–79.5)
Odds ratio	39.22 (15.3–100.49)	9.11 (5.48–15.13)	5.64 (3.73–8.52)

Abbreviations: NEWS2: National early warning score 2; NEWS2-L: National early warning score 2-Lactate; Se: sensitivity; Sp: specificity; PPV: positive predictive value; NPV: negative predictive value; PPR: positive probability ratio; NPR: negative probability ratio.

Discussion

In view of the results obtained, we can see that the NEWS2-L scale has a good ability to predict early clinical deterioration in patients with dyspnoea, significantly superior to the NEWS2 scale and similar to LA.

We also found that both analysed scales and LA lost their predictive capability over the long term. This loss of efficacy was most pronounced in the case of LA, which might be related to the fact that this biomarker increases considerably in situations of hypoxia and hypoperfusion[15] and that these situations are more relevant in early clinical deterioration but less important in long-term mortality.[16] This in turn would explain why LA showed such a similar efficacy to NEWS2-L in the first 48 hours in patients with dyspnoea, given that these patients are likely to present more situations of hypoxia than patients affected by other, non-respiratory syndromes.[17]

The results suggest that using NEWS2 type scales in combination with LA – in this case, the NEWS2-L scale – could be very worthwhile for predicting early clinical deterioration in patients with dyspnoea, helping prehospital emergency personnel and hospital critical care and emergency personnel in decision-making. Early warning scales have been attracting interest for some time because of their potential to stratify the risk of deterioration in complex patients and many studies have been conducted around them. In their systematic review on early warning scales, Patel *et al.*[18] concluded that very low values in these scales were capable of discriminating non-

severity and very high values were able to predict significant early clinical deterioration.

Jo *et al.*[19] analysed whether associating lactate with the ViEWS early warning scale (ViEWS-L) could increase its predictive value. This scale demonstrated a greater predictive value for hospital mortality than ViEWS without LA (ViEWS-L 0.802 vs ViEWS 0.742, $p=0.009$), a superiority that was maintained at one, two, three and four weeks. These findings are in line with our own findings between the NEWS2-L vs NEWS2 scales, although we evaluated mortality at 48 hours and at seven and 30 days. Another study by Young *et al.*[20] carried out on haematology-oncology patients concluded that the application of an early warning scale (MEWS) in combination with LA significantly reduced the need to activate intensive care units due to patient deterioration, reinforcing the idea that associating an early warning scale with LA improves prognostic capacity.

A similar methodological study was conducted on this research, assessing another scale, called preNEWS2-L (Pre-Hospital National Early Warning Score 2 Lactate). It produced similar data in some aspects and an AUC-ROC of 0.91 (CI 95% 0.83–0.86) for mortality at 48 hours. However, that study referred specifically to the prehospital setting and included patients with all types of conditions, unlike the present study that only included patients with dyspnoea, so the obtained results are not directly comparable, although they do shore up the aforementioned idea of how associating LA with an early warning scale can improve its performance.[21]

Even though it is obvious that no scale can replace a suitable patient history and clinical examination by highly qualified personnel, many studies have concluded that the different early warning scales are a useful and efficient tool in predicting clinical deterioration among potentially serious patients, enabling a better clinical approach.[22–24] Karlotte *et al.,* in their systematic review[25] analysing the impact of early warning scales on nurses' competence, concluded that these results were mainly beneficial in their professional practice, although in some cases they could produce contradictory outcomes. The increase in the use of these types of scale featuring biomarkers like LA could, as shown in this study, be of major help for nursing personnel who use these assessment tools.

This study has a number of limitations: firstly, there are many early warning systems, making it hard to select between them, although, as shown throughout the study, the NEWS2 scale has very high psychometric values today and is extensively used in both hospital and prehospital settings. Secondly, LA was used for its demonstrated clinical utility, but there are other analytical parameters such as blood gases, electrolytes, etc., which can today be obtained in the prehospital setting and could offer more data for clinical patient handling. Finally, this study focused on patients whose reason for assistance was dyspnoea and studied their mortality at 48 hours and at seven and 30 days after the values obtained at the time of prehospital care, but going forwards it would be interesting to have studies that assess the way the scale evolves using serial measurements in the hospital setting and appraising their efficacy in other conditions. It could also be very interesting to obtain and compare several early warning scales against each other and obtain other analytical values at the highest levels of lactate, studying the combinations that offer the most efficacy for predicting early clinical deterioration by groups of patients with different conditions.

In short, and after analysing the AUC-ROCs mentioned previously in the results, we can state that the NEWS2-L scale performed better than the NEWS2 scale and similar to LA in predicting mortality within the first 48 hours in patients seen for dyspnoea, and that the NEWS2-L scale beat LA as a predictor of mortality at seven and 30 days and was therefore superior overall. This scale can be useful in detecting patients likely

to suffer significant clinical deterioration and more mortality from the time of their prehospital treatment, helping guide health professionals' efforts to choose more or less intensive therapies with the aim of safeguarding the patient. Its regular use by emergency medical services could be considered to develop the most efficient and suitable response.

In the specific case of nurses, their role is fundamental to the correct implementation of the scale since they are the people who regularly collect the data needed to prepare it. Having a validated, well-performing scale like this facilitates their regular practice in the early detection of patients who are starting to deteriorate and can increase and guide therapeutic efforts. Correctly collecting the necessary variables, applying the scale and interpreting the result obtained, then consequently acting on it are also a challenge for nurses.

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Original article

Impact of an Educational Intervention Aimed at Nursing Staff on Oral Hygiene Care on the Incidence of Ventilator-Associated Pneumonia in Adults Ventilated in Intensive Care Unit

Melissa Sánchez Peña[1,5]
https://orcid.org/0000-0003-1590-6270

Luz Angélica Orozco Restrepo[2,5]
https://orcid.org/0000-0002-1112-9278

Freddy Andrés Barrios Arroyave[3,5]
https://orcid.org/0000-0002-0990-1679

Oscar Felipe Suárez Brochero[4,6]
https://orcid.org/0000-0001-8214-9914

Impact of an Educational Intervention Aimed at Nursing Staff on Oral Hygiene Care on the Incidence of Ventilator-Associated Pneumonia in Adults Ventilated in Intensive Care Unit

Abstract

Objective. This work sought to evaluate the impact of an educational intervention on oral hygiene care aimed at nursing care staff, on the incidence of Ventilator-Associated Pneumonia (VAP) in adults from an ICU in Colombia. **Methods.** Quasi-experimental study pre- and post-educational intervention aimed at nursing staff in which theoretical-practical sessions were conducted during 12 weeks to explain different oral hygiene techniques according to the oral conditions of patients. The study gathered sociodemographic, clinical, and characteristic variables of the oral and dental care received. The VAP was diagnosed according with international criteria. **Results.** The educational intervention received participation from 60 individuals (40 nurses and 20 nursing aides), 80%

1 Odontologist, Health Management and Audit Specialist. Email: melissa.sanchez@uam.edu.co
2 Nurse, M.Sc. Email: luz.orozcor@uam.edu.co
3 Physician, M.Sc. Email: freddy.barrios@uam,edu.co
4 Physician, M.Sc. Email: oscar.suarez@uam.edu.co
5 Fundación Universitaria Autónoma de las Américas, Pereira, Colombia.
6 Hospital Universitario San Jorge, Pereira, Colombia.

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were women. The work collected data from 171 patients, 70 (40.9%) cared for after the educational intervention. Daily oral and dental care by the staff increased from 29.6% to 92.8% after the intervention. Although the accumulated incidence of VAP diminished from 8.9% to 2.8% and the rate of incidence dropped from 9 to 3.5 cases per 1000 days of intubation, these changes were not statistically significant. **Conclusion**. The educational intervention aimed at the nursing staff in oral care reduced the incidence of VAP in adults connected to ventilator in ICU; although this decrease was not statistically significant, it was a clinically relevant result for the institution, which is why it is necessary to continue the educational strategies on oral health studied in this staff.

Descriptors: pneumonia, ventilator-associated; health education, dental; oral hygiene; intensive care units; nursing staff.

Impacto de una intervención educativa dirigida a personal de enfermería sobre los cuidados de higiene oral en la incidencia de neumonía asociada a ventilador en adultos en Unidad de Cuidado Intensivo

Resumen

Objetivo. Evaluar el impacto de una intervención educativa sobre los cuidados de higiene oral dirigida a personal asistencial de enfermería, en la incidencia de Neumonia Asociada a Ventilador (NAV) en adultos de una UCI en un hospital de Pereira, Colombia. **Métodos.** Estudio cuasiexperimental pre y posintervención educativa dirigida a personal de enfermería en la que se realizaron sesiones teórico-prácticas durante 12 semanas para explicar diferentes técnicas de higiene oral según la condición bucal de los pacientes. Se recolectaron variables sociodemográficas, clínicas y características de la atención bucodental recibida. Se diagnosticó la NAV de acuerdo con criterios internacionales. **Resultados.** En la intervención educativa participaron 60 personas (40 enfermeros y 20 auxiliares de enfermería), 80% eran mujeres. Se recolectaron datos de 171 pacientes, 70 (40.9%) atendidos después de la intervención educativa. La atención bucodental diaria por parte del personal se incrementó de 29.6% a 92.8%, después de la intervención. Aunque la incidencia acumulada de NAV disminuyó de 8.9% a 2.8% y la tasa de incidencia bajó de 9 a 3.5 casos por 1000 días de intubación, estos cambios no fueron estadísticamente significantes. **Conclusión.** La intervención educativa dirigida al personal de enfermería en cuidado oral redujo la incidencia de NAV en los adultos conectados a ventilador en UCI; si bien esta disminución no fue estadísticamente significativa,

sí fue un resultado clínicamente relevante para la institución, por lo que deben continuarse las estrategias educativas estudiadas en salud bucal.

Descriptores: neumonía asociada al ventilador; educación en salud dental; higiene bucal; unidades de cuidados intensivos; unidades de terapia intensiva; personal de enfermería.

Impacto de uma intervenção educativa dirigida à equipe de enfermagem sobre os cuidados de higiene bucal na incidência de pneumonia associada à ventilação mecânica em adultos ventilados em Unidade de Terapia Intensiva

Resumo

Objetivo. Avaliar o impacto de uma intervenção educacional sobre cuidados de higiene bucal dirigida a profissionais de enfermagem sobre a incidência de Pneumonia Associada à Ventilação (PAV) em adultos ventilados em uma UTI na Colômbia. **Métodos.** Estudo quase experimental antes e após intervenção educativa dirigido a trabalhadores de enfermagem em que foram realizadas sessões teórico-práticas durante 12 semanas para explicar as diferentes técnicas de higiene bucal de acordo com a condição bucal dos pacientes. Foram coletadas variáveis sociodemográficas, clínicas e características dos cuidados bucais recebidos. A PAV foi diagnosticada de acordo com critérios internacionais. **Resultados.** Na intervenção educativa, participaram 60 pessoas (40 enfermeiras e 20 auxiliares de enfermagem), 80% eram mulheres. Os dados foram coletados de 171 pacientes, 70 (40.9%) compareceram após a intervenção educativa. A higiene bucal diária pela equipe aumentou de 29.6% para 92.8% após a intervenção. Embora a incidência cumulativa de VAP tenha diminuído de 8.9% para 2.8% e a taxa de incidência tenha diminuído de 9 para 3.5 casos por 1000 dias de intubação, essas alterações não foram estatisticamente significativas. **Conclusão.** A intervenção educativa direcionada à equipe de enfermagem em higiene bucal reduziu a incidência de PAV em adultos conectados a um ventilador na UTI; embora essa redução não tenha sido estatisticamente significativa, foi um resultado clinicamente relevante para a instituição, portanto, as estratégias educacionais em saúde bucal estudadas nessas pessoas devem ser mantidas.

Descritores: pneumonia associada à ventilação mecânica; educação em saúde bucal; higiene dentária; unidade de terapia intensiva; recursos humanos de enfermagem.

Introduction

Mechanical ventilation-associated pneumonia (VAP) is one of the infections associated with health care most frequent in intensive care units (ICU) globally, with an incidence rate of 16.8 cases per 1000 ventilator-days, prolongs the hospital stay, increases care costs, and presents mortality up to 50%[1,2] caused by the migration of oropharyngeal microorganisms onto the pulmonary parenchyma and it is considered early if it develops during the first four days of ventilation, and late from the fifth day to 48 hours post-extubation.[1,3] In Latin American countries, like Colombia, Ecuador, Venezuela, Mexico, Peru, and Bolivia, VAP has an incidence between 40% and 63%;[4] Cuba has been reported up to 70% of patients ventilated with VAP and mortality up to 60%.[5] Colombia estimates an occurrence of 60%, an incidence rate of 10 to 13.6 cases per 1000 ventilator-days and mortality of 70%.[6]

The World Health Organization has highlighted that VAP prevention measures are simple, low cost, and their effectiveness is based on the practices, responsibility and behavioral changes of the ICU health staff.[7] It has been demonstrated that greater occurrence of VAP is due to inadequate training of the health staff in elementary practices of infection prevention and control.[4] The Zero-VAP European Program has managed to reduce 43% of VAP and avoid 341 deaths annually. The most-efficient VAP prevention measures include oral care, given that it diminishes bacterial colonization of the pulmonary parenchyma. Eradication of microorganisms from the oral cavity, through mechanical hygiene (three times per day) and use of chlorhexidine in concentrations from 0.12% to 2%, reduce the risk of VAP.[8] Even in European countries, like Finland, 92% of the health staff had doubts on the indications of oral care.[9] Oral care is inconsistent and inadequate in ICU, according that found in the literature. Due to the foregoing, greater investment is required in VAP prevention programs, with enhancing of knowledge to modify the practices of the nursing staff regarding oral care, becoming a strategy that can be carried out in collaboration networks with other hospitals.

Given the lack of evaluations of these types of educational interventions on oral health in the practices by the health staff or on the incidence of VAP of critical patients in Colombia, this research work evaluated the impact of an educational intervention aimed at nursing staff in oral hygiene care on the incidence of VAP in adults treated with mechanical ventilation in an ICU in Pereira, Colombia.

Methods

Quasi-experimental quantitative study to compare the incidence of pneumonia before and after implementing a care strategy of oral health with nursing staff. It included nurses from ICU and adult patients (> 18 years of age) in ICU with mechanical ventilation, who accepted to participate (or their relative or caretaker); the study excluded patients with any pulmonary infection as cause of admission to ICU. The first period (April 2 to September 22 of 2018) evaluated a group of patients seen under standard care.

An educational intervention was designed aimed at the nursing staff (40 professionals and 20 aides) that provides care to ICU patients, this had three stages: diagnostic, intervention, and evaluation. The diagnostic stage applied a questionnaire to the health staff to identify knowledge on oral care of patients in ICU, bearing in mind the standard care of patients evaluated during the first period.

From the results evidenced, the intervention stage was developed with theoretical base on the Keller's ARCS Motivational Design Model focused on maximizing the educator's effectiveness by focusing the learner's attention, relevance, trust and satisfaction via workshops, demonstrations, teaching aids, work models[10] with theoretical-practical sessions during 12 weeks, which explained different techniques of oral hygiene according to patient's oral condition. The sessions addressed themes regarding the anatomy and physiology of the oral cavity, oral pathologies common in ICU patients, identification model of oral problems, ventilator-associated pneumonia, and oral hygiene techniques for intubated patients focused on the use of the toothbrush and dental floss to remove bacterial plaque, application of chlorhexidine with gauze to clean the teeth and all the mouth structures, the change of tube clamping to avoid ulcers, and the importance of hydrating the lips. Each of the participants individually carried out a supervised practice of oral care on a patient and supplies were delivered to the hospital to care for all patients admitted to the ICU until the end of the study. These practice sessions lasted for three months.

The evaluation stage conducted follow up of the nursing staff three times per week, identifying the use of these supplies and application of oral health in the patients. In addition, follow up was conducted of the hygiene activity records in the clinical charts. A second group of patients was evaluated (June 26 to December 27 of 2019). During the implementation of the care measure, the study had toothbrushes, tooth paste, and chlorhexidine at 0.12% to perform oral care of patients. In both groups, information was collected on the following variables: sociodemographic factors, clinical antecedents, remitting service, body mass index, oxygenation level on admission to ICU, renal function, and the characteristics of the oral and dental care received. As primary outcome, it was possible to register the presence of VAP and, as variables of interest, the orotracheal intubation time, stay in ICU, hospital stay, and hospital mortality were described.

The VAP diagnosis used combined criteria from: a) the American Thoracic Society (ATS) together with the Infectious Diseases Society of America (IDSA), and b) Centers for Disease Control (CDC), included in the 2013 Colombian consensus on nosocomial pneumonia[11] and accepted in Colombia by the National Health Institute and the Ministry of Health in its 2017 update of the National Epidemiological Surveillance Protocol for Device-Associated Infections.[3] According with the aforementioned, the study considered as case every pneumonia documented in the unit 48 h after endotracheal intubation was established in the presence of new or progressive infiltrates and persistent in the chest X-ray (or cavitation or consolidation), in addition to at least one of the following criteria: fever (> 38 °C) or hypothermia with no other recognized cause, leukopenia (< 4000 PMN/ml) or leukocytosis (> 12000 PMN/ml), altered mental state with no other recognized cause in adults > 70 years of age, purulent

tracheal secretions, and oxygenation disorder. All the cases were confirmed by clinic and none by laboratory and, finally, were classified as early or late VAP cases.[12]

Bivariate analysis was performed according to the pre- and post-intervention group; proportions were compared through the Chi-squared test. When its assumptions were not fulfilled, Fisher's Exact test was used. Medians and interquartile ranges were compared via the Mann-Whitney U test, upon applying the Shapiro-Wilks test to verify the fit to the normal distribution. For the multivariate analysis, the VAP rate was constructed according to the days of intubation. With significant variables identified in the bivariate analysis, Poisson's regression model was constructed to adjust the estimated effect of the intervention by potential confounders. Incidence rate ratios (IRR) were estimated as measures of association with 95% confidence intervals and p values. RStudio software, version 1.2.5033 (©2009-2019 RStudio, Inc.) was used.

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Results

In the stages of the educational intervention, 40 nursing professionals and 20 nursing aides participated with work experience in ICU between 2 and 10 years and 80% were women. The initial questionnaire evidenced that all the staff had knowledge about VAP and with respect to the patient's oral care, 16% knew of chlorhexidine for oral use, 5% revised the patient's oral and dental state and evolution, 93% was unaware of the most frequent oral pathologies in intubated patients and their prevention.

Data was collected from 171 patients, 70 (40.9%) of them seen after conducting the educational intervention. In total, 54% of the participants were men, with a mean age of 56 years for both groups; prevalence of patients affiliated to the subsidized scheme, without statistically significant differences. In the group intervened, higher prevalence was found of cardiopathy ($p = 0.02$), greater proportion of individual's body mass index classified as normal ($p = 0.06$), greater PAFI median ($p = 0.02$), and greater use of phenytoin ($p=0.007$); moreover, lower frequency of high BUN was identified ($p = 0.007$). The other characteristics are described in Table 1.

Table 1. Medical antecedents, characteristics of admission and care of patients with mechanical ventilation in ICU of a tier III hospital

Characteristic	Not intervened (*n* = 101)	Intervened (*n* = 70)	*p value*	Total (*n* = 171)
Mean age (IQR)	56 (39-72)	56 (40-70)	0.645	56 (39-70)
Age groups; *n* (%)			0.812	
< 20 years	4 (3.9)	3 (4.3)		7 (4.1)
20 to 39 years	23 (22.7)	13 (18.5)		36 (21.1)
40 to 64 years	35 (34.6)	29 (41.4)		64 (37.4)
65 years or more	39 (38.6)	25 (35.7)		64 (37.4)
Women; *n* (%)	41 (40.6)	30 (42.8)	0.768	71 (45.5)
Social security; *n* (%)				
Subsidized	74 (73.3)	48 (68.6)	0.779	122 (71.3)
Traffic accident policies	13 (12.9)	10 (14.3)		23 (13.5)
Contributive	11 (10.9)	7 (10)		18 (10.5)
Other	3 (2.8)	5 (7.1)		8 (4.7)
Antecedents; *n* (%)				
Diabetes Mellitus	15 (14.8)	8 (11.4)	0.519	23 (13.4)
Arterial hypertension	28 (28.1)	-		28 (-)
Chronic kidney disease	14 (13.8)	5 (7.1)	0.169	19 (11.1)
COPD	12 (11.8)	7 (10)	0.700	19 (11.1)
Cardiopathy	6 (6.9)	13 (18.6)	0.020	20 (11.7)
Asthma	1 (0.9)	0 (0)	0.591	1 (0.6)
Infectious antecedents; *n* (%)				
HIV (AIDS)	3 (2.9)	0 (0)	0.270	3 (1.7)
Pulmonary tuberculosis	5 (4.9)	3 (4.3)	0.573	8 (4.7)
Urinary tract infection				1 (1.0)
Referral service				
Emergency	80 (79.2)	57 (81.4)	0.122	137(80.1)
Surgery	1 (0.9)	4 (5.7)		5 (2.9)
Hospitalization	20 (19.8)	9 (12.8)		29 (16.9)
BMI classification; *n* (%)			0.063	
Low weight	10 (9.9)	2 (2.8)		12 (7.0)
Normal	50 (49.5)	48 (68.6)		98 (57.3)
Overweight	34 (33.6)	16 (22.8)		50 (29.2)
Obesity	7 (6.9)	4 (5.7)		11 (6.4)
State of oxygenation; *n* (%)				
Normal (400-500)	23 (22.7)	8 (11.4)	0.138	31 (18.1)
Mild hypoxemia (300-399)	15 (14.8)	7 (10.0)		22 (12.9)
Moderate hypoxemia (200-299)	28 (27.7)	22 (31.4)		50 (29.2)
Severe hypoxemia (< 199)	35 (34.6)	33 (47.1)		68 (39.7)
PAFI median (IQR)	260 (158 -386)	215 (138-286)	0.029	239 (149-348)
Kidney function on admission; *n* (%)				
Creatinine (≥ 1 .5 mg/dL)	33 (32.7)	23 (32.8)	0.980	56 (32.7)
Ureic nitrogen (≥ 38 .6 mg/dL)	60 (59.4)	27 (38.6)	0.007	87 (50.8)
Systemic medication; *n* (%)				
Phenytoin	26 (25.7)	32 (45.7)	0.007	58 (33.9)
Corticoids	1 (0.9)	1 (1.4)	0.793	2 (1.2)
Nutritional support; *n* (%)				
Enteral	83 (82.2)	64 (91.4)	0.172	147 (85.9)
Parenteral	15 (14.8)	4 (5.7)		19 (11.1)
None	3 (2.9)	2 (2.8)		5 (2.9)

IQR= Interquartile range. COPD= chronic obstructive pulmonary disease. BMI= body mass index. PAFI= ratio of PaO/ fraction of inspired oxygen.

The record of activities with oral care rose from 29.6% to 92.8%, tooth brushing by patients was registered in 45.6% and application of chlorhexidine in 70% of patients seen after the intervention, with significant differences ($p < 0.001$) compared with patients before the intervention. Table 2 presents the variables referring to oral and dental care, like frequency of tooth brushing and use of chlorhexidine.

Table 2. Characteristics of oral care of patients with mechanical ventilation in ICU of a tier III hospital

Characteristic	Not intervened (n = 101)	Intervened (n = 70)	*p value*	Total (n = 171)
Oral and dental care			<0.001	
None	71 (70.3)	5 (7.1)		76 (44.4)
One time	25 (24.7)	54 (77.1)		79 (46.2)
Two or more times	4 (4.9)	11 (15.7)		16 (9.35)
Tooth brushing	1 (0.9)	34 (48.6)	<0.001	35 (20.5)
Chlorhexidine - Mouthwash	3 (2.9)	49 (70)	<0.001	52 (30.4)
Aides participate in caring	33 (32.7)	66 (94.3)	<0.001	72 (42.1)
Daily aspiration of secretions			<0.001	
One time	0 (0)	2 (2.8)		2 (1.2)
Two times	64 (63.4)	63 (90		127 (74.3)
Three times	31 (30.7)	5 (7.1)		36 (21)
Four times	6 (5.9)	0 (0)		6 (3.5)

Table 3 shows the description of other variables of interest and Table 4 details the results of the multivariate analysis. The accumulated VAP incidence diminished from 8.9% to 2.8% after the intervention and the rate dropped from 9 to 3.5 cases per 1000 days of intubation, both differences were not significant. The work estimated a decrease in mortality from 38.6% to 30% after the intervention, without statistical significance. All the VAP cases were classified as late (Table 3).

Table 3. Outcomes of patients with mechanical ventilation in ICU of a tier III hospital

Characteristic	Not intervened (n = 101)	Intervened (n = 70)	*p-value*	Total (n = 171)
Ventilator-associated pneumonia	9 (8.9%)	2 (2.8%)	0.203	11 (6.4%)
Median days of intubation (IQR)	7 (4-13)	7 (4-12)	0.383	7 (4-13)
Density of incidence	9.0/1000 days	3.5/1000 days	0.225	7.0 /1000 days
Median ICU stay (IQR)	10 (5-17)	10 (6-16)	0.755	10 (5-16)
Median Hospital stay (IQR)	17.5 (9.5-28.5)	18 (13-29)	0.704	18 (11-29)
Deceased	39 (38.6%)	21 (30%)	0.246	60 (35.1%)

IQR= Interquartile range. ICU= Intensive care unit

The multivariate model constructed with Poisson's regression permits estimating 65% reduction of the incidence rate after the intervention adjusted by the referral service, antecedent of cardiopathy or chronic kidney disease, body mass index, PAFI classification, and ureic nitrogen (>20 mg/dL). This effect found showed no confidence intervals or statistically significant probability values.

Table 4. Poisson regression model for incidence rate ratio of ventilator-associated pneumonia in patients with mechanical ventilation in ICU of a tier III hospital

Characteristic	Raw IRR (95% CI)	*p* value	Adjusted IRR (95% CI)	*p*-value
Intervention in oral care	0.38 (0.04-1.8)	0.225	0.35 (0.07-1.8)	0.213
Referral from				
Hospitalization	4.8 (0.1-37.6)	0.2280.470-	6.4 (0.58-71.5)	0.128
Surgery	1.6 (0.27-7.2)		1.5 (0.37-6.6)	0.534
Emergency	1		1	-
Antecedent of cardiopathy	0.64 (0.14-4.5)	0.7560.198	0.45 (0.04-4.3)	0.496
Antecedent of kidney disease	2.5 (0.44-10.6)		2.1 (0.4-9.6)	0.326
BMI				
Low weight	0 (0-4.1)	0.339-	0.05 (0 -.)	0.995
Normal	1	-	1	-
Overweight or obesity	0.77 (0.16-3)	0.701	0.55 (0.15-2.02)	0.372
State of PAFI oxygenation				
Normal	1	-	1	-
Mild	1.58 (0.11-21)	0.665	1.1 (0.15-8.5)	0.905
Moderate	0.79 (0.09-9.5)	0.797	0.6 (0.1-4.2)	0.670
Severe	0.83 (0.11-9.1)	0.809	0.5 (0.07-3.1)	0.452
Ureic nitrogen > 20 mg/dL	2.1 (0.51-12.4)	0.271	2 (0.4-9.2)	0.340

IRR: incidence rate ratio; BMI: body mass index; mmHg: millimeters of mercury; PAFI= ratio of PaO/fraction of inspired oxygen. Pseudo R2 = 0.139 (p = 0.488)

Discussion

Within the national context, and according with the literature reviewed, this is the first work that seeks to verify the impact of an educational intervention in the nursing staff of adult ICU on oral and dental hygiene measures to reduce VAP in patients treated with invasive mechanical ventilation. In this sense, the contribution of this research lies in that its results constitute an important input for the reference institution to generate strategies based on local evidence that permit reducing this adverse event associated with health care, being a care priority according with the guidelines by the Ministry of Health and NHI on the quality and safety of care, especially regarding device-associated infections.[3] Although in the group of patients who received care from the trained nursing staff no statistically significant reduction was shown of the VAP incidence or VAP rate per ventilator days, this reduction is clinically relevant for the clinical practice, given that it allows the institution to make decisions to continue improvement processes of interventions

in oral and dental hygiene in critically-ill patients with high risk of VAP. Thus, the fact of reducing the incidence from 8.9% to 2.8% and from 9 to 3.5 cases/1000 ventilator days evidences an important reduction, considering the severity of a single case of VAP, in terms of hospital stay, use of antibiotics, medical supplies, and other costs associated with care that a public hospital must destine to caring for events related with providing health care.[13]

Likewise, the unadjusted decrease in overall mortality in the unit from 38.6% to 30%, post-intervention, is a valuable data for the institution, given that – although not statistically significant – it does provide insights on the impact the strategy could have in the long term, besides providing tools for future studies to evaluate the other clinical factors and factors derived from care that impact on the reduction or increase in mortality rates in the service.

Of the predictors included in the equation, with a clinically relevant effect (although not statistically significant), it is possible to affirm that – for the group of patients benefiting from the training intervention in oral and dental hygiene to the nursing staff (post group) – this intervention managed to reduce the risk VAP up to 65% compared with patients from the group not exposed (pre group). In addition, patients from hospitalization and surgery had higher risk of VAP (up to 5.4 times and 0.5 times more, respectively, compared with those admitted from emergency). Similarly, patients with antecedent of kidney disease also had twice the risk of developing VAP with respect to patients without this antecedent. Besides, patients with registry of ureic nitrogen > 20 mg/dL had twice the risk of VAP when compared with those who had kidney function above said value. All these associations were produced by adjusting by the effect of the other co-variables included in the final equation and with these constants remaining, and although none of them was statistically significant, they were clinically relevant.

Our study did not find that antecedent of cardiopathy, overweight or obesity, oxygenation measured via PAFI (mmHg/FIO_2), and the value of ureic nitrogen were predictors associated with VAP incidence in the study population. However, in spite of their non-significance, these variables were included in the final Poisson regression model for adjustment effects as possible confounding variables. Additionally, these were left in the final equation due to the model´s convergence.[14] Thus, the apparently not significant, paradoxical results and contradictory with the literature, seen in Table 4 (antecedent of cardiopathy, overweight or obesity, moderate and severe PAFI, as protective factors and which would reduce VAP incidence) lack clinical interest for the effects of this study. Further, even when several authors[15,16] have demonstrated that some of these conditions are risk factors, their results are not comparable with those in this study, given that, in addition to the p value of association, the risk measurements employed in said investigations [17] have included Odds Ratio, Hazard Ratio, and Relative Risk, but not the IRR that is used in our study, given that the dependent variable of interest herein is the VAP measured as a rate of incidence.

In this study, the initial rate of VAP prior to the intervention was nine cases per 1000 days of intubation, lower than in various countries in the world, as indicated by the report by the International Nosocomial Infection Control Consortium,[1] where the global rate was 16.8 per 1000 days in 503 ICU from 43 participating countries. It was also lower than the rate reported in the European study denominated ICU-HELICS (Hospitals in Europe Link for Infection Control through Surveillance)[18,19] in which the indicator varied from 9.9 pneumonia cases/1000 dMV (Germany) to 24.5 (Holland); and lower than in Spain, which reported a VAP rate that ranges between 15.5 and 17.5 episodes/1000 dMV, with mortality varying between 30% and 34.8%, according with records from the National Study on Nosocomial Infection Surveillance in ICU (ENVIN-UCI, for the term in Spanish), conducted from 2003 to 2005 and which included over 21000

patients.[20] However, our result was higher than that reported in 1991 in the United States by the National Nosocomial Infections Surveillance System (NNIS): 5.8 cases/1000 days of MV; [17] although it should be clarified that these differences may be because during said moment, the VAP diagnostic criteria had not been updated.

When comparing within the Latin American context, our rates were lower than those reported by Mexico (18.6 cases per 1000 days),[4] among others. In relation with the VAP incidence, our baseline proportion was 8.9%, lower than in countries, like Cuba, which have reported incidences of up to 70% of patients with invasive mechanical ventilation.[19]

Regarding the comparison with Colombia, the data are relatively lower than in the rest of the national studies, with prevalence reported up to 60% and rates that range between 10 and 13.6 cases per 1000 ventilator-days, with mortality at 70%. Our VAP prevalence in the pre-intervention group was of 8.9%, lower than in similar high-complexity hospitals, like that reported in Cúcuta, during the period between 2013 and 2016, during which data was analyzed from 69 patients with inclusion conditions similar to this study, finding that, with the same diagnostic criteria, late VAP presence was of 42%.[7]

Prevalence of VAP was also lower than in the study by Ortiz *et al.*, who conducted a prospective cohort study in 39 ICU from eight cities in Colombia, from 2007 to 2009, identifying and classifying VAP according to CDC criteria.[20] That study included 31622 patients, in which were diagnose 1944 episodes of device-associated infection, of which 858 corresponded to VAP (44.1%); this multicenter study found a rate of 7.4 cases per 1000 days/ventilator for 2010.

As limitations to identify an effect with statistical significance, it should be noted that reduced sample size could affect the complete and ideal convergence of the final model, as well as the regression coefficients and, hence, the association measurement (IRR) calculated via Poisson's regression.[21] Besides, the VAP incidence was relatively low *per se*, therefore, there may be residual variance not explained by the effect of the variables included in the model. As limitations of the study, the following are recognized: a) the failure to isolate the germs through cultures of tracheal secretions, which did not allow comparing the microbiota distribution of early and late VAP, as done in other studies in the country, b) the limited sample size that subtracts statistical significance from the findings, and c) it was not possible to verify on the field all the variables, beyond the clinical record especially of care and oral health characteristics by the nursing staff. It is possible that observations by the staff condition the effort of conducting adequate care, but without this supervision the mere record does not transcend (Hawthorne effect). All these biases could have been controlled through a clinical trial, however, due to ethical considerations that did not allow randomization of patients nor allocation of treatment arms, there were no feasibility conditions to carry out this type of study.

It should be highlighted that the findings herein are complemented with observations during the field work phase, which evidenced commitment by the nursing staff during the strategy implementation phase, who attended all training sessions and the results demonstrate they placed into practice, during the study execution period, everything learnt during said training. This information is also relevant, to the extent that it evidences existence of the commitment by the staff and disposition to carry out health interventions derived from epidemiological studies, besides demonstrating that it is even possible to carry out experimental studies or with other types of designs in the future in the hospital, where collaboration from the care staff is fundamental.

Regarding differences in the conditions of both groups, some of these were statistically significant in the bivariate analysis between the pre and post groups, also possibly explaining, besides the effect of the intervention evaluated, reduction of VAP

between one and another group. Thus, our findings agree with Hairani *et al*.,[22] who demonstrated that inadequate acute kidney function (included in the SOFA score) is associated with prolonged intubation time and with VAP ($p < 0.01$). Younan *et al*.,[23] also confirmed this association ($p < 0.001$), although of greater relevance within the context of traumatized patients.

Furthermore, variables related with oral care occurred with greater prevalence in the group intervened: oral and dental care one or more times per day, increased tooth brushing, and use of chlorhexidine and oral antiseptics, as well the increase of nursing staff that participate in caring and increase in the number of daily aspirations of secretions. As in a quasi-experimental study conducted with 71 nurses in Malaysia, which compared knowledge and activities destined for prevention before and after receiving training on VAP (before the intervention: 63.17 ± 9.34; after the intervention: 95.99 ± 4.68; $p < 0.001$) and which compared the incidence of VAP, before 22 cases from 101 patients and after seven cases from 110 patients, evidencing that training of the health staff in oral care influences in increasing oral care practices in patients and managing to reduce VAP incidence.[24]

Educational programs addressing oral care can improve the quality of the care provided by the nursing staff; the American Association of Critical Care Nurses states that oral health is a basic requisite of the nursing practice, which is why it is necessary to implement protocols that guide care, as well as training programs.[25] Prevention interventions in oral health must be constant in ICU, bearing in mind that these contribute to diminishing inflammatory, infectious, and painful problems. Odontologists must be part of this multidisciplinary team with adaptation of treatments and guidance to the health staff. Thus, it becomes necessary to implement educational and adaptation actions aimed at the nursing staff, to provide higher quality and professional integrity with critical patients, as well as humanization of actions aimed at promoting oral health.

It is recommended to implement continuous training interventions in nursing care aimed at reducing complications and increasing the quality of care, construct guides and protocols with packages of VAP prevention measures, besides using follow-up tools that will permit evaluating the care procedures. The work highlights the need to generate multidisciplinary actions applied to the daily practice, with participation by the odontologist in hospital settings, evaluation, and critical patient care, aimed at the diagnosis and protocolized treatment of oral pathology, as well as support to the care staff, which contributes with adapting treatments and guiding oral care.

Conclusion. The intervention seems useful (reduces incidence rate up to 65% when adjusting for multiple co-factors); however, no statistical evidence supports this finding and evidence exists that the staff that conducts oral care in patients is highly adherent to recommendations related with the intervention proposed

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Daily lives of university students in the health area during the beginning of the Covid-19 pandemic in Brazil

Original article

Luciana Regina Ferreira da Mata[1]
https://orcid.org/0000-0002-5080-4643

Juliana Dias Reis Pessalacia[2,7]
https://orcid.org/0000-0003-0468-2283

Tatiane Prette Kuznier[3]
https://orcid.org/0000-0002-1120-7723

Priscila Kelly da Silva Neto[4]
https://orcid.org/0000-0002-0553-2714

Caroline de Castro Moura[5]
https://orcid.org/0000-0003-1224-7177

Fernando Ribeiro dos Santos[6]
https://orcid.org/0000-0002-8913-5205

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Daily lives of university students in the health area during the beginning of the Covid-19 pandemic in Brazil

Abstract

Objective. To determine the main changes that took place in the daily lives of students in the health area during the beginning of the Covid-19 pandemic in Brazil. **Method.** This is a cross-sectional study, carried out from May to June 2020, with 1786 students over 18 years old, regularly enrolled in health courses at higher education institutions in five regions of Brazil. Sampling was by convenience, typified as snowball. In order to collect data, an instrument to describe the sociodemographic profile and the daily lives of students during the pandemic period was used, which was applied via a digital platform on the web. **Results.** The main changes that took place in the daily lives of academic students in the health area in the face of the Covid-19 pandemic in Brazil are related to lower productivity; difficulty concentrating; increased hours of sleep, use of electro-electronic equipment

1 Nurse, Ph.D. Associate Teacher. Federal University of Minas Gerais, Brazil. Email: lucianamata@ufmg.br (Corresponding author).
2 Nurse, Ph.D. Associate Teacher. Federal University of Mato Grosso do Sul, Brazil. Email: juliana.pessalacia@ufms.br
3 Nurse, Ph.D. Adjunct Teacher. Federal University of Paraná, Brazil. Email: tatianeprette@gmail.com
4 Nurse, Master's Student. State Department of Health of Mato Grosso do Sul, Brazil. Email: priscila.baldonado@gmail.com
5 Nurse, Ph.D. Adjunct Teacher. Federal University of Viçosa, Brazil. Email: caroline.d.moura@ufv.br
6 Undergraduate Medical Student. Federal University of Mato Grosso do Sul, Brazil. Email: fernanndoribeiro@hotmail.com

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and weight; poorer quality of food; higher consumption of food, legal and illegal substances and medications (mainly analgesics, anxiolytics and antidepressants); less interest in personal appearance; and greater contact with relatives. Regarding emotional changes, it should be underlined the complaints of anxiety, stress, anguish, confusion, helplessness and depression. **Conclusion.** During the beginning of the Covid-19 pandemic in Brazil, the students in the health area experienced several changes in their daily lives, which deserve special attention from higher education institutions and health systems, envisioning interventions to minimize health risks to this population.

Descriptors: COVID-19; students, health occupations; higher education institutions.

La vida cotidiana de los estudiantes universitarios del área de la salud durante el inicio de la pandemia de COVID-19 en Brasil

Resumen

Objetivo. Determinar los principales cambios ocurridos en la vida cotidiana de los estudiantes del área de la salud durante el inicio de la pandemia de COVID-19 en Brasil**. Métodos.** Estudio transversal realizado a 1786 estudiantes mayores de 18 años, regularmente matriculados en cursos del área de la salud en instituciones de enseñanza superior en cinco regiones de Brasil. El muestreo fue por conveniencia del tipo bola de nieve. Para la recolección de datos se utilizó un instrumento para describir el perfil sociodemográfico y la rutina de los estudiantes al inicio del periodo de la pandemia, el cual se aplicó a partir de una plataforma digital en la web. **Resultados.** Los principales cambios ocurridos diariamente están relacionados con la menor productividad; la dificultad de concentración, el aumento en las horas de sueño, del peso y el uso de dispositivos electrónicos, la inadecuada alimentación, el mayor consumo de alimentos, el uso sustancias lícitas e ilícitas y medicamentos (principalmente analgésicos, ansiolíticos y antidepresivos), el menor interés por la apariencia personal y el menor contacto con los familiares. En cuanto a los cambios emocionales, se presentó en mayor medida ansiedad, estrés, angustia, confusión, impotencia y depresión**. Conclusión.** Los estudiantes de salud durante el inicio de la pandemia de COVID-19 en Brasil experimentaron varios cambios en su vida cotidiana, que merecen una atención especial por parte de las instituciones de

educación superior y los sistemas de salud, con el objetivo de realizar intervenciones para minimizar los riesgos para la salud de esta población.

Descriptores: COVID-19; estudiantes del área de la salud; instituciones de enseñanza superior.

Quotidiano de estudantes universitários da área da saúde durante o início da pandemia da Covid-19 no Brasil

Resumo

Objetivo. Determinar as principais mudanças ocorridas no quotidiano de estudantes da área de saúde durante o início da pandemia da Covid-19 no Brasil. **Métodos.** Estudo transversal, realizado no período de maio a junho de 2020 com 1786 estudantes com mais de 18 anos, regularmente matriculados em cursos da área da saúde em instituições de nível superior de cinco regiões do Brasil. A amostragem foi por conveniência, do tipo bola de neve. Para coleta de dados, utilizou-se um instrumento para descrever o perfil sociodemográfico e a rotina dos estudantes durante o período de pandemia, que foi aplicado via plataforma digital na web. **Resultados.** As principais mudanças ocorridas no quotidiano dos acadêmicos da área da saúde frente à pandemia da Covid-19 no Brasil estão relacionadas à menor produtividade; dificuldade de concentração; aumento de horas de sono, do peso, de uso de equipamentos eletroeletrônicos; pior qualidade da alimentação; maior consumo de alimentos, substâncias lícitas e ilícitas e medicamentos (principalmente analgésicos, ansiolíticos e antidepressivos); menor interesse pela aparência pessoal; e maior contato com familiares. Em relação às alterações emocionais, destacam-se maiores queixas de ansiedade, estresse, angústia, confusão, impotência e depressão. **Conclusão.** Os estudantes da área de saúde durante o início da pandemia da Covid-19 no Brasil vivenciaram diversas mudanças no quotidiano, as quais merecem atenção especial por parte das instituições de ensino superior e dos sistemas de saúde, vislumbrando-se intervenções para minimizar os riscos à saúde desta população

Descritores: COVID-19; pandemias; estudantes de ciências da saúde; instituições de ensino superior

Introduction

Everyday life refers to the way of life of people and the community, being represented by interactions, values, beliefs, symbols and images that outline the way of living healthy or acquiring diseases.[1] In the context of the Coronavirus Disease 2019 (COVID-19) pandemic, the daily lives of university students changed after the interruption of face-to-face activities by 91% of them around the world.[2] Considering non-pandemic periods, entering university already brings psychological implications for students. It is a period of formation of new relationship cycles, with people from different contexts and social experiences. The academic trajectory is permeated with different challenges related to the involvement with a new learning universe, which requires skills and competencies not yet experienced, which may trigger anxiety and insecurity.[3]

During the COVID-19 pandemic, the daily lives and usual interactions of students were impacted by social distancing measures as a strategy to control the spread of the Coronavirus.[4] Nevertheless, such changes have generated emotional impacts across the entire population.[5] In the academic context, face-to-face classes have been replaced by classes in digital media, based on Information and Communication Technologies (ICTs).[2] In this sense, the integrity of the curricular program has become vulnerable to the consequences imposed by COVID-19, since, in health courses, clinical practice is a central element in training. In addition, the lack of psychological support, the work overload of teachers and students, the lack of quality in teaching resulting from the absence of planning of activities by ICTs and access to these technologies have impacted daily life and genetared dissatisfaction in students during the pandemic period.[2]

In this context, changes in the daily lives of university students can generate biopsychosocial alterations that affect their health. Therefore, studies that seek to investigate new routines and modes of interaction of students in the health area become relevant, in a scenario unknown to the population.

Accordingly, this study has the objective of knowing and analyzing what were the main changes that took place in the daily lives of academic students in the health area during the beginning of the period of the COVID-19 pandemic in Brazil, in order to understand the impacts of the pandemic on the biopsychosocial aspects of these individuals.

Methods

Quantitative, cross-sectional and descriptive study. Data collection was conducted from May 19, 2020 to June 3, 2020, which characterizes the early period of the pandemic in Brazil. This study was attended by 1786 students enrolled in the health area courses in higher education institutions in the five regions of Brazil. Inclusion criteria were: being over 18 years old and regularly enrolled in a health course. Participants who did not live in the country or who mentioned they had dropped out before the pandemic began were excluded. Sampling was by convenience, typified as snowball, since the researchers asked the participants to forward the link or the reference of potential participants who met the inclusion criteria.

The data collection instrument was designed by the researchers based on two literatures that supported the definition of variables related to the investigation of the sociodemographic profile and the routine of students during the pandemic period.[6,7] Therefore, the following variables were included: gender; age range; region of residence in the country; nature of the educational institution (if public or private); course; period; shift; practice of social distancing; sleep patterns, productivity, mood and diet during the pandemic period; changes in weight and interest in personal appearance; family and social interaction; changes in the pattern of use of licit and/or illicit substances; and emotional changes resulting from the pandemic period of COVID-19.

The instrument was evaluated regarding the content and organization of the items that composed each question by five nurse teachers, PhDs in nursing, two specialists in the area of mental health and three in the area of adult health. After the suggested adjustments, the instrument with 15 questions was inserted into *Google Forms*®, a digital platform available for free on the web. In order to collect data, the link to access the instrument along with the free and informed consent form was sent to the participants via email and/or *Whatsapp*®. The average time of completion was seven minutes. The data were exported to *Microsoft Excel*®, version 2013, for organization and coding of variables. In order to perform the descriptive analysis, the *Statistical Package for the Social Sciences* (SPSS) statistical software, version 20, was used. Each item of the instrument was processed as a categorical variable and the results were presented as absolute and relative frequencies.

The study was approved by an ethics committee for research with human beings (CAAE nº 31550820.0.0000.5620/Opinion Number: 4.021.458), which followed the recommendations of Resolution 466/2012 of the National Health Council.[8]

Results

Of the 1786 students who took part in this study, 83.6% were female. Most were between 18 and 22 years old and lived in the Southeast region of the country (Table 1).

Regarding the institution, 63.7% of the students attended a public university; and 54.2% studied nursing. In addition, 69% were in the early cycle of the course (from the first to the third year). Concerning the shift, 65.4% studied full-time.

Table 1. General characteristics of the study sample (*n*=1786)

Variables	*n*	%
Gender		
Female	1493	83.6
Male	293	16.4
Age range in years		
18-22	1128	63.2
23-27	439	24.5
28-32	107	6.0
>33	112	6.3
Region of residence		
Southeast	804	45.0
South	490	27.4
Midwest	280	15.7
Northeast	150	8.4
North	62	3.5
Type of university		
Public	1137	63.7
Private	649	36.3
Courses		
Nursing	968	54.5
Medicine	368	20.7
Pharmacy	124	7.0
Nutrition	86	4.8
Dentistry	51	2.9
Physiotherapy	42	2.4
Biomedicine	38	2.1
Biochemistry	32	1.8
Occupational Therapy	20	1.1
Others	48	2,7
Shift		
Full-time	1168	65.4
Evening	345	19.3
Morning	258	14.4
Afternoon	15	0.8

It was also found that 93.6% of the students reported that they were practicing social distancing. However, 76.7% had difficulty in complying with it. As for sleep patterns, 90.8% of the students reported that they had changed, with 79.5% sleeping more. A change in activity patterns was also observed in 94.4% of the students, with 73.3% reporting lower productivity (Table 2).

Regarding the practice of leisure activities, only 1.8% of the participants stated that there was no change, and most of them started to use the internet more and watch more television/movies. The dietary patterns and weight of these students also changed in this early period of the COVID-19 pandemic, as 87.0% reported that the quality of diet worsened and 46.5% reported increased body weight. Students also perceived changes in interest in personal appearance, so that 70.8% reported taking less care of their appearance (Table 2).

Table 2. Routine of social distancing, changes in sleep patterns, activity, leisure, diet, body weight and interest in personal appearance of the 1786 students during the early period of the Coronavirus pandemic

Variables	*n*	%
Routine of social distancing*		
Change in routine	1740	97.4
Leaves home to go shopping	1340	75.0
Isolated without leaving home	524	29.3
Leaves home to work	323	18.1
Leaves home to practice physical and/or leisure activities	138	7.7
Leaves home to practice voluntary actions	79	4.4
Changes in sleep patterns		
Sleep more	1420	79.5
Sleep less	202	11.3
Without changes	164	9.2
Changes in activity patterns*		
Lower productivity	1310	73.3
Less mood	899	53.3
Difficulty concentrating	787	46.7
Without changes	100	5.6

Table 2. Routine of social distancing, changes in sleep patterns, activity, leisure, diet, body weight and interest in personal appearance of the 1786 students during the early period of the Coronavirus pandemic (Cont)

Variables	*n*	%
Leisure activities*		
Internet/Social networks	1477	82.7
Television/Movies	1249	69.9
Music	806	45.1
Cooking	691	38.7
Reading	570	31.9
Electronic/online games	384	21.5
Photo production/editing	253	14.2
Contact with friends/relatives	160	9.0
Video production	122	6.8
Without changes	33	1.8
Changes in dietary patterns*		
Quality of food has worsened	1553	87.0
Need to eat more often	1048	58.7
Without changes	307	17.2
Changes in body weight		
Weight gain	831	46.5
Weight reduction	228	12.8
Kept the usual weight	484	27.1
Did not know how to inform	243	13.6
Interest in personal appearance		
Take less care of my appearance in general	1265	70.8
Keep the same routine	521	29.2

* The participant may have marked more than one answer option.

Table 3 presents information about family and social interaction during the pandemic period. It can be seen that most students stayed close to their relatives.

Table 3. Family and social interaction of the 1786 students during the early stage of the Coronavirus pandemic

Variables	*n*	%
Family interaction		
Without changes	333	18.6
Closer to family, and the relationship is the same	652	36.5
Closer to family, and the relationship has improved	334	18.7
Closer to family, and the relationship has worsened	231	12.9
Physically distant from family, and the relationship is the same	181	10.1
Physically distant from family, and the relationship has improved	32	1.8
Physically distant from family, and the relationship has worsened	23	1.3
Social interaction*		
Increased contact with relatives	1320	73.9
Increased contact with friends	1153	64.6
Religious/spiritual practices	318	17.8
Volunteer actions	101	5.7

* The participant may have marked more than one answer option.

Changes in the pattern of consumption of licit and/or illicit substances were also observed. A percentage of 65.5% of the students did not use these substances; however, an increase of 19% was observed in the consumption of alcohol, 5.1% in the consumption of cigarettes, and 2.3% in the consumption of illegal drugs. Moreover, an increase was observed in the consumption of drugs according to medical prescription (7.8%) and on their own (7.2%), especially anxiolytics (11.7%), analgesics (11.5%) and antidepressants (11.2%). Finally, Table 3 presents the emotional changes that took place in students during the pandemic period.

Table 4. Emotional changes arising from the Coronavirus pandemic period (n=1786)

Variables*	*n*	%
Anxiety	1241	69.5
Stress	1139	63.8
Anguish	1079	60.4
Confusion	945	52.9
Helplessness	879	49.2
Depression	700	39.2
Without perspective on the future	396	22.2
Desire to take one's own life	170	9.5

* The participant may have marked more than one answer option.

Discussion

From the analysis of the daily life of health academic students during the early period of the COVID-19 pandemic in Brazil, the main changes/effects observed in the routine of the surveyed students were: social distancing and the difficulty in complying with it; increased sleep time; lower productivity, less mood and difficulty concentrating; increased use of the internet and television/movies; increased consumption of low-quality food; less care with appearance; increased contact and interaction with relatives; increased consumption of alcohol and medications, mainly, anxiolytics, analgesics and antidepressants; and increased sensations of anxiety, stress, anguish, confusion, helplessness and depression.

The analysis of the changes in the daily lives of students indicates that the social distancing measures and the remote teaching implemented in Brazilian Higher Education Institutions (HEIs) impacted on different biopsychosocial aspects of these students, which deserve more attention from managers in the formulation of policies and measures aimed to minimize the risks to the physical and emotional health of academic students. Most students reported adherence to the practice of social distancing; however, they pointed out difficulties in complying with it. A study[9] found that the difficulties in complying with social distancing are associated with the social position, the function and the work performed, which, in turn, define the living conditions of the population.[10] The quality of information, the credibility of government officials and the uncertainty about the virus are also factors that impact on adherence to social distancing.[10]

Most students reported a change in sleep patterns, with reports of increased hours of sleep. Research[11] conducted in Greece with university students in the midst of the COVID-19 pandemic found that the amount of sleep time increased, but that sleep quality worsened. Scholars point out that worsening sleep quality is due to subjective sleep quality, latency, duration, efficiency, sleep disturbances, sleep medication use and daytime dysfunction.[12] A survey[12] conducted with college students in China found that the severity of the COVID-19 outbreak can significantly increase people's negative emotions and, consequently, decline in sleep quality. Also in China, among 939 individuals evaluated, sleep disturbances

increased significantly in people aged 18 to 24 years, with 36.43% of participants reporting severely compromised sleep quality.[13]

In the present study, changes in the activity patterns were also highlighted, with reports of lower productivity, less mood and difficulty concentrating. Among Saudi Arabian medical students, difficulty concentrating and lower productivity during the quarantine period were also evidenced.[14] With regard to leisure habits, most students reported more time spent on the internet, social networks and television/movies. They also stated that they had increased the frequency of reading during the pandemic period. Research[15] conducted in Africa with 678 individuals aged 14 to 74 years evaluated the psychological impact of confinement linked to the COVID-19 epidemic and found that respondents made use of the Internet several hours a day, with greater interest in social media content such as *Facebook*, *Twitter* and *YouTube*. In fact, as a result of the COVID-19 pandemic, daily activities such as work and education started to be carried out online,[5] which intensified contact by digital means compared to the pre-pandemic period.[16]

Another relevant finding was in relation to the quality of the diet of these students, which showed increased consumption of food products with poor nutritional quality and increased body weight. A survey[17] involving 1097 adults in Poland, conducted during the early period of the pandemic with the objective of evaluating the nutritional and consumption habits, indicated that most participants started to eat more, and these trends were more frequent in overweight and obese individuals, respectively. Increased Body Mass Index (BMI) was associated with less frequent consumption of vegetables, fruits and legumes and higher consumption of meat, dairy and fast food.[17] In Australia,[18] the effects of social distancing measures on the dietary patterns of university students during the early phase of the COVID-19 pandemic were evaluated; and, among women, caloric intake was 20% higher. The frequency of snacks and energy density of these students increased during the pandemic when compared to the food consumption of the same population in the years 2018 and 2019. The longer time spent at home can encourage the consumption of high-calorie diets, with the increase in the number and meal portions.[18]

Students in the present study also reported changes in interest in personal appearance, so that most reported taking less care of their appearance. No studies with similar results were identified. Nevertheless, it is known that the increased use of videoconferencing technologies in the context of social distancing may indirectly contribute to increased concern with personal appearance. The current requirement for online self-image publications is shown to be detrimental to body image and mood in this population. The analysis of the effects of observing one's own image during a conversation using digital technologies becomes an area of interest to be investigated.[19]

With regard to family and social interaction during the pandemic period, it is noted that most students became closer to their relatives. The physical closeness between people who live together may increase during the period of social distancing, specifically the time spent with children, partners, parents or siblings. This may have led to closer ties and the possibility of more quality time, which may strengthen some relationships, with increased complicity and emotional closeness. However, for others, there may be an emotional distancing, since this situation may exacerbate latent family conflicts, potentially aggravated by financial imbalances, unemployment or fear of losing a job.[16] In this sense, in Saudi Arabia, students admitted greater emotional detachment from family, partners and friends during the period of social distancing.[14]

In this study, it was observed changes in the pattern of consumption of legal and/or illegal substances, where, although the majority did not use these substances, among the participants

who said they did, there was an increase in the consumption of alcohol, cigarettes, illegal drugs, self-medication, especially anxiolytics, analgesics and antidepressants. In a survey[20] that included 939 university students from Russia and Belarus, rates of substance use increased from the month before the pandemic, with increased use of tobacco, alcohol, marijuana, ritalin or similar substance, analgesics and sedatives. Russian and Belarusian students in quarantine had a significantly higher rate of alcohol use than those not restricted.[20] In Poland, researchers highlighted increased an alcohol consumption in adults and an increased frequency of smoking during the quarantine period.[17]

It was also noted that participants reported a greater propensity to negative emotional changes, such as anxiety, stress, depression and suicidal thoughts, which impacts their mental health. Studies conducted in Portugal,[9] Greece,[11] Saudi Arabia,[14] and China[21,22] showed an increase in depressive symptoms in university students during the pandemic period. There was an increase in symptoms related to anxiety [6,11,12,21,22] stress or post-traumatic stress disorder,[6,21] as well as an increase in suicidal thoughts.[11] Reception of negative information about the pandemic makes students more prone to anxiety symptoms and mild depression.[21] It is recommended greater involvement of relatives, friends and teachers to help them face negative emotions and difficulties with positive attitudes and increased social support.[21]

Lack of masks, alcohol and other products relevant to virus prevention and control have also been highlighted as factors related to increased concern on the part of students about the threat to life and health posed by COVID-19, which potentiates overall psychological distress and somatic symptoms.[22] In China, an investigation conducted with 805 undergraduate students identified that increased symptoms affecting the mental health of these students are associated with doubts about the potential negative impact that this period could have on academic progress.[4]

The limitation of this study is the selection of participants by the convenience sampling method, which generated a distribution of a larger number of participants from the Southeast region of Brazil, which does not guarantee the representativeness of the results for the entire Brazilian population. Another limitation was the non-use of a validated instrument for data collection, since there was no instrument in the literature that met the study objectives. Nevertheless, in order to minimize biases related to the reliability and validity of the instrument, it was submitted to the evaluation of five teachers with experience in the topic.

Conclusion: The main changes that took place in the daily lives of health academic students facing the COVID-19 pandemic in Brazil are related to lower productivity; difficulty concentrating; increased hours of sleep, use of electro-electronic equipment and weight; poorer quality of food; higher consumption of food, legal and illegal substances, as well as medications (mainly analgesics, anxiolytics and antidepressants); less interest in personal appearance; and greater contact with relatives. Regarding emotional changes, it should be underlined the complaints of anxiety, stress, anguish, confusion, helplessness and depression. Such changes deserve special attention from HEIs and health systems, in order to direct interventions to minimize health risks to this population.

It is emphasized the importance of new studies that also aim to evaluate the daily lives of students at different times of the pandemic, in order to broaden the discussion about changes and maintenance of these behaviors among students. Such discussions will foster interventional studies with actions aimed to minimize the impacts of epidemic periods on the daily lives of students.

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Randomized Controlled Trial Study of the Impact of a Spiritual Intervention on Hope and Spiritual Well-Being of Persons with Cancer

Ardashir Afrasiabifar[1,5]
https://orcid.org/0000-0001-5272-6012
Asadollah Mosavi[2,5]
https://orcid.org/0000-0002-7792-7379
Abolfazl Taghipour Jahromi[3,5]
https://orcid.org/0000-0003-3906-2922
Nazafarin Hosseini[4,5]
https://orcid.org/0000-0001-7471-7475

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A Randomized Controlled Trial Study of the Impact of a Spiritual Intervention on Hope and Spiritual Well-Being of Persons with Cancer

Abstract

Objective. To determine the impact of spiritual intervention on hope and spiritual well-being of persons with cancer. **Methods.** Randomized controlled trial in which 74 patients with cancer referring to a chemotherapy ward of Shahid Rajaie Hospital in Yasuj city, Iran, were participated. The eligible patients were randomly assigned to either intervention or control group. Spiritual-based intervention was performed based on the protocol in four main fields namely; religious, existence, emotional and social over 5 sessions before chemotherapy. The participants in the control group had received usual cares. Data were collected using Snyder's Hope Scale and Ellison's Scale Spiritual Well-Being Scale on a week before and after intervention. **Results.** The total mean scores of the scales of hope and spiritual well-being in both groups did not

1 Professor, Ph.D.
Email: afrasiabifar.ardashir@yums.ac.ir
2 Nurse Instructor, M.Sc.
Email: mosaviasadolah@yahoo.com.
Corresponding author.
3 Nurse, M.Sc. Email: ataghpour38@gmail.com
4 Associate Professor, Ph.D.
Email: hosseinichenar@yahoo.com
5 School of Nursing, Yasuj University of Medical Sciences, Yasuj, Iran

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present statistical differences in the pre-intervention assessment. In contrast, at the post assessment, significant differences ($p<0.001$) were found in the mean scores between the intervention and control groups on the hope scale (60.9 versus 39.8) and on the spiritual well-being scale (94.3 versus 71.6). **Conclusion.** Spiritual intervention could promote hope and spiritual well-being of persons with cancer.

Descriptors: patiens; neoplasms; hope; spirituality.

Ensayo controlado aleatorio sobre el impacto de una intervención espiritual en la esperanza y el bienestar espiritual de los personas con cáncer

Resumen

Objetivo. Determinar el impacto de una intervención espiritual en la esperanza y el bienestar espiritual de las personas con cáncer. **Métodos.** Ensayo controlado aleatorio en el que participaron 74 pacientes con cáncer que acudieron a una sala de quimioterapia del Hospital Shahid Rajaie de la ciudad de Yasuj (Irán). Los pacientes elegibles se asignaron aleatoriamente al grupo de intervención o al de control. Durante 5 sesiones, y antes de la quimioterapia, se llevó a cabo una intervención espiritual basada en un protocolo con cuatro campos principales: religioso, existencia, emocional y social. Los participantes en el grupo control recibieron el cuidado usual. Los datos se recogieron mediante la aplicación de la escala de esperanza de Snyder, una semana antes y una semana después de la intervención, y de la escala de bienestar espiritual de Ellison. **Resultados.** Las puntuaciones medias de las escalas de esperanza y bienestar espiritual en ambos grupos no presentaron diferencias estadísticas en la evaluación pre-intervención. En cambio, en la evaluación posterior, se encontraron diferencias significativas ($p<0.001$) en las puntaciones medias entre los grupos de intervención y de control en la escala de esperanza (60.9 frente a 39.8) y en la escala de bienestar espiritual

(94.3 frente a 71.6). **Conclusión.** La intervención espiritual podría promover la esperanza y el bienestar espiritual de las personas con cáncer.

Descriptores: pacientes; neoplasias; esperanza; espiritualidad.

Ensaio controlado aleatório sobre o impacto de uma intervenção espiritual na esperança e no bem-estar espiritual de pessoas com câncer

Resumo

Objetivo. Determinar o impacto de uma intervenção espiritual na esperança e no bem-estar espiritual das pessoas com câncer. **Métodos.** Ensaio controlado aleatório envolvendo 74 pacientes com câncer que frequentaram uma sala de quimioterapia no Hospital Shahid Rajaie na cidade de Yasuj (Irã). Os pacientes elegíveis foram aleatoriamente designados para o grupo de intervenção ou controle. Durante 5 sessões, e antes da quimioterapia, foi realizada uma intervenção espiritual baseada em um protocolo com quatro campos principais: religioso, existencial, emocional e social. Os participantes do grupo controle receberam os cuidados habituais. Os dados foram coletados por meio da aplicação da Escala de Esperança de Snyder e da Escala de Bem-Estar Espiritual de Ellison uma semana antes e uma semana após a intervenção. **Resultados.** Os escores médios das escalas de esperança e bem-estar espiritual em ambos os grupos não apresentaram diferenças estatísticas na avaliação pré-intervenção. Por outro lado, na avaliação subsequente, foram encontradas diferenças significativas (p <0.001) nas pontuações médias entre os grupos intervenção e controle na escala de esperança (60.9 vs. 39.8) e na escala de bem-estar espiritual (94.3 vs. 71.6). **Conclusão.** A intervenção espiritual pode promover esperança e bem-estar espiritual para pessoas com câncer.

Descritores: patients; neoplasias; esperança; espiritualidade.

Introduction

The diagnosis of cancer is considered as a crisis by patients and their families in the most times.[1] In addition, the effect of cancer on patients' physical and psychosocial health,[2] cancer may reduce their life expectancy due to re-hospitalization and complications of treatment.[3] Re-hospitalization is sometimes accompanied by unsuccessful treatment, reduced physical, psychological and spiritual well-being. It may also lead to lack of the patient's ability to find meaning of life,[4] to be hopefulness and spiritual distress.[5] The results of a study indicated that patients with cancer need supports to overcome fear (57%), hope (58%), meaningful life (50%), and negotiation regarding to dying and death (29%).[1] Review of literatures also shows contradictory findings about the effects of religious and spiritual interventions. The results of some studies have shown positive effects such as; better tolerance of disease,[6] better adherence to therapeutic regimes,[7] improved self-esteem,[8] lower depression and anxiety,[9] and more hope of life[10] following religious or spiritual interventions. On contrast, some studies have reported negative consequences such as anger toward God, anxiety and depression[11] and even thoughts of suicide.[12]

Moreover, patients with cancer want to meet their spiritual needs which may not be necessarily religious needs. Because the meaning and purpose of life is based on a belief system even in people who have no religious beliefs. [13] Studies show that patients increase their demands to meet spiritual needs while facing lethal diseases such as cancer.[14] Assessing spiritual needs and designing interventions based on spiritual needs results in effective adaptation, improved quality of life, and also better interaction with therapeutic plans.[15]

Despite these emphases, the available evidences suggest that holistic cares comprising all aspects of human existence such as physical, mental, social and spiritual aspects has not been considered and especially that patients with cancer had repeatedly reported unmet spiritual needs.[2] Furthermore, spiritual needs of patients with cancer were less considered in oncology wards due to the lack of professional understanding of such needs.[16] Oncologist nurses ought to identify spiritual needs of patients with cancer and meet them through qualified cares.[4] They have golden opportunities to provide spiritual care to patients in need. They can improve patients' spiritual well-being due therapeutic communication with them.[17] Patients with cancer need both physical cares and psychological support to cope with a wide range of challenges from the time of diagnosis to the course of treatment.[18] The main question of the present study was; whether the spiritual based intervention could improve spiritual well-being and hope in patients with cancer who were aware of their disease. Therefore, the present study aimed to examine the impact of spiritual-based intervention on hope and spiritual well-being in patients with cancer.

Methods

Design and Participants. This study is a randomized controlled trial research. The study population was patients with cancer referring to a single chemotherapy ward of Yasuj city, Iran, 2017-2018. One hundred and three patients were assessed for eligibility, however, 80 eligible patients were selected through non-random sampling method and then randomly assigned to one of the two groups of intervention (group A) or control (group B) using block randomization. At first, the groups of intervention and control was labeled with A and B letters, respectively. Next, two blocks namely; AB, BA was created based on the statistical factorial rule (2!: $2\times1=2$) since we had two groups in this study. Therefore. We had two participants in each block in which their arrangement differed from each other. We selected blocks from these two blocks using replacement random sampling until the participants of our study were completed. Eighty eligible participants were assigned to one of these two groups (forty participants in each group). However, 74 patients completed this study (4 patients died and 2 patients were reluctant to continue the study). (Diagram 1). The blocked random allocation was designed by the first author, however, participants' enrollment and assignment to one of the two groups was conducted by the second author of the article.

Inclusion and Exclusion Criteria. Final diagnosis of cancer, undergoing the chemotherapy, range of age: 20-70 years old, patient's awareness of diagnosis, low score of spiritual well-being and hope based on the applied scales and informed consent to participate were considered as the inclusion criteria of this study. Patient's unwillingness to participate in the study and unmet inclusion criteria were considered to be the exclusion criteria of this study.

Intervention. Spiritual intervention was implemented based on a proposed protocol by Bussing *et al.*[2] in four domains of religious (excellence), existence (meaning and purpose), emotional (relaxation) and social (communication). It was performed over five sessions before starting chemotherapy in the ward (Table 1). The duration of sessions varied from 30 to 50 minutes. The applied strategies in this intervention included interactive negotiation, mutual questioning and answering, short audio or video clips, book introduction, booklet, and expressing personal experience related to the above four domains. Intervention had been performed by the third author of this article who is a nurse with clinical experience working in oncology settings as well as with supporting of a spiritual counselor. The participants in the control group had received usual cares.

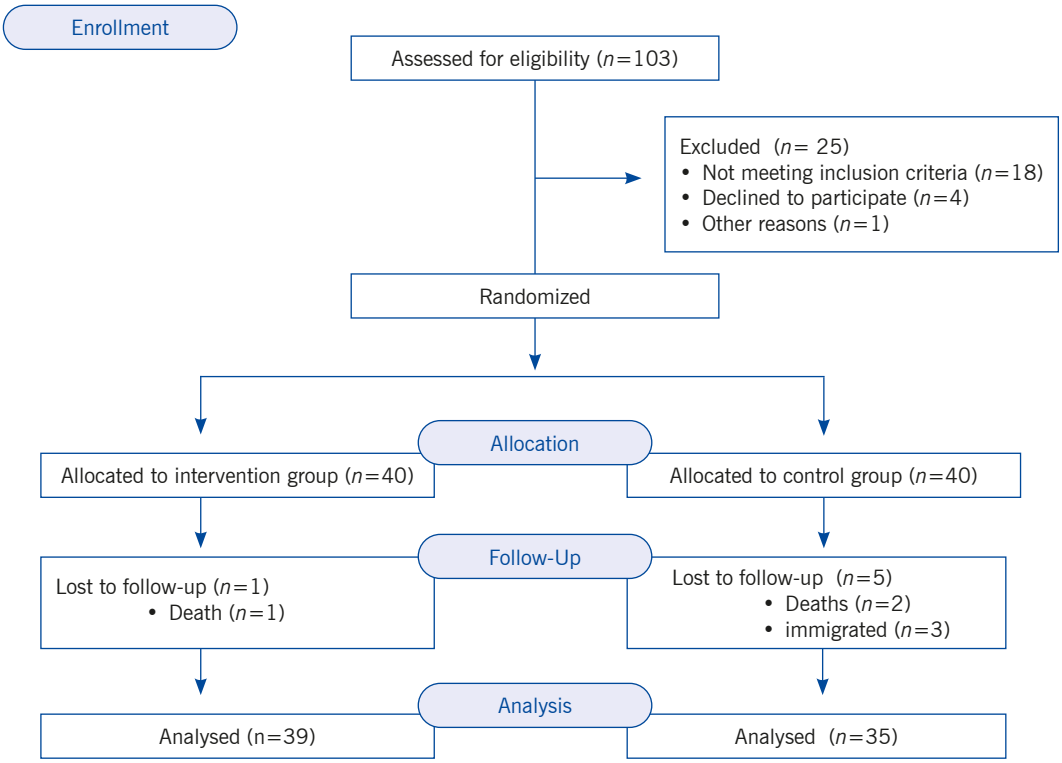

Diagram 1. Consolidated Standards of Reporting Trials (CONSORT) of the study

Table 1. Spiritual based Intervention Protocol

Session	Domain	Main theme	Spirituality-based care
First	Introduction	Patient's Preparation	Statement of goals and explanation about the intervention
Second	Religious	Excellence	Spiritual resources, relationship with God, Sanctities, Worship
Third	Existence	Meaning and purpose	Meaning of life, Self-Actualization, role function
Fourth	Emotional	Relaxation	Inner calmness, hope, balance, forgiveness, distress, fear
Fifth	Social	Communication	Love and sense of belonging, unity, relationship with spouse, family and friends

Outcome measure. Snyder's Hope Scale, and Paloutzian and Ellison's Spiritual Well-Being Scale (SWBS) were used to collect data. Although the Hope Scale consists of 12 items, however, four items are not included for data analysis due to their deviant nature. Two subscales of factor and strategy (4 questions for each subscale) with an eight- point Likert-type scoring of 1-8 are defined. A score of 1 means completely disagree and score 8 shows completely agree. The global score of hope ranges from 8 to 64. Higher scores represent better levels of hope. The validity and

reliability of the Hope Scale were approved in Persian.[19] The SWBS, with a six- point Likert-type scale of 1-6, was used to assess spiritual well-being. It has two subscales of religious and existential well-being (each of which with 10 items). A score of 1 shows completely disagree and score 6 represents completely agree. The scores of each subscale range from 10 to 60. The global score of spiritual well-being ranges from 20 to 120. The scores of spiritual well-being of 20-40 represent low spiritual well-being, scores of 41-99 show moderate spiritual well-being, and scores of 100-120 means high spiritual well-being. The psychometric properties of Persian version of the SWBS were approved.[20] We again checked its reliability using Cronbach's alpha that it was verified by our study and found a result of $\alpha = 0.78$.

Data Analysis. Data were collected at a week before intervention as baseline and a week post intervention. The collected data was analyzed using SPSS (Version 21) and through descriptive and inferential statistics such as Chi- square, and Fisher's Exact test for nominal variables. The results of independent samples *t* test and paired samples *t* test were reported for between and within group comparisons, respectively. Since the data distribution of the scores of outcome variables were normal. P values less than 0.05 were statistically considered significant differences.

Ethical Considerations. The informed consent was signed by the participants after explaining purpose of the study. We emphasized the confidentiality of collected data, the voluntary participation and also voluntary withdrawal at each stage of the study. The present study was approved by the Ethics Committee of Yasuj University of Medical Sciences (YUMS) with an ID code; IR.YUMS.REC.1396.137 and the registered number; IRCT20121208011692N2 by website of the Iranian Clinical Trial.

Results

In the present study, 39 (52.7%) of 74 patients with cancer were in the intervention group and 35 patients (47.3%) were in the control group. The patients had a mean age of 52.9 years (SD=18.1) with (Range; 20-68 years old) (Table 2). The results of the study related to the scale of hope shows that there was no significant difference in mean scores of hope between the two groups in the pre- intervention assessment. However, in the post- intervention, *Independent Samples t test* for between group comparison indicates significant differences ($p<0.001$) in global mean scores of hope and also subscales of factor and strategy for the patients in the intervention group compared with the patients in the control group (Table 3). In addition, mean differences for global scores of hope (13.7), and sub-scales of factor (6.6) and strategy (7.2) are observed for the patients in the intervention group. These mean differences were statistically significant based on the results of *Paired Samples t test* ($p<0.001$).

The results of the study related to the scale of spiritual well-being shows that there were no significant differences in mean scores of spiritual well-being between the two groups in the pre-intervention assessment. On contrast, our findings indicate significant differences for global mean scores of spiritual well-being and subscales of existence well-being, and religious well-being following spiritual intervention compared with the control group (table 4). The results of *Paired Samples t test* in within group comparison, presents statistical mean difference for global spiritual well-being (21.7), subscales of existential well-being (12.4) and religious well-being (9.2) for the patients in the intervention group, but no significant mean differences are observed for the patients in the control group.

Table 2. Participants' demographic characteristic by groups

Variables	Group	Intervention *n*=39	Control *n*=35	Total *n*=74	*p-value*
Age: Mean±SD		20.4 ±51.9	16.1 ±53.9	18.1±52.9	0.6
Duration of cancer diagnosis: Mean±SD		14.1±15.2	10.6±16.4	12.5±15.8	0.6
Duration of chemotherapy: Mean±SD		6.1±7.5	5.1±6.7	5.5±7.1	0.7
Sex: *n*(%)	Male	25 (64.1)	17 (48.6)	42 (56.7)	0.2
	Female	14 (35.9)	18(56.3)	32(43.3)	
Marital status *n* (%)	Single	2(5.1)	6 (17.1)	8 (10.8)	0.09
	Married	37 (94.9)	29(82.9)	66(89.2)	
Education n (%)	Primary	26 (66.7)	26(74.3)	52 (70.4)	0.08
	Secondary school	4 (10.3)	7 (20)	11 (14.8)	
	Diploma and higher	9 (23.1)	2 (5.7)	11(14.8)	

Table 3. Mean scores of hope in both the intervention and control groups

Group / Dimension / Time		Intervention Mean± SD	Control Mean± SD	*Independent Samples t test* Mean difference	*p-value*
Factor	Pre	3.1±23.7	2.21±20	3.7	0.1
	Post	1.34±30.3	2.4±19.8	10.5	0.001
Strategy	Pre	3.2 ±23.5	2.1±21.7	1.8	0.2
	Post	1.3±30.7	1.7±19.9	10.8	0.001
Global Hope	Pre	5.1±47.2	3.7 ±44.4	2.8	0.06
	Post	2.1 ±60.9	3.3±39.8	21.1	0.001

Table 4. Mean scores of spiritual well-being in both the intervention and control groups

Group / Dimension / Time		Intervention Mean± SD	Control Mean± SD	*Independent Samples t test* Mean difference	*p-value*
Religion health	Pre	39.8±9	36.4±2.6	3.4	0.06
	Post	49±1.3	36.7±2.3	12.3	0.001
Existential health	Pre	32.9±7	34.7±2.3	1.8	0.3
	Post	45.3±3.7	34.9±2.3	10.4	0.001
Global Spiritual Well-being	Pre	72.6±6.3	70.9±3.1	1.7	0.05
	Post	94.3±4.7	71.6±2.9	22.7	0.001

Discussion

According to the question of this study, the findings indicated that the spiritual- intervention improved spiritual well-being and hope in patients with cancer undergoing the chemotherapy. In other words, respond to spiritual needs led to positive changes in spiritual well-being and hopefulness.[21] The findings of this study is similar to published studies which have indicated benefits of social support,[22] quality of life,[23] patient's recovery,[7] and strengthened and facilitated interpersonal communication,[24] reduced symptoms and frustration[25] following spiritual or religious interventions. Finding of a qualitative survey by Zumstein-Shaha and colleagues showed that patients with cancer in struggling with disease often use religion/spirituality and rituals to find meaning.[26] Another correlational study has showed that cancer patients undergoing chemotherapy who had a high religious/spiritual coping score were found to have a higher level of hope.[27] The results of a study by Mansurifard and colleagues indicated spiritual health of adolescents with cancer was promoted following spiritual cares,[28] which is in line with our study. However, the findings of our study is not similar to a study by Kang and colleagues, in which meaning of life of adolescents with advanced cancer had been improved following logo therapy, however, no significant changes were observed for spiritual well-being in both the intervention and control groups.[29] A study by Delavari and Nasirian showed improved mental health and reduced anxiety in mothers of children with cancer following logo therapy.[30] On contrast, failure to provide spritual care is associated with spiritual distress, then increased healthcare costs, risk of depression and anxiety[31] which are important challenges to meet spiritual needs of patients with cancer.[32]

Despite reporting similar results in the mentioned studies, they also have methodological limitations that should be considered when comparing their results. Providing spiritual cares to patients with cancer is an interdisciplinary work including oncologists, oncology nurses, chaplains, psychologists and even patients with cancer and families. There is a fact that both patients with cancer search spiritual support such as hope, meaning, spiritual well-being interdisciplinary team agree that spiritual supports promote spiritual health of patients in oncology settings.[33] Assessing spiritual needs and recognize spiritual distresses of patients with cancer are key elements of holistic care.[34] Patients with cancer may experience spiritual distress due to uncertainty regarding prognosis and deteriorating health, cancer recurrence.[35] Indicators of hope and spiritual well-being are important in this regard.[36] Moreo er, spirituality is considered as an important predictor of emotional, functional, social well-being and quality of life of patients and families with cancer.[37]

Strength and Limitations. Randomized allocation is strength of this study. However, the current study has some limitations that caution in needed when generalizing its results. First, the current study was conducted in a single chemotherapy ward in which all participated patients were Muslims with same belief system. Thus, the participants did not have a diverse religious profile. Belief system may be used as strategy to cope with life-threatening diseases like cancer. Second, spirituality is a multidimensional and absolutely individual concept,[38] which may be associated with religion. [2] Religious people exhibit less spiritual distress due to higher psychosocial adaptation.[39] Patients with cancer may rely on religious issues as important adaptive resources due to the lethal nature of cancer.[40] The results of some studies have shown that patients' spiritual needs vary based on their religious beliefs; and patients without religious beliefs had lower levels of hope and well-being than patients with religious beliefs[41,42] Thus, future studies with designing different religious affiliations and ethnicity are suggested to better clinical judgment regarding the impacts of spiritual based interventions. More investigations eliciting patients' responses can

help to better understand influence of spirituality and religious on patients and their needs throughout the trajectory of a cancer diagnosis, treatment, and transition to end of life. In this ways, Spirituality interventions will be supported in clinical practice by evidence based nursing.

Conclusion. The present study indicated that the spiritual-based intervention could improve the spiritual well-being and hope in patients with cancer. The importance of providing spiritual interventions to meet cancer patients' spiritual needs such as hope and spiritual well-being is again highlighted by this study. Spiritual interventions as an important component of holistic care should be incorporated into the plan of nursing cares for both patients with cancer and families. Indicators such as spiritual well-being and hope are helpful to assess the effectiveness of these types of interventions in patients with cancer. Our study was a small research in a single chemotherapy, however, further investigations is needed in this area on cancer survivors, patients at the end of life as well as caregivers. Moreover, further research with different settings or the study populations with different sociocultural contexts may be useful to understand how spirituality affect patient to cope with cancer from at the point of diagnosis, treatment, disease progression and even facing with his/her own mortality.

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Original article

Portuguese validation of the Regret Intensity Scale (RIS-10) for measuring the intensity of regret associated with the provision of attention in health

Fabiana Rosa Neves Smiderle[1]
https://orcid.org/0000-0001-5624-6673

Valmin Ramos-Silva[2]
https://orcid.org/0000-0003-1574-0266.

Stela Maris de Jezus Castro[3]
https://orcid.org/0000-0001-5862-6709

Delphine Sophie Courvoisier[4]
https://orcid.org/0000-0002-1956-2607

Rita Mattiello[5]
https://orcid.org/0000-0002-0548-3342

Portuguese validation of the Regret Intensity Scale (RIS-10) for measuring the intensity of regret associated with the provision of attention in health

Abstract

Objective. The aim of the study was to adapt and validate the Regret Intensity Scale-10 (RIS-10) for Brazilian health professionals. **Methods.** The validation study took place in two phases, in which the first was the translation of the instruments and the second, the field validation using psychometric properties validity and reliability of the scale with 341 professionals (doctors, nurses and physiotherapists) linked to hospitals. Validity was assessed using content validities (six judges evaluation), criteria (correlation with the Life Satisfaction Scale - SWLS and Self-Reporting Questionnaire 20 -SRQ-20) and construct (exploratory analysis using the rotation method Promax, based on the slope graph and the Kaiser criterion and confirmatory using the structural equation model) after applying the questionnaire to professionals.Reliability was

1 Enfermeira. Doutora. Professora da Escola Superior de Ciências da Santa Casa de Misericórdia de Vitória, EMESCAM, Espírito Santo, Brazil. Email: fabiana.neves@emescam.br

2 Médico. Doutor. Professora. Escola Superior de Ciências da Santa Casa de Misericórdia de Vitória, EMESCAM, Espírito Santo, Brazil. Email: valmin.silva@gmail.com

3 Estatística. Doutora. Professora Universidade Federal do Rio Grande do Sul, Brazil. Email: stela.castro@ufrgs.br

4 Bioestatística. Doutora. Professora Hôpitaux Universitaires de Genève, Swiss. Email: delphine.courvoisier@hcuge.ch

5 Fisioterapeuta. Doutora. Professora Pontifícia Universidade Católica, Porto Alegre, Rio Grande do Sul, Brazil. Email: rita.mattiello@pucrs.br.Corresponding author

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measured by Cronbach's α coefficient and retest test over a maximum period of 30 days. Reproducibility was calculated by intraclass correlation. **Results.** A total of 341 professionals participated, with an average age of 38.6 ± 9.2 years. The content validity index (CVI) was 1.00, for all items of the scale in the proportion of agreement of the judges. Exploratory factor analysis showed a satisfactory correlation (Kaiser-Meyer-Olkin = 0.88), suggesting a two-factor model, which comprises the main components of the emotion of regret (Factor I – emoticons, Factor II - feelings), accounting for 64% of the total variation of the first factor. In the confirmation, the index standardized root mean squared residual = 0.063 was close to the acceptable and other values were below. The scale correlated positively with SRQ-20 ($p < 0.001$) and negatively with SLWS ($p = 0.003$). Reliability showed (Cronbach's α = 0.863) and test–retest reliability showed lower values than expected. The Bland-Altman graph showed a mean bias of -1.5 with lower and upper limits of 15.8 to 12.8 respectively. **Conclusion.** The RIS-10 adapted for the population performed adequately in the psychometric properties evaluated for the assessment of the intensity of regret related to the provision of health care.

Descriptors: emotions; health personnel; psychological adaptation; psychometrics; validation studies.

Validación al portugués de la Escala de Intensidad de Arrepentimiento (RIS-10) para medir la intensidad del arrepentimiento asociado a la prestación de atención en salud

Resumen

Objetivo. Adaptar y validar la Escala de Intensidad de Arrepentimiento-10 (RIS-10) para profesionales de la salud brasileños. **Métodos.** Este estudio de validación se realizó en dos fases: la primera fue la traducción de los instrumentos y la segunda, la validación de campo evaluando las propiedades psicométricas de validez y confiabilidad de la escala con 341 profesionales (médicos, enfermeras y fisioterapeutas) vinculados a hospitales. La validez se evaluó mediante la validez de contenido (evaluación de seis jueces), criterios (correlación con la Escala de Satisfacción de Vida - SWLS y *Self-Reporting Questionnaire* 20 -SRQ-20) y constructo (análisis exploratorio mediante el método de rotación Promax, basado en el gráfico de pendiente (Criterio de Kaiser y confirmatorio por el modelo de ecuación estructural) luego de aplicar el cuestionario a los profesionales. La confiabilidad se midió mediante el coeficiente α de Cronbach y la prueba de reprueba en un período máximo de 30 días. La reproducibilidad se calculó por correlación intraclase. **Resultados.** Participaron 341 profesionales, con una edad media de 38.6 ± 9.2 años. El índice de validez de contenido (IVC) fue de 1.00 para todos los ítems de la escala en proporción de acuerdo con los jueces. El análisis factorial exploratorio mostró una correlación satisfactoria (Kaiser-Meyer-Olkin = 0.88), sugiriendo un modelo de dos factores, que comprende los componentes principales de la emoción de arrepentimiento (Factor I - emociones, Factor II - sentimientos), correspondiente al 64% de la variación total del primer factor. Tras la confirmación, el índice cuadrático medio residual estandarizado = 0.063 estuvo cerca de ser aceptable

y los otros valores estaban por debajo. La escala se correlacionó positivamente con SRQ-20 ($p<0.001$) y negativamente con SLWS ($p = 0.003$). La confiabilidad mostró un α de Cronbach = 0.863 y la confiabilidad test-retest mostró valores más bajos de lo esperado. El gráfico de Bland-Altman mostró un sesgo medio de -1.5 con límites inferior y superior de 15.8 a 12.8, respectivamente. **Conclusión.** El RIS-10 adaptado a la población mostró un desempeño adecuado en las propiedades psicométricas utilizadas para evaluar la intensidad del arrepentimiento relacionado con la prestación de atención a la salud.

Descriptores: emociones; personal de salud; adaptación psicológica; psicometría; estudio de validación.

Validação da versão em português da escala Regret Intensity Scale (RIS-10) para medir a intensidade do arrependimento associada à prestação de atenção em saúde

Resumo

Objetivo. O objetivo do estudo foi adaptar e validar a Regret Intensity Scale-10 (RIS-10) para profissionais de saúde brasileiros. **Métodos.** O estudo de validação ocorreu em duas fases, sendo a primeira a tradução dos instrumentos e a segunda, a validação de campo utilizando as propriedades psicométricas validade e confiabilidade da escala com 341 profissionais (médicos, enfermeiros e fisioterapeutas) vinculados a hospitais. A validade foi avaliada por meio de validades de conteúdo (avaliação de seis juízes), critérios (correlação com a Escala de Satisfação de Vida - SWLS e Self-Reporting Questionnaire 20 -SRQ-20) e construto (análise exploratória usando o método de rotação Promax, com base no gráfico de inclinação e critério de Kaiser e confirmatório pelo modelo de equações estruturais) após aplicação do questionário aos profissionais. A confiabilidade foi medida pelo coeficiente α de Cronbach e teste de reteste em um período máximo de 30 dias. A reprodutibilidade foi calculada por correlação intraclasse**.** **Resultados.** Participaram 341 profissionais, com média de idade de 38.6 ± 9.2 anos. O índice de validade de conteúdo (IVC) foi de 1,00, para todos os itens da escala na proporção de concordância dos juízes. A análise fatorial exploratória mostrou correlação satisfatória (Kaiser-Meyer-Olkin = 0.88), sugerindo um modelo de dois fatores, que compreende os principais componentes da emoção de arrependimento (Fator I - emoções, Fator II - sentimentos), correspondendo a 64% da variação total do primeiro fator. Na confirmação, o índice raiz quadrada média residual padronizada = 0.063 ficou próximo do aceitável e os demais valores ficaram abaixo. A escala correlacionou-se positivamente com SRQ-20 (p <0.001) e negativamente com SLWS (p = 0.003). A confiabilidade apresentou (α de Cronbach = 0.863) e a confiabilidade teste-reteste apresentou valores menores do que o esperado. O gráfico de Bland-Altman mostrou um viés médio de -1.5 com limites inferior e superior de 15.8 a 12.8, respectivamente**.** **Conclusão.** O RIS-10 adaptado para a população apresentou desempenho adequado nas propriedades psicométricas avaliadas para avaliação da intensidade do arrependimento relacionado à prestação de cuidados de saúde.

Descritores: emoções; profissionais da saúde; enfrentamento; psicometria; estudos de validação

Introduction

Health practice requires that, in addition to theoretical and practical knowledge, an emotional balance between practice and choices during activities emotional control psychological balance about their experiences. Acceptance by the professional that he cannot control all aspects of a situation is important for his mental health and, therefore, indirectly contributes to his quality of care. [1] Regrets related to clinical practice may be present at various moments of the professional–patient relationship, such as during diagnosis, treatment, evaluation of results, patient management, and interpersonal relationships. [2] The consequences of decisions made in a professional capacity can affect not only the clinical practice of professionals, but also their psychological and physical health.[1] Thus, a better understanding of feelings of regret experienced by health care practitioners and their consequences can contribute to improved emotional support and quality of care.[3]

Several instruments are capable of assessing the latent trait of regret in health professionals. However, these instruments do not evaluate regret comprehensively; more commonly, their scope is limited to the negative aspects of regret in a given situation.[4] Furthermore, some of the validated scales available in Brazil present an excessive number of items, which limits the use in most clinical scenarios.[5] In this context, the Regret Intensity Scale-10 (RIS-10), which comprises a mere 10 items, is a feasible scale that measures the self-reported intensity of feelings of regret related to care by health professionals. This instrument was originally developed in French and it was validated in German. The tool presented with good psychometric properties in both validations and presents a feasible approach for the screening of regret related to health practice. [1,6,7] Therefore, this study aimed to validate the RIS-10 in Brazilian health professionals.

Methods

Study design and Participants. This cross-sectional study recruited from pediatric and adult populations in public and private hospital services in the states of Espírito Santo, Ceará, Pernambuco, Alagoas, Piauí, Bahia, Acre, Minas Gerais, Rio de Janeiro, São Paulo and Rio Grande do Sul from October 2018 to April 2019. Health professionals participated in the study (physicians, nurses, and physiotherapists), working in direct care to patients and who have at least six months of experience in the service. Participants were recruited through an invitation.

Data Measurements. (i) Sociodemographic variables were obtained through structured interviews and included age (years), sex (male or female),

professional designations (title, number of works, work experience time, typical work shift, and state of origin); (ii) **Regret Intensity Scale-10 (RIS-10)** includes 10 items that assess the intensity of regret experience in the context of patient care within the last five years. The answer options ranged from 1 = no regret, to 5 = intense regret.[7] The intensity of regret is estimated by the total score, which is the sum of the responses of item on the scale, yielding a minimum score of 10 and a maximum of 50. The higher the score, the higher is the implied intensity of regret; (iii) **Self-Reporting Questionnaire-20 (SRQ-20)** was validated in Brazilian Portuguese. This tool comprises 20 items that propose to evaluate the prevalence of common mental disorders by evaluating depressive and anxious symptoms and somatic complaints.[8] The final score is the sum of the answers, which can range from 0 (null probability) to 20 (high probability); and (iv) **Life Satisfaction Scale** comprises five items answered using a 7-point Likert scale, with 1 = totally disagree, 2 = disagree, 3 = disagree slightly, 4 = neither agree nor disagree, 5 = agree slightly, 6 = agree, and 7 = totally agree.[9]

Validation

The RIS-10 questionnaire was validated in Brazilian Portuguese in two phases following the criteria proposed by the International Test Commission: Phase 1 - Instrument adaptation process and Phase 2 - Evaluation of the instrument's psychometric properties.[10,11]

Phase 1 - Instrument adaptation process

Translation. Translation of the RIS-10 encompassed the following steps: (i) translation by two German–Brazilian Portuguese translators; (ii) harmonization between both Portuguese versions, resulting in a single version in Portuguese; (iii) back-translation of the harmonized version by two Brazilian Portuguese–German translators; (iv) harmonization between both translators, resulting in a single German version; and (v) general harmonization, where the versions resulting from the first and second harmonization were discussed by the four translators to obtain a consensus version.[10] We also translated the RIS-10 from French into Portuguese by two translators and harmonized these translations to assess the differences between the translated versions of German and French. Given that no differences were found between these translations, we adopted the German-to-Portuguese translation as the official translation.

Phase 2 - Evaluation of the instrument's psychometric properties

Content validation. After the scale was translated, the process of cultural adaptation began. For this, this version of the scale was evaluated in relation to content by judges with clinical experience in the studied latent trait. Six judges who have been working in the health care area for more than 5 years participated from each of the following areas: 2 physicians, 2 nurses, 1 psychologist and 1 physiotherapist. First, the evaluation was done qualitatively, to obtain the possible suggestions for a better cultural adaptation of the translated terms. The level of agreement among the judges regarding the relevance and representativeness of the items was evaluated by the Content Validity Index (CVI). A 4-point Likert scale was used, where: 1 = not relevant; 2 = item needs a large revision to be representative (not relevant); 3 = quite clear, but needs a small review (very relevant); and 4 = quite clear and representative (highly relevant).[12] This index is calculated by the sum of the 3- and 4-point answers divided by the total number of judges, yielding a proportion of judges who deemed the item valid. However, 1- and 2-point answers required revision or elimination. To calculate the general CVI of the instrument, the sum of all CVI calculated separately was performed, divided by the number of items.[12] A CVI exceeding 0.78 is considered an acceptable agreement rate when six judges participate, which was the case in our study.[12] The scale's content was evaluated through a pilot study of 10 professionals, six nurses, three physicians, and one physiotherapist.

Construct validity. Construct validity testing was performed with exploratory and confirmatory factor analysis. Exploratory factor analysis was performed with the Promax rotation method and used the Kaiser measure to assess the adequacy of the sample to a latent factorial structure. The evaluation of the adequacy of a latent factorial structure to the data was measured using the Kaiser–Meyer–Olkin (KMO) with polychoric correlation and the interpretation of the slope graph considered the number of factors corresponding to the change in the slope of the graph. Confirmatory factor analysis (CFA) verified the factorial structure suggested in the original scale with one factor using the structural equation mode,[7] the adjustment and quality of the sample of this study to the factorial structure was examined using the following: x^2 (chi-square model), goodness of fit index (GFI), root mean square error of approximation (RMSEA), standardized root mean squared residual (SRMR), normed-fit index (NFI), comparative-fit index (CFI), Tucker-Lewis index (TLI), and Bollen's incremental fit index (IFI). The cut-off points considered acceptable for scale adjustment were as follows: x^2: $p > 0.05$,GFI > 0.90; RMSEA < 0.08, SRMSR < 0.10, NFI ≥ 0.90, CFI > 0.90, TLI > 0.95, and IFI > 0.90.[13]

Criterion validity. For criterion validity, the total score of the RIS-10 scale was correlated with the questionnaires validated in Brazil, namely, the SRQ-20 and the Life Satisfaction Scale. The intensity of regret is theoretically related to a higher prevalence of common mental disorders and lower life satisfaction. Correlations were evaluated using the Spearman's rho (ρ), and values of $r > 0.3$ were considered acceptable.[14]

Reliability. The reliability measures of internal consistency, floor and ceiling effects, test–retest, and Spearman–Brown coefficient were used. Cronbach's α was used for internal consistency.[15] The floor and ceiling effect were evaluated by determining the lowest and highest percentage of the population in the application of the scale.[16] The Spearman–Brown coefficient was analyzed by the split method, as detailed in the following strategies. First, the items were randomly divided into two equal halves. A scale mean was computed for each half, and then the two sets of scale means were correlated to estimate a split-half correlation. The split-half correlation was adjusted by the Spearman–Brown formula to create a split-half reliability.[17] Test-retest reliability was analyzed using the intraclass correlation and Bland–Altman plots. Data collection for test–retest analysis was performed within a maximum period of 30 days. Interpretations of the reliability test items were as follows: Cronbach's α was ≥0.7, as recommended;[15] the criterion considered to floor and ceiling effect was >20%;[16] the intraclass correlation (CIC) was considered acceptable when ≥0.7[15] and Spearman–Brown coefficient was >0.3.[14] The data were analyzed using the statistical software SAS v.9.4, the Lavann package v.0.6-5, and psych v.2.1.6 of R. This study uses a p of 0.05 as the statistical threshold of significance.

Sample size. Calculation of the sample size was based on the psychometric properties evaluated and aimed for a ratio of 10:1 (10 respondents for 1 item of the instrument).[18] Since the scale contains a total of 10 items, 100 participants would be needed.

Ethical issues. This study was approved by the ethics committee of the Pontifícia Universidade Católica do Rio Grande do Sul – PUC/RS (CAAE: 2.462.827/2018). All participants signed an informed consent form prior to the study. The use of the scale in this study was authorized by the author who developed it.

Results

Sample characteristics. Considering the possible losses, we invited 500 professionals to participate in the study. Of the 500 total questionnaires distributed, 341 were completed (68%). Of the 159 questionnaires that were not returned, 119 were from the online version of the questionnaire 89 (75%) and 40 (25%) from the printed version. The proportion of participating institutions 9 public (64%), 3 private (21%) and 2 philanthropic (14%). The mean age of the participants was 38.6 ± 9.2 years. The majority of the sample was female (217 of 341; 64%), and 190 (56%) respondents were married. Furthermore, 164 (48%) respondents were nursing professionals, one work only186 (56%) had only one employment relationship, and 135 (41%) worked the night shift. The interviewees originated predominantly from the state of Espírito Santo (76%; Table 1). The overall mean coping score was 2.3 ± 0.39.

Table 1. Characteristics of the Brazilian sample

Variables	*n*=341
Age in years; mean (SD)	38.6 (9.2)
Sex; *n* (%)	
Male	124 (36)
Female	217 (64)
Marital status; *n* (%)	
Single	151 (44)
Married	190 (56)
Professional; *n* (%)	
Doctor	126 (37)
Nurse	164 (48)
Physical therapist	51 (15)
Amount of employment; *n* (%)	
One employment n (%)	186 (56)
Works at night shift; *n* (%)	135 (41)
State of origin; *n* (%)	
Espírito Santo	260 (76)
Rio Grande do Sul	38 (11)
Other	43 (13)

Instrument translation and cultural adaptation. The items of **RIS-10** were consistent in both the translation and back-translation processes. Any terms that translated differently between translators were discussed and resolved to ensure uniformity of the instrument (Online supplement).

Content validity. The level of agreement among the judges regarding the relevance and representativeness of the items evaluated by the CVI was 1.00.

Construct validity. The exploratory factor analysis showed the adequacy and detection of the structure with KMO test (KMO = 0.88) and was considered a good sample fit for the latent factor structure. The analysis allowed the extraction of two factors, the first of which was responsible for 54% and with the second 64% of the total variation), as confirmed in the application of the slope graph. The correlation between the two factor was 0.75.

The factorial loadings of the latent factor structure are shown in Table 2. Items were distributed according to the structure suggested in the factor analysis composing a 2-factor model: Factor 1 comprises six items (3, 6, 7, 8, 9, and 10) of the scale, and Factor 2 was initially composed of four items (1, 2, 4, and 5). The factors describe the main components of the emotion of regret, which are feelings (i.e., emotions felt), physical manifestations, and cognitive processes. The lowest load item was "I feel undervalued".

Table 2. Exploratory factor analysis with ProMax rotation factor loading for RIS-10

Scale items	Scale items in Portuguese	Factor I emotions	Factor II feelings
Q.8- I can't concentrate right at work	Eu não consigo me concentrar direito no trabalho	**0.876**	–0.024
Q.7- I have trouble sleeping at home	Eu tenho dificuldades para dormir em casa	**0.856**	0.044
Q.10- I feel like crying	Eu tenho vontade de chorar	**0.803**	0.041
Q.9- I have the impression of no longer being made (the) for my profession	Eu tenho a impressão de não ser mais feita (o) para a minha profissão	**0.643**	0.042
Q.6- I get angry	Eu fico com raiva	**0.574**	0.180
Q.3- I feel devalued	Eu me sinto desvalorizado	**0.422**	0.271
Q.2- I feel uncomfortable	Eu me sinto mal	0.027	**0.960**
Q.1- Emotions come back to me	Eu tenho as mesmas emoções novamente	–0.064	**0.752**
Q.4- I feel ashamed	Eu sinto vergonha	0.182	**0.635**
Q.5- I have a knot in my stomach	Eu sinto um mal-estar no estômago	0.288	**0.440**
Eigenvalue		**5.42**	**1.01**

The CFA results were analyzed to verify the theoretical factorial structure: X^2 = p<0.001), RMSEA = 0.114 (90% CI: 0.098–0.130), SRMR = 0.063, GFI = 0.894, NFI = 0.842, CFI = 0.866, TLI = 0.828, and IFI = 0.867. The SRMR performed close to acceptable in the sample of this study; however, according to the other adjustment measurements (GFI, NFI, CFI, TLI, and IFI), the factor solution was considered below acceptable.

Concurrent validity. The RIS-10 scale showed a moderated positive correlation with the SRQ-20 questionnaire (ρ = 0.40, p < 0.001) and negative correlation with the Satisfaction with Life Scale (ρ = –0.15, p < 0.003).

Reliability. The RIS-10 regret scale presented adequate internal consistency with Cronbach's α coefficient (α = 0.86). Regarding the criterion of the floor and ceiling effects, values >20% were

observed in the scale. The ground effect was found in nine of the 10 items that constitute the instrument (items 1, 3–10). The ceiling effect was only observed in item 2 (Table 3).

Table 3. Floor and ceiling effect of the RIS-10 scale

Scale Items	Floor *n* (%)	Ceiling *n* (%)	Average (SD)
1. Emotions come back to me	72 (21)	43 (13)	57.5 (20.5)
2. I feel uncomfortable	54 (16)	74 (22)	64 (14.1)
3. I feel devalued	142 (42)	37 (11)	89.5 (74.2)
4. I feel ashamed	129 (38)	52 (15)	90.5 (54.4)
5. I have a knot in my stomach	182 (53)	20 (6)	101 (114.5)
6. I get angry	152 (45)	31 (9)	91.5 (85.5)
7. I have trouble sleeping at home	200 (59)	23 (7)	111.5 (125.1)
8. I can't concentrate right at work	197(58)	20 (6)	108.5 (125.1)
9. I have the impression of no longer being made (the) for my profession	225 (66)	14 (4)	119.5 (149.1)
10. I feel like crying	192 (56)	21 (6)	106.5 (120.9)
Total = 10 items			94 (20.1)

Eighty-seven professionals repeated the questionnaire for the test–retest reliability analysis. The intraclass correlation was 0.64 (95% CI: 0.5–0.75), and the Spearman–Brown coefficient ranged from 0.78 to 0.88 (SD = 0.05). Figure 2 shows the Bland–Altman plot of the agreement with the mean difference and the 95% agreement limits of the test and retest. The mean bias was –1.5, with lower and upper limits of 12.8 and 15.8, respectively.

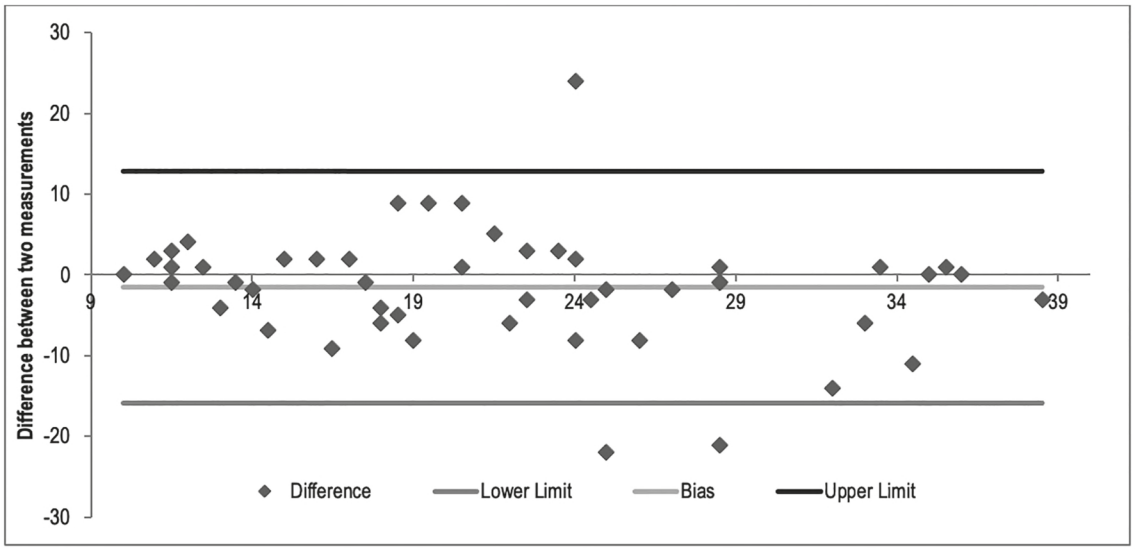

Figure 1. Bland-Altman graph of regret intensity (RIS-10) for baseline and 1-month follow-up surveys.

Discussion

The RIS-10 adapted for the Brazilian population presented with adequate psychometric properties, which may stem from how easily the questions were understood by the Brazilian population. The concise form of the questionnaire may also have contributed to its good psychometric performance. Likewise, the structured validation methodology and the input of professionals with different areas of expertise may have also played a contributory role.

The exploratory factor analysis suggested a two-factor structure, which differed from the original French and German versions that describe only a one-factor structure.[6,7] However, considering that nearly all of the total variance was explained by the first factor in the Brazilian version of the scale, one-factor structure was preserved. The items that diverged from the original version were: 1 = Emotions come back to me; 2 = I feel uncomfortable; 4 = I feel ashamed; and 5 = I have a knot in my stomach. Validity is not a fixed property and may differ according to population and situations.[19]

The intensity of regret assessed in the questionnaire was associated with consequences for mental health, due to the higher prevalence of common mental disorders such as depression and anxiety. Furthermore, and corroborating the results of the original study in French, intensity of regret, as measured by the scale, was found to be significantly related to lower satisfaction with life.[7] Exhaustion is strongly associated with affective-cognitive aspects, and there is evidence of its correlation with depression.[20] Decision regret may be associated with lower satisfaction, lower quality of life, lower levels of well-being, and other health problems such as anxiety, all of which can persist with the same intensity over time.[21,22]

Another important consideration is that our Brazilian scale showed a higher intensity of regret than did the German and French validation studies.[6,7] This discrepancy may have arisen

from cultural differences, given that emotions are talked about more openly in Brazil than in the countries to which the scale has been validated. The German study, for instance, described the difficulty evinced by the interviewees at talking about their emotions[6]. Regret is valued more highly than is other emotions commonly deemed unpleasant and some people may be more affectively reactive than others, thereby influencing any measures of regret.[21] Some factors that contribute to decision-making conflict and to higher levels of regret include processing delays, low-quality decisions, or overestimated actions to reach the best possible decision.[21] Adopting a shared approach is considered essential not only to improve the quality of the decision, but also to minimize any undesirable consequences of regret on users and professionals.[23]

The reliability of the Brazilian adaptation, as determined by Cronbach's alpha, was very close to that of the French (α =0.87) and German (α=0.88) versions,[6,15,24] considered sufficient according to the recommended parameters for internal consistency.[25] Unlike the German validation study, our study verified the ground effect with a 90% rate in relation to the responses at the lowest measurement levels. The reliability results of the RIS-10, accessed by the intraclass correlation, the Spearman–Brown coefficient, and Bland–Altman plot, were acceptable. These results can be explained by different intervals between the first and second test among professionals, completion of the questionnaire during their work shift, or other sources of error. There is no consensus in the literature on the ideal time interval between the first and second administration of the questionnaires;[19,26] however, it is recommended to be neither too short for the participant to have memorized the answers, nor too long that personal and environmental factors begin to interfere.[19]

Our study has limitations, one of which is the non-random sampling method that disproportionately represented the states of Espírito Santo and Porto Alegre. However, the study included participants from diverse states of Brazil (Southeast, Northeast, and South) that represent 83% of the population index and different areas of activity, thereby informing the validation of future instruments that can offer improved psychological services to health professionals throughout Brazil, given that most of the instruments are tailored for children and specific groups.[27] The study did not address professionals from institutions located in the states of the North and Midwest of the country.[28] However, we include the other regions and participants from public and private institutions for a larger representative population. Another contribution is attributed to the increase of scales validated for use in the health field with scope in the various scenarios of health professionals such as teaching, research, management, and clinical practice being a low-cost tool for its use.[29] The self-reporting methodology employed by questionnaires may be vulnerable to biases in self-esteem and social desirability. Nevertheless, questionnaires have the advantage of ease of administration over a wide range of potential scenarios. We did not evaluate the theory of response to the item, as used in the original study, due to the number of participants. A higher percentage of female respondents is observed, which can be attributed to the fact that demographic data in Brazil shows a predominance of women according to the annual population estimate from 2000 to 2060.[30] Also considering that in the health area there is a predominantly female contingent, mainly in the nursing team.[31] Other limitations include the restriction of the study population to health professionals in a hospital environment, and the limited generalizability to other professional environments in direct patient care. These limitations can help inform the design of future studies.

Conclusion. The RIS-10 adapted for the Brazilian population presented with adequate psychometric properties as evaluated by health professionals. This scale appears to be a feasible, rapid, and easy to use tool for evaluations of regret in health professionals.

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Online supplement of Regret intensity scale (RIS-10) - Portuguese version

Até que ponto as afirmações a seguir aplicam-se a você **hoje** quando relembra esta situação da qual se arrependeu? (marcar um X na resposta adequada em cada linha)
Quando penso na situação que mais me arrependo... (1) De forma alguma a: (5) Com certeza

Item	*1*	*2*	*3*	*4*	*5*
1. Eu tenho as mesmas emoções novamente					
2. Eu me sinto mal					
3. Eu me sinto desvalorizado					
4. Eu sinto vergonha					
5. Eu sinto um mal-estar no estômago					
6. Eu fico com raiva					
7. Eu tenho dificuldades para dormir em casa					
8. Eu não consigo me concentrar direito no trabalho					
9. Eu tenho a impressão de não ser mais feita (o) para a minha profissão					
10. Eu tenho vontade de chorar					

Poor glycemic control and associated factors in diabetic people attending a reference outpatient clinic in Mato Grosso, Brazil

Original article

Mariano Martínez Espinosa[1]
https://orcid.org/0000-0002-0461-5673
Vitesinha Rosa dos Santos Almeida[2]
https://orcid.org/0000-0003-27772118
Vagner Ferreira do Nascimento[3]
https://orcid.org/0000-0002-3355-163X

UNIVERSIDAD DE ANTIOQUIA
1803

Poor glycemic control and associated factors in diabetic people attending a reference outpatient clinic in Mato Grosso, Brazil

Abstract

Objective. To identify the proportion of poor of glycemic control and associated factors among people with type 2 diabetes attending a regional reference outpatient clinic in Mato Grosso (Brazil). **Methods.** This is a cross-sectional quantitative study based on data from medical records of 338 people with type 2 diabetes who attend a state reference outpatient clinic in Mato Grosso (Brazil). Information on glycemic control, sociodemographic factors, lifestyle and clinical conditions was collected. **Results.** The prevalence of elevated glycated hemoglobin was 47.34%. In the Poisson multiple regression model analysis with robust variance, poor glycemic control was significantly associated ($p<0.05$) with the following factors: insulin use (Prevalence Ratio -PR = 2.03), fasting glucose ≤70 and ≥100 mg/dL (PR = 2.0), postprandial

1 Statistician, Ph.D. Professor at the Department of Statistics, Universidade Federal de Mato Grosso (UFMT) Cuiabá - MT Brazil. Email: marianomphd@gmail.com
2 Nurse, Master's degree. Sentinel Surveillance Nurse in MS, Cuiabá - MT Brazil. Email: vitesinha@gmail.com. Corresponding author
3 Nurse, Ph.D. Adjunct Professor III, Universidade do Estado de Mato Grosso (UNEMAT) Tangará da Serra - MT Brazil. Email: vagnernascimento@unemat.br

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glucose ≥180 mg/dL (PR = 1.76), no physical activity (PR = 1.62), the interaction between age group ≤59 years and the time of disease diagnosis >10 years (PR = 1.58), and presence of arterial hypertension (PR = 0.79). **Conclusion.** Most users of the reference outpatient clinic with type 2 diabetes had poor glycemic control associated with risk factors that alter glycated hemoglobin and negatively affect the achievement of established glycemic levels.

Descriptors: type 2 diabetes mellitus; glycated hemoglobin A; risk factors; control.

Descontrol glucémico y factores asociados en personas diabéticas que acuden a una clínica de referencia en Mato Grosso, Brasil

Resumen

Objetivo. Identificar la proporción de falta de control glucémico y los factores asociados entre las personas con diabetes tipo 2 que acuden a un ambulatorio regional de referencia en Mato Grosso (Brasil). **Métodos.** Se trata de un estudio transversal basado en los datos de las historias clínicas de 338 personas con diabetes tipo 2 atendidas en un ambulatorio estatal de referencia. Se tomó información del control glucémico, los factores sociodemográficos, el estilo de vida y las condiciones clínicas. **Resultados.** La prevalencia de hemoglobina glicosilada elevada fue del 47.34%. En el análisis del modelo de regresión múltiple de Poisson con varianza robusta mostró que el descontrol glucémico estaba significativamente asociado ($p<0.05$) con los siguientes factores: el uso de insulina (Ratio de Prevalencia -RP = 2.03), la glucemia en ayunas ≤70 y ≥100 mg/dL (PR = 2), la glucemia postprandial ≥180 mg/dL (PR = 1.76), la ausencia de actividad física (PR = 1.62), la interacción entre el grupo de edad ≤59 años y el tiempo de diagnóstico de la enfermedad >10 años (PR = 1.58) y la presencia de hipertensión (PR = 0.79). **Conclusión.** Una buena parte de los usuarios del ambulatorio de referencia con diabetes tipo 2 presentaba descontrol glucémico asociado a factores de riesgo

que alteran la hemoglobina glicosilada y afectan negativamente la consecución de los niveles glucémicos establecidos.

Descriptores: diabetes mellitus tipo 2; hemoglobina A glucosilada; factores de riesgo; control.

Descontrole glicêmico e fatores associados em pessoas diabéticas que consultam em ambulatório de referência de Mato Grosso, Brasil

Resumo

Objetivo. Identificar a proporção de falta de controle glicêmico e fatores associados entre pessoas com diabetes tipo 2 que visitam um ambulatório de referência regional em Mato Grosso (Brasil). **Métodos.** Trata-se de um estudo transversal e quantitativo, com base em dados de prontuários de 338 pessoas com diabetes tipo 2 atendidas em ambulatório de referência estadual de Mato Grosso (Brasil). Foi recolhida informação sobre controlo glicémico, factores socio-demográficos, estilo de vida e condições clínicas. **Resultados.** A prevalência de hemoglobina glicada elevada foi de 47.34%. Na análise do modelo de regressão múltipla de Poisson com variância robusta, foi demonstrado que o descontrole glicêmico foi significativamente associado ($p<0.05$) aos seguintes fatores: uso de insulina (Razão de Prevalência -RP = 2.03), glicemia de jejum ≤70 e ≥100 mg / dL (RP = 2.0), glicemia pós-prandial ≥180 mg / dL (RP = 1.76), nenhuma atividade física (RP = 1.62), a interação entre a faixa etária ≤59 anos e o tempo de diagnóstico da doença > 10 anos (RP = 1.58) e apresentar hipertensão arterial (RP = 0.79). **Conclusão.** Boa parte dos usuários do ambulatório de referência com diabetes do tipo 2 apresentou descontrole glicêmico associados a fatores de risco que alteram a hemoglobina glicada e afeta negativamente o alcance dos níveis glicêmicos estabelecidos.

Descritores: diabetes mellitus tipo 2; hemoglobina A glicada; fatores de risco; controle.

Introduction

Currently, about 463 million people have diabetes in the world, with estimates of reaching 700 million diabetic adults in 2045. This scenario also applies to Brazil, which ranks fifth among the ten countries with the highest number of diabetic adults, behind only China, India, the United States and Pakistan.[1] Specifically, type 2 diabetes mellitus (DM2), represents about 90% to 95% of all cases of diabetes worldwide, with higher proportions in low- and middle-income countries.[2] As DM2 is a chronic disease with disabling potential arising from its complications, it can have clinical, economic and social consequences for diabetic people, their families and the health system.[3] Type 2 diabetes mellitus can be the result of multiple factors, such as behavioral aspects (overweight, obesity, alcohol consumption, smoking), diet (refined carbohydrates and sugary foods, saturated fats), physical activity (physical inactivity, sedentary lifestyle), knowledge about one's own health/disease condition, and self-care (non-adherence to health promotion and maintenance actions).[4] As a result, people with DM2 find it difficult to control in their daily lives, which requires trained professionals to assist them. In Brazil, a study conducted in 38 Basic Health Centers found that 69.8% of participants had uncontrolled DM2,[5] as in other countries.[1-6]

Some professions stand out in the care of diabetics. Nursing, for example, leads these care actions, from screening to self-management support and family management of diabetic people, identifying facilitators and barriers to diabetes control and resources to provide more effective care. Although nurses do not make the DM diagnosis on their own, without nursing care interventions, the adherence and maintenance of treatment and adoption of new essential lifestyles for glycemic control can make coping with the disease more difficult, costly and deleterious for everyone involved with the diabetic person. In this sense, the assessment and monitoring of glycemic levels of diabetic people are essential care actions performed by nursing, and have an important relationship with the reduction of morbidity (9.3%) and mortality (11.3%) rates globally.[1]

Nursing care for diabetics includes requesting tests for monitoring the disease and tracking complications. Among these tests, glycated hemoglobin (HbA1c) is considered the gold standard. This biomarker allows the estimation of glycemic values for a period of up to three months, diagnosis of the metabolic situation, provision of therapeutic guidance and assessment of the effectiveness of treatment in people with DM2.[7,8] According to the Brazilian Society of Diabetes,[9] HbA1c should be performed at least twice a year for individuals with favorable glycemic control and at least three times for those with difficulties in maintaining blood glucose levels under control. However, it is impossible to affirm that people with DM2 undergo this exam constantly. In the state of Mato Grosso, located in the Central West region of Brazil, among

diabetics with a diagnosis time of more than 12 months, 40% have not had consultations in the last three months, impacting on blood glucose monitoring.[10] In the city of Cuiabá, capital of the state, 43% of diabetic patients at a Basic Health Center had HbA1c with values above the standardized target, a finding that indicates the vulnerability of this population to poor disease management.[11]

Difficulties in glycemic control are a problem of alarming proportions, which annually add extra burden to public health services and overload reference units. Therefore, the aim of this study was to identify the proportion of poor glycemic control and associated factors among people with type 2 diabetes who visit a regional reference outpatient clinic in Mato Grosso (Brazil).

Methods

This is a cross-sectional, quantitative study conducted in a reference outpatient clinic in the state of Mato Grosso from November 2019 to March 2020. Mato Grosso is the third largest Brazilian state in terms of land area, the largest in the Center West region and part of the Amazônia Legal. The chosen outpatient clinic is the main one in the specialty of endocrinology in this state, as it receives and is the first reference center for the demands of 141 municipalities, with regular monitoring, free of charge by the National Health Service (Brazilian SUS). This clinic receives patients referred from other services, who can count on other specialists in the same space, such as nurses, social workers, pharmacists, nutritionists and psychologists, among others. There is also a laboratory for clinical analysis and the use of electronic medical records that allow the monitoring of this diabetic population.

This study included all patients over 18 years of age, with a DM2 medical diagnosis defined in their medical records and who presented a record of at least one laboratory test for Hb1Ac in 2019. For analysis of the HbA1c test, results from the last test performed in 2019 were considered. The study population was of the census type; 352 records were found at first, and after applying the inclusion and exclusion criteria, a total of 338 patients was reached. Data collection was performed in the Management Application system for University Hospitals - AGHU. Data were extracted digitally, organized in a spreadsheet with date of collection and subdivisions (demographic, laboratory "exams" and clinical diagnosis). Care was taken to include the medical record number in order to avoid duplicates. This process was conducted by one of the respondents, who was previously trained.

This system has several modules such as the Online Patient Record module and the outpatient care module. In the Online Patient Record, patient information is available electronically, clearly and with privacy control. This module provides access to registration data, clinical history, diagnoses and assistance provided (procedures, consultations, prescriptions, exams, guidelines and other activities of the patient in this clinic). Among the study variables, the dependent variable corresponded to glycemic control categorized according to the Brazilian Society of Diabetes.[9] Adult participants aged 18 to 59 years with HbA1c of less than 7% were considered to have adequate glycemic control and those with HbA1c greater than or equal to 7%, with inadequate glycemic control. In older adults over 60 years of age, HbA1c higher than 8.5% was considered inadequate control.

Independent variables included: (i) Sociodemographic aspects. Sex (male and female); age (18 to 59 years and 60 years or older); skin color (non-white and white); marital status (without a partner and with a partner); education (no schooling, less than or equal to 8 years, and more than 8 years); origin (other municipalities and municipality of Cuiabá); (ii) Lifestyle. Physical activity practice: no (when the individual performed physical activity less than twice or not

once a week); no information (when the individual did not indicate if performed physical activity); and yes (when the individual performed physical activity at least twice a week);[12] and (iii) Clinical conditions. Postprandial blood glucose (greater than or equal to 180 mg/dL and less than 180 mg/dL) and fasting glucose (less than or equal to 70 mg/dL, greater than 100 mg/dL, and 70-100 mg/dL);[9] insulin use (yes and no); diagnosis time (greater than 10 years and less than or equal to 10 years); cardiovascular diseases: high risk (for those with a history of developing cardiovascular disease), cardiovascular disease (when the individual had a history of diagnosis of acute myocardial infarction, angina, heart failure) and not (for those with history of absence of risk); systemic arterial hypertension: yes (with history of diagnosis) and no (no history of diagnosis); amputation: yes (with history) and no (without history); obesity (yes and no) - measured based on the calculation of the body mass index (BMI) and classified as grade I, grade II, and grade III when BMI ≥ 30 kg/m; hospitalization: yes (admission for DM2 in the previous year) and no (no admission for DM2 in the previous year); retinopathy; neuropathy and nephropathy; ulcers; dyslipidemia; psychological (anxiety and depression). The latter were categorized into yes (with history of diagnosis) and no (no history of diagnosis). The clinical conditions of individuals were included in the medical records and identified by medical diagnosis.

Data were organized in Microsoft Excel version 2013 spreadsheets by double typing and later checked using the Data Compare tool. Then, the Statistical Package for the Social Sciences (SPSS) version 20 was imported for the analyzes. In the analysis of associations between the dependent variable and independent variables, a bivariate analysis was initially performed using the chi-square test and crude prevalence ratios with their respective 95% confidence intervals. After bivariate analysis, a multiple analysis using the Poisson multiple regression model with robust variance was considered. In this model, all independent variables that presented $p<0.20$ in the bivariate analysis were introduced using the stepwise forward process. In all inferences, significance levels less than or equal to 5% and 95% confidence were considered.

Data collection began only after approval by the Research Ethics Committee under CAAE: 22270519.2.0000.5541 and opinion number 3.675.333. An authorization term for the use of information from medical records was granted.

Results

Among the study participants, most were females (73.08%), mean age of (58.07) years, standard deviation of 10.95. Almost half of all patients (47.34%) had uncontrolled blood glucose levels. Lack of glycemic control was also more prevalent among women (48.18%), non-white (47.62%), with less than eight years of schooling (43.46%), who lived with a partner (47.35%) and were from other cities (56.79 %). In Table 1, poor glycemic control was associated with the age of participants ($p<0.001$). In this case, altered HbA1c was 0.80 times more prevalent among those aged ≤ 59 years.

Table 1. Crude prevalence ratios of sociodemographic factors associated with elevated glycated hemoglobin test. Cuiabá, Mato Grosso, Brazil, 2020

Factors	Category	Glycated hemoglobin				PR_c	95% CI	*p*-value
		Elevated		Normal				
		n	%	*n*	%			
Sex (*n*=338)	Male	41	45.05	50	54.95	0.94	[0.72 ; 1.21]	0.610
	Female	119	48.18	128	51.82	1.00	-	-
Age (*n*=338)	≤59 years	97	62.18	59	37.82	1.80	[1.42; 2.27]	<0.001
	60 years or over	63	34.62	119	65.38	1.00	-	-
Skin color (*n*=332)	Non-white	150	47.62	165	52.38	1.16	[0.65; 2.07]	0.604
	White	7	41.18	10	58.82	1.00	-	-
Marital status (*n*=324)	No partner	45	45.92	53	54.08	0.97	[0.75; 1.25]	0.813
	With partner	107	47.35	119	52.65	1.00	-	-
Years of schooling (*n*=327)	No information	24	58.54	17	41.46	1.11	[0.79; 1.56]	0.554
	≤8 years	93	43.46	121	56.54	0.82	[0.63; 1.08]	0.170
	>8 years	38	52.78	34	47.22	1.00	-	-
Origin (*n*=338)	Other municipalities	46	56.79	35	43.21	1.28	[1.01; 1.62]	0.051
	Cuiabá	114	44.36	143	55.64	1.00	-	-

** PRc: crude prevalence ratio. 95% CI: 95% confidence interval. p: Significance level considering the chi-square distribution.

In Table 2, there is a statistically significant association between poor glycemic control with the categories: no physical activity, postprandial blood glucose ≥180 mg/dL, fasting blood glucose ≤70 and ≥100 mg/dL, yes for insulin use, diagnosis time >10 years, and high risk for cardiovascular disease.

Table 2. Crude prevalence ratios of lifestyle factors and clinical conditions associated with elevated glycated hemoglobin test. Cuiabá, Mato Grosso, Brazil, 2020

Category	Glycated hemoglobin				PR_c	95% IC	*p*-value
	Elevated		Normal				
	n	%	*n*	%			
Physical activity (*n*=315)							
No	118	56.46	91	43.5	1.87	[1.37; 2.56]	<0.001
No information	10	43.48	13	56.5	1.44	[0.83; 2.49]	0.218
Yes	32	30.19	74	69.8	1.00	-	-
Postprandial glucose (*n*=297)							
≥180 (mg/dL)	105	63.25	61	36.75	2.30	[1.70; 3.11]	<0.001
<180 (mg/dL)	36	27.48	95	72.52	1.00	-	-
Fasting glucose (*n*=334)							
≤70 and ≥100 (mg/dL)	147	51.40	139	48.60	2.24	[1.32; 3.81]	<0.001
70-100 (mg/dL)	11	22.92	37	77.08	1.00	-	-
Use of insulin (*n*=338)	116	62.70	69	37.3	2.18	[1.66; 2.87]	<0.001
Diagnosis time (*n*=335)							
>10 years	72	55.38	58	44.6	1.29	[1.04; 1.61]	0.026
≤10 years	88	42.93	117	57.1	1.00	-	-
Cardiovascular diseases (*n*=338)							
High risk	79	55.63	63	44.37	1.42	[1.12; 1.79]	0.004
Diseases	11	61.11	7	38.89	1.55	[0.90; 2.34]	0.074
No	70	39.33	108	60.67	1.00	-	-
Systemic arterial hypertension (*n*=338)	114	44.53	142	55.5	0.79	[0.63; 1.01]	0.068
Amputation (*n*=338)	2	22.22	7	77.8	0.46	[0.14; 1.58]	0.126*
Obesity (*n*=338)	72	52.17	66	47.8	1.19	[0.95; 1.48]	0.139
Hospitalization (*n*=338)	6	75.00	2	25.00	1.61	[0.68; 2.44]	0.156*
Retinopathy (*n*=338)	23	54.76	19	45.2	1.18	[0.88; 1.60]	0.303
Neuropathy (*n*=338)	9	56.25	7	43.75	1.20	[0.77; 1.88]	0.464
Nephropathy (*n*=338)	15	41.67	21	58.3	0.87	[0.58; 1.30]	0.471
Ulcers (*n*=338)	13	54.17	11	45.8	1.16	[0.79; 1.70]	0.487
Dyslipidemia (*n*=338)	81	48.21	87	51.8	1.04	[0.83; 1.30]	0.748
Psychological anxiety and depression (*n*=338)	36	47.37	40	52.63	1.00	[0.77; 1.31]	0.995

* PRc: crude prevalence ratio. 95% CI: 95% confidence interval. p: significance level considering the chi-square distribution.
*: Fisher's exact test.

In the analysis adjusted by the Poisson multiple regression model with robust variance, the categories that remained associated with high results of the glycated hemoglobin test were: insulin use, fasting blood glucose ≤70 and ≥100 mg/dL, postprandial blood glucose ≥180 mg/dL, no physical activity, interaction between age ≤59 years and time of disease diagnosis >10 years, origin, arterial hypertension (Table 3).

Table 3. Adjusted prevalence ratios for factors associated with elevated glycated hemoglobin test. Cuiabá, Mato Grosso, Brazil, 2020

Category	PR_a	95% IC	*p*-value
Insulin use			
Yes	2.03	(1.54; 2.69)	<0.001
No	1.00	-	-
Fasting glucose			
≤70 and ≥100 (mg/dL)	2.00	(1.23; 3.27)	0.006
De 70-100 (mg/dL)	1.00	-	-
Postprandial glucose			
≥180 (mg/dL)	1.76	(1.35; 2.29)	<0.001
<180 (mg/dL)	1.00	-	-
Physical activity			
No	1.62	(1.21; 2.16)	0.001
No information	1.06	(0.63; 1.79)	0.825
Yes	1.00	-	-
Interaction between age group and disease diagnosis time			
≤59 years and >10 years	1.58	(1.01; 2.46)	0.046
60 years or over and ≤10 years	1.00	-	-
Origin			
Other municipalities	1.41	(1.13; 1.76)	0.003
Cuiabá	1.00	-	-
Age group			
≤59 years	1.39	(1.05; 1.83)	0.021
60 years or over	1.00	-	-
Diagnosis time			
>10 years	0.76	(0.52; 1.11)	0.163
≤10 years	1.00	-	-
Systemic arterial hypertension			
Yes	0.79	(0.64; 0.98)	0.033
No	1.00	-	-

PRa: prevalence ratio adjusted by Poisson's multiple regression model with robust variance. CI: confidence interval.

Discussion

The prevalence of uncontrolled blood glucose levels in this study (47.34%) is lower than the values found in other studies in Brazil, such as in the South (69.08%)[5] and Southwest (70.2%) regions of Brazil,[6] where alterations in HbA1c were found, as well as in other parts of the world such as Western Ethiopia, where (59.05%) had poor glycemic control.[13] This lower prevalence among study participants is possibly related to the care and monitoring provided by this type of reference service, in which the therapeutic strategy is based on self-care practices for glycemic control. In addition, as this service integrates the university hospital facilities, educational activities and continuing professional training are developed with care guided by holistic, global and multidisciplinary care perspectives, in which creative processes of guidance, monitoring and intervention are tested, rethought and transformed into more viable therapeutic projects to maintain adequate blood glucose parameters and prevent complications.[14]

It is important that the reference service is used whenever the clinical conditions of diabetic patients indicate this need, without disregarding the referral/counter-referral integration. As diabetes is a sensitive condition in the primary care service, secondary prevention interventions should also be prioritized by it. Several factors that affect glycemic levels have a linear relationship with primary care services, namely repeating the medical prescription without reinforcing the guidelines of the therapy to be used, lack of management of indications for changes in lifestyle habits and even the little contact with patients who sporadically attend the health service.[15] However, given the large scope of primary care actions, some weaknesses faced in the service should be mentioned, such as the high turnover of health professionals, lack of adequate infrastructure, low technological density, weak support systems for diagnosis and monitoring of a chronic disease as diabetes.

The association between elevated HbA1c and the use of insulin was similar to that observed in other national[6-11] and international studies.[13-16] The use of insulin in this population is not effective in maintaining adequate glycemic levels, as DM2 management goes beyond drug therapy. Diabetics face barriers imposed by insulin therapy itself, such as repetitive injections and the respective discomfort, lack of supplies (materials) or access to home care, difficulty in maintaining regularity and adherence to therapy (food, medication and physical activity), as well as understanding the disease and its consequences that also interfere with glycemic control.[17] Still, it is noteworthy that the use of insulin revolutionized the treatment of the disease and the benefits arising from its regular, systematic and appropriate use provided better quality of life for diabetic patients.

The present study points to a significant association between HbA1c alterations with postprandial glucose and fasting glucose. Blood glucose outside its normal range affects the control of HbA1c and this finding was rarely observed in other studies. Undoubtedly, this is a differential that requires professionals' greater perception of this fact and an appropriate management of the current condition, such as indication for fast acting insulin, if applicable,[18] or the use of other strategies, as mentioned in a Chinese study. It was found that a moderate intensity 20-minute walk after dinner can improve postprandial hyperglycemia, glycemic excursions and the normalization of fasting blood glucose in patients with DM2 with no potential risk of hypoglycemia.[19]

The association of elevated HbA1c with physical inactivity was also evidenced in a study conducted in Southwestern Bahia, Brazil.[4] This association was expected, as evidence shows that inactive individuals or those with a low level of physical activity present worse glycemic levels.[20] Physical activity is one of the pillars in the treatment of chronic noncommunicable diseases, as it brings benefits in reducing mortality rates from cardiovascular diseases and preventing complications. Therefore, the defense and expansion of the new 2020

guideline on physical activity and sedentary behavior is recommended.[12]

However, it is essential to deepen the meaning of physical activity and health established between professionals and patients, based on health literacy that integrates levels of information processing for the decision-making process. Assessing how information is being understood and applied to maintain or improve health is crucial in the health-disease process. Diabetic individuals with low health literacy are more likely to have complications resulting from lack of glycemic control, because the fewer information resources the less adherence to health promotion actions.[21] Another important aspect is the patient's individuality, as not all are equally able to perform physical activity regularly, even if of low intensity and without cost. Diabetic patients should be encouraged whenever possible and according to their ability, since reducing sedentary behavior is the best way to obtain positive health outcomes.[12]

Regarding age group, younger adults diagnosed with diabetes more than 10 years earlier were more likely to have poorer glycemic control compared to older patients with a relatively shorter diabetes diagnosis time (<10 years). Individuals aged 40 to 60 years with longer duration of the disease (>10 years) constitute a greater proportion of patients with poor glycemic control compared to those of different age groups.[16-22] This is a more recent reality, because although historically, poor glycemic control used to be more prevalent in older adults, nowadays, there is a higher incidence of diabetes in young people.[9] With the transformation of lifestyles and the approach to new care resources, there has been an increase in the longevity of this group and premature deaths of younger people resulting from exposure to risk factors (obesity, hypoactivity, alcoholism and smoking, another factor that can be attributed is the misuse of technologies in the contemporary world, added to the unavailability of time to perform physical activities, self-medication and others).[23] Hypertension was associated with poor glycemic control, a fact observed in another study.[5] Hypertension and DM2 are highly chronic diseases, and when developed jointly, they increase the risks of aggravation and deterioration of vital organs. In this context, one of the strategies to minimize such risks is based on the search for individuals who miss scheduled appointments, the survey of hospitalizations of hypertensive and diabetic patients in the community, and the activation of the formal and informal support network of these people, in order to monitor and strengthen the care bond.

In this study, the complexity of factors associated with the poor glycemic control identified, in addition to offering support for professional and scientific practice, reveals the diversity found in this care setting and the richness for the training of nurses experiencing this reality, as it is a field of development and continuous improvement of technical skills for students, teachers and health professionals. It is also an opportunity for nursing professors, tutors and preceptors to perceive and intervene in nursing students' weaknesses in the monitoring of patients with this clinical profile, considered one of the greatest demands of Primary Health Care in Brazil. A recent study conducted in the United States (USA) highlighted that during the nursing consultation, older and more experienced students asked fewer questions to diabetic patients, but 32% were more empathetic and 76% offered more guidance than their younger colleagues. Such a scenario also brings a reflection on the levels and leveling of nursing students throughout their academic training for the care of these patients.[24] Identifying these particularities that interfere in the therapeutic care of diabetic patients can also signal failures in professional training, since the form and management of diseases, among other aspects, is related to the perception of severity and importance given by professionals.

Undoubtedly, nursing is equipped with knowledge and theories that guide and support health care, an essence that fosters interpersonal relationships and the creation of lasting bonds, and supports

new lifestyles and the wellbeing of diabetic patients. In this context, thinking about the training of nurses in view of the prevalence of diabetics in the world, must include the premises of the profession, which acts not only after the confirmation of the clinical diagnosis, but in disease prevention and balance of human-nature relationships. In this direction, considering the advent of technologies strengthened during the COVID-19 pandemic, nurses and nursing students can empower themselves with telenursing as a resource for difficult-to-reach populations or those far from health services that enhances the effects of education in health and complements monitoring and surveillance measures. Furthermore, in recognizing the factors associated with poor glycemic control, this and other care technologies can improve the systematization of nursing care and consequently, predict and prevent the negative evolution of the disease.

Conclusions. This study revealed that most users of the reference outpatient clinic with DM2 had poor glycemic control and factors associated with changes in HbA1c, namely younger adults, physically inactive, hypertensive, those using insulin, with changes in fasting and postprandial glucose tests, as well as the interaction between age group with longer disease diagnosis time. The findings indicated that diabetic individuals who do not keep blood glucose levels under control are vulnerable to a poor prognosis due to inadequate management. We highlight that health services, whether Primary Health Care or reference service for diabetics, must be circumspect in all conditions for the desirable reach of HbA1c in order to prevent complications, reduce morbidity and mortality and minimize the impact on public health. This requires the collective intervention on risk factors, and not only in the care setting, but in contexts of academic and professional training.

A limitation of the study was the lack of sociodemographic variables such as income, professional occupation and family history, which could help to better elucidate this scenario of poor glycemic control. However, for the first time in this Brazilian state, the variables associated with poor glycemic control in people with DM2 in this health service profile were identified. Given the importance of the findings, further research must be performed with a view to provide more evidence for the care of diabetics and consequently, reduce the number of referrals to reference services.

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Physiological changes in vision during aging: perceptions of older adults and healthcare providers

Original article

Tattiana Dias de Carvalho Cordeiro[1,7]
https://orcid.org/0000-0003-1843-8687

Luípa Michele Silva[2,8]
https://orcid.org/0000-0001-6147-9164

Edilene Araujo Monteiro[3,7]
https://orcid.org/0000-0002-3312-868X

Maria de Lourdes de Farias Pontes[4,7]
https://orcid.org/0000-0002-5187-6876

Francine Golgheto Casemiro[5,9]
https://orcid.org/0000-0001-8932-3604

Rosalina Aparecida Partezani Rodrigues[6,9]
https://orcid.org/0000-0001-8916-1078

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Physiological changes in vision during aging: perceptions of older adults and healthcare providers

Abstract

Objective. To identify the physiological changes in older adults' vision during the aging process. **Methods.** An exploratory, descriptive study with a qualitative approach was conducted with 20 older adults and six healthcare providers who worked with older adults in João Pessoa, Paraíba (Brazil). The Focus Group Technique was used for data collection, with the collected information subsequently being submitted to Inductive Thematic Analysis using textual analysis software. **Results.** The physiological changes related to vision were described by both the older adults and healthcare providers using the following words: vision, difficulty; see; cataract; glasses; surgery; more; age; eye; and no. These terms represent declines in vision resulting from advancing age which significantly modify the daily lives of older adults and their families. **Conclusion.** The perception of the older

1 Registered Nurse, MSc. Centro de Ciências da Saúde. Email: tattianadccarvalho@gmail.com
2 Registered Nurse, Post doctorate. Assistant Professor Email: luipams@gmail.com
3 Registered Nurse, PhD. Assistant Professor Email: edileneam06@gmail.com
4 Registered Nurse, PhD. Assistant Professor Email: profa.lourdespontes@gmail.com
5 Gerontologist. PhD student. Escola de Enfermagem de Ribeirão Preto/USP. Ribeirão Preto- SP- Brazil. Email: francine_gc@hotmail.com
6 Registered Nurse, PhD. Full Professor, Escola de Enfermagem de Ribeirão Preto/USP. Ribeirão Preto- SP- Brazil. Email: rosalina@eerp.usp.br. Corresponding author
7 Universidade Federal da Paraíba. João Pessoa- Paraíba- Brazil
8 Universidade Federal de Catalão – Goiás- Brazil.
9 Escola de Enfermagem de Ribeirão Preto/USP. Ribeirão Preto- SP- Brazil

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adults and the healthcare providers who care for them regarding the physiological changes in vision throughout the aging process shows that the loss of visual acuity significantly affects the daily life of older adults and their families.

Descriptors: geriatric nursing; aged; vision, ocular; aging.

Cambios fisiológicos en la visión durante el envejecimiento: la percepción de las personas mayores y de los profesionales

Resumen

Objetivo. Describir la percepción de las personas mayores y de los profesionales que trabajan con ellas sobre los cambios fisiológicos en la visión durante el proceso de envejecimiento. **Métodos.** Estudio exploratorio, descriptivo con análisis cualitativo, realizado con 20 adultos mayores y seis profesionales de la salud que trabajan con adultos mayores en Paraíba (Brasil). Para la recolección de los datos se utilizó la técnica de grupo focal. A la información recopilada se le realizó el análisis de temática inductiva con la ayuda del software de análisis textual. **Resultados.** Tanto los adultos mayores como los profesionales describieron los cambios fisiológicos relacionados con la visión con las siguientes palabras: visión, dificultad, ver, catarata, anteojos, cirugía, más, edad, ojo y "no". **Conclusión.** La percepción de los adultos mayores y de profesionales que los atienden sobre los cambios fisiológicos en la visión muestra que la pérdida de la agudeza visual modifica significativamente la vida cotidiana del anciano y la de su familia.

Descriptores: enfermería geriátrica; anciano; visión ocular; envejecimiento.

Alterações fisiológicas da visão durante o envelhecimento: percepção de idosos e profissionais

Resumo

Objetivo. Descriver a percepção de idosos e profissionais que trabalham com idosos sobre as alterações fisiológicas da visão durante o processo de envelhecimento. **Métodos.** Estudo exploratório, descritivo, com análise qualitativa, realizado com 20 idosos e seis profissionais de saúde que trabalham com idosos em João Pessoa, Paraíba (Brasil). Para a coleta de dados, utilizou-se a Técnica de Grupos Focais, sendo que os dados foram submetidos à Análise Temática Indutiva com auxílio de um software de análise textual. **Resultados.** As alterações fisiológicas relacionadas à visão foram descritas tanto pelos idosos quanto pelos profissionais por meio das seguintes palavras: visão, dificuldade; enxergar; catarata; óculos; cirurgia; mais; idade; olho e não. Esses termos representam declínios da visão decorrentes do avanço da idade que modificam significativamente o cotidiano dos idosos e seus familiares. **Conclusão.** A percepção dos idosos e dos profissionais que os cuidam sobre as alterações fisiológicas da visão mostra que a perda da acuidade visual modifica significativamente o cotidiano do idoso e de sua família.

Descritores: enfermagem geriátrica; idoso; visão ocular; envelhecimento.

Introduction

Although not all older adults have health problems, the aging process is marked by physiological impairments that often generate direct impacts on the health and social security systems. Increasingly, technological advances in health are providing an extension of life, with gains in quality accompanied by a reduction in mortality rates from non-communicable diseases and greater access to better public and private health services.[1] In older adults with physiological impairments, attention should be paid to the possibility that the sense organs are being impacted. Sensory deficits occur gradually, imposing restrictions to varying degrees on the older adult's daily activities, as well as affecting the spheres of safety and independence, general well-being and quality of life, with it being important to assess whether or not they are symptomatic of an underlying disease.[2]

The eye is the organ of the sensory system that undergoes the most impactful changes. In general, there are some impairment in the structure of the eye, in the visual function, from the fourth decade of life, for several reasons: loss of elasticity of the eyelids, making them soft and wrinkled, intrinsic eye diseases (cataracts) and acquired neurological or systemic diseases (diabetes), for example.[3] In addition to the examples mentioned, other physiological changes in vision in older adults should be highlighted, such as: decreased visual acuity, narrowing of the visual field, sensitivity to bright light, poor night vision, confused dark colors and dry eyes.[4]

Accordingly, healthcare providers, especially nurses, have the role of ensuring the necessary care to promote well-being and quality of life for older adults, maintaining their autonomy and independence.[3] In the multidimensional assessment of the older adult, the vision is the sense that establishes the relationship of the person with others and with the environment, therefore, in nursing care it is essential to highlight this knowledge in the area, which is one of the gaps in nursing. It is considered essential to contribute to the formation of healthcare providers so that they are better prepared to comprehend the aging process and the care demands at this stage of life, supported by scientific research. For this purpose, the following research questions were established: What is the perception of older adults regarding the physiological changes in their vision during aging? What is the perception of healthcare providers who work with older adults regarding the difficulties related to changes in the vision of these people assisted during the aging process? The aim of the study was to analyze the perception of older adults and healthcare providers who work with older adults regarding the physiological changes in the older person's vision throughout the aging process.

Methods

This was an exploratory, descriptive and qualitative study. Data were collected using the Focus Group (FG) technique and analyzed according to Inductive Thematic Analysis. The field research took place in two care spaces for older adults: at the *Centro de Atenção Integral à Saúde do Idoso* (CAISI) in the city of João Pessoa/PB and at the *Instituto Paraibano de Envelhecimento* of the Federal University of Paraíba-UFPB (IPE/UFPB). The CAISI is a service of the Municipal Health Department of João Pessoa that provides specialized medical care and assistance in the areas of physiotherapy, speech therapy, psychology, nutrition, and nursing, as well as performing operative groups, with activities aimed at prevention and health promotion.[5]

The study population consisted of older adults who attended the operative groups of the CAISI and healthcare providers from the Graduate Program in Gerontology (students and professors) of the aforementioned public university, which has a multidisciplinary nature. It should be highlighted that the use of these two varied scenarios favored the apprehension of different knowledge and, therefore, the understanding of the subject. The inclusion criteria for the older adults were: being 60 years of age or over; availability to be present at more than one meeting; and presenting good communication and sufficient cognitive status to answer the questions, verified through simple questions such as name, date of birth and day of the month, week and current year (2019). The inclusion criteria for the healthcare providers were: to have academic training and/or to exercise practical activity in the care of older adults; and to be available to be present at more than one meeting. One of the researchers visited three operative groups at the CAISI in order to present the research proposal and invite the older adults. After the invitation, the older adults that were interested provided data such as name, age and telephone numbers in order to inform them about the dates and times of the groups. A total of 20 older adults agreed to participate in the study. For the selection of the healthcare providers, one of the researchers contacted them in advance by telephone to explain the research and perform the invitation, which was sent by e-mail. Of the 20 healthcare providers invited, only six participated in the study, due to the lack of spare time.

To carry out the study, two focus groups were formed in order to develop the theme, since differences and/or similarities can interfere in the analysis of information. For the intentional sample, the older adults' own experiences in relation to vision changes and the experiences and knowledge of the gerontology professionals about the subject were considered. Accordingly, for this study, two Focus Groups were formed: the 1st with the older adults (FGO) and the 2nd with the healthcare providers (FGP). A meeting was also held with the participants of the focus groups (FGO and FGP), to validate the final result of the two FGs. The focus groups and the meeting were held in a room at the *Instituto Paraibano de Envelhecimento* at the Federal University of Paraíba-UFPB, after the participants consented to participate, on a previously scheduled date and time.

Data collection took place in May 2019, with only one meeting per focus group. Participants totaled 26, 20 in the FGO and six in the FGP, all those who were invited and agreed to participate in the study attended on the scheduled date and time. Each meeting lasted two hours. For the performance of the groups, there was a moderator (Master's degree holder and nurse), with the function of organizing the meeting and encouraging the discussion process; an observer, to synthesize and record the group discussions; and collaborators (one graduate student in nursing, one graduate student in gerontology and two Nursing Doctorate holds). The sessions were audio-recorded, with subsequent transcription and data analysis.

In the FGO, an interview was previously carried out with the participants to characterize the older

adults, considering the following variables: age (in years), sex (female, male), marital status (single, married, separated/divorced, widowed), education (illiterate, can read and write, fundamental education, high school education, higher education), difficulty in one of the five senses, with emphasis on vision and the use of glasses or other orthosis. To conduct the focus group, the following guiding questions were established: Do you have any changes or difficulties in your sense of vision? Which one or which ones? For how long? Have you been to the doctor because of this difficulty? What is the perception in relation to this change or difficulty? Do you know any older adult who has altered vision?

In the FGP, the meeting with the providers followed the same steps as the FGO. To characterize the participants, a questionnaire was used containing the following variables: age (in years), gender (female, male), professional training, time since graduation and occupation. There was a second questionnaire, with eight questions, to identify the experiences of these professionals in caring for older adults with vision impairment. To conduct the focus group, the following guiding questions were used: Have you ever attended an older adult with sensory-visual alteration? What was the difficulty presented by them? How old were they? How long had they had this alteration? Did you find it difficult to provide this older adult with care? What difficulty? Had this older adult already sought professional care to treat this difficulty? Do you know the diagnosis?

The purpose the third meeting was to present the results of the alterations reported by the older adults and the healthcare providers' experiences in a single panel for debate and validation of what had been presented during the sessions and final analysis. All dialogues produced during the focus groups were fully transcribed for data organization and further analysis. Sociodemographic data were entered into an electronic spreadsheet in the Microsoft Excel program. Descriptive statistics and the Inductive Thematic Analysis technique[6] were performed, using the *R pour les Analyses multidimensionnelles de textes et de questionnaires* (IRaMuTeQ) software.[7] The texts produced in the FGs were analyzed using IRaMuTeQ. In the software, the chosen analyses were: 1) Word cloud – formed from the frequency distribution of words and obtained through a lexical analysis simpler than similarity analysis[6]; 2) Similarity analysis – which is based on graph theory, enabling the identification of co-occurrences between the words and the connection between them, as well as the visualization of the representational structure organized through this type of analysis.[7]

All 20 older adults and the six providers signed a consent form, in duplicate, a copy of which was retained by the study participant. This study met all the ethical requirements established in Resolution 466/2012, of the National Health Council, having been approved by the Research Ethics Committee of UFPB (Authorization No. 2.190.153 and CAAE 67103917.6.0000.5188). The research at the CAISI was authorized by the Health Department of João Pessoa and by the Health Education Management.

Results

Characterization of the Focus Group participants

The FGO consisted of 20 older adults, between 70 and 91 years of age; most female. Of these, 19 reported using eyeglasses, more than half (65%) had only completed primary education and half (10) were widowed. In the FGP, participants were six healthcare providers who were directly linked to care activities for older adults, aged between 29 and 52 years, four being female and two male, with the time since graduation ranging between one and 28 years. Among the providers, there were three nurses, a physical educator, a Management and Art technician from the Municipal Health

Department and an Older Adults Club and the coordinator of the Strategic and Participatory Management Support Center of the Municipal Health Department, both responsible for the operative groups of the CAISI. In common, all the providers were studying for master's degrees in the Professional Master's Degree Program in Gerontology at the Federal University of Paraíba.

Focus Group Analysis

In the analysis of IRaMuTeQ, in the FGO, 36 text segments were formed, with a total of 1,272 occurrences, of which 364 words were analyzable. A total of 205 different words were identified with a single occurrence, which corresponds to 56.32% of the total analyzed and 16.12% of the occurrences. In the FGP, 38 text segments were formed, with a total of 1,347 occurrences, of which 642 words were analyzable. A total of 270 different words were identified with a single occurrence, which corresponds to 58.44% of the total analyzed and 20.04% of the occurrences.

In the word cloud, on the left, in Figure 1, the ones with greater visibility and their respective frequencies were: no (f=39); feel (f=26); more (f=26); speak (f=26); difficulty (f=20); year (f=20); listen (f=18); listen (f=17); ear (f=15); cataract (f=15); glasses (f=13); time (f=13); doctor (f=12; surgery (f=12) and understand (f=12). In the right cloud in Figure 1, the words with greater visibility and frequency were: no (f=39); speak (f=24); difficulty (f=24); more (f=17); a lot (f=13); already (f=13); question (f=12); because (f=12); elderly (f=12); be (f=11) and ear (f=10).In the center word cloud, below the two clouds, which is a combination of what was reported in the third meeting, the words with greater visibility and respective frequency were: vision (f=24); difficulty (f=23); see (f=22); cataracts (f=22); glasses (f=19); surgery (f=17); more (f=14); age (f=13); eye (f=12) and no (f=11).

In the maximum tree, Figure 2A, generated from the older adult group, the formation of several nodes (nuclei) stands out, with the words "no", "feel", "more", "difficulty" and "year"; the nodes are linked to other peripheral elements that are related to the difficulties that the older adults had related to vision and to coping with their problems with advancing age. The tree on Figure 2B, which emerged from the providers' statements, has nodes represented by the words "no", "speak", "difficulty" and "more", in the providers' perception, age is permeated by difficulties and losses, with communication being an important element in the comprehension of the problems reported by the older adults. All the elements listed by the tree represent not only the decline in vision due to age, but other senses that may be altered, such as hearing. In the Figure 2C, is the formation of two nodes (nuclei), the first between the words "see" and "difficulty", this node is linked to other peripheral elements that are related to difficulty in seeing, reading and wearing glasses with advancing age. The second node, represented by the words "cataract" and "surgery", was linked to the first by the word "more", which is directly linked to the word "difficulty". All the elements listed by the tree represent the declines in vision due to age.

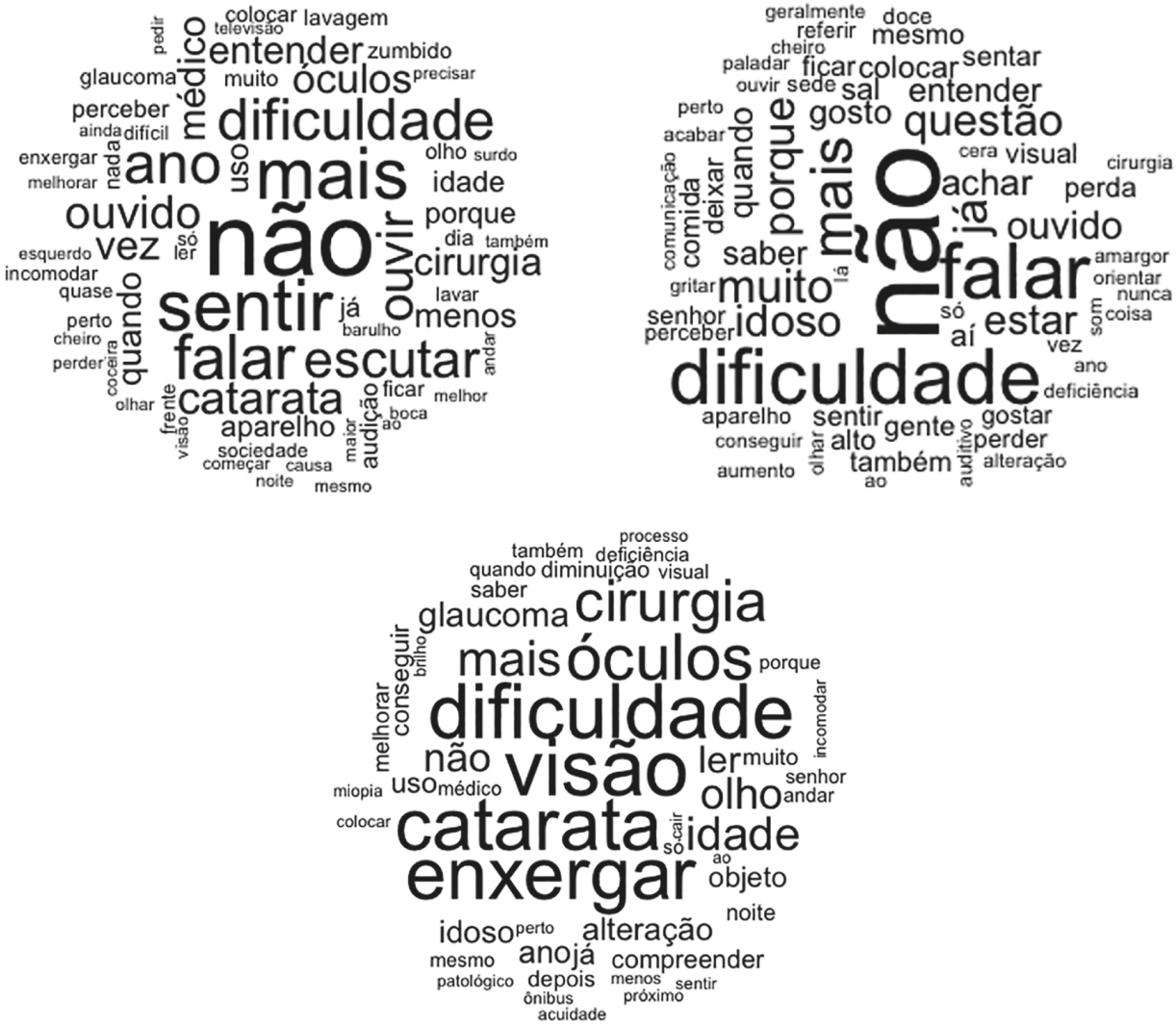

Figure 1. Word clouds formed from the focus groups, the left cloud for the older adult group, the right cloud for the healthcare provider group and below the cloud for the third meeting, João Pessoa, Paraíba, Brazil, 2019

Left: colcar = put; lavagem = wash; televisão = television; pedir = ask; entender = understand; zumbido = tinnitus; muito = a lot; óculos = glasses; precisar need; glaucoma = glaucoma; perceber = perceive; ainda = still; dificil = difficult; enxergar = see; melhorar = improve;nada = nothing; só = only; esquerdo = left; incomodar = trouble; quase = almost; perto = near; cheiro = smell; perder = lose; coceira = itch; olhar = look; frente = front; visão = vision; aparelho = device; sociedade = society; começar = start; causa = cause; noite = night; mesmo = same; maior = bigger; audição = hearing; ao = to; boca = mouth; ficar = stay; melhor = best; andar = walk; barulho = noise; menos = less; lavar = wash; cirurgia = surgery; dia = day; porque = why; idade = age; surdo = deaf; olho = eye; dificuldade = difficulty; não = no; sentir = feel; mais = more; falar = speak; ano = year; escutar = listen; ouvir = hear; ouvido = ear; catarata = cataract; médico = doctor; uso = use; vez = turn; quando = when;

Right: dificuldade = difficulty; geralmente = generally; doce = sweet; referir = refer; mesmo = same; cheiro = smell; sentar = sit; paladar = taste; ficar = stay; colocar = put; ouvir = hear; sede = thirsty; sal = salt; entender = understand; gosto = taste; perto = close; questão = question; acabar = finish; cera = wax; visual = visual; cirurgia = surgery; perda = loss; ouvido = ear; saber = know; gritar = scream; muito = a lot; falar = speak; amargor = bitterness; orientar = guide; nunca = never; coisa = thing; só = only; aí = there; estar = be; vez = turn; ano = year; deficiencia = deficiency; gostar = like; perder = lose; alteração = alteration; gente = people; sentir = feel; alto = loud, também = also; ao = to; aumento = increase; conseguir = manage; aparelho = device; perceber = perceive; senhor = Mr; idoso = older adult; comunicação = communication; comida = food; deixar = leave; quando = when; porque = why; mais = more; não = no; já = already; som = sound;

Center: processo = process; também = also; deficiencia = deficiency; quando = when; diminuaçao = decrease; visual = visual; saber = know; glaucoma = glaucoma; cirurgia = surgery; mais = more; óculos = glasses; porque = why; dificuldade = difficulty; não = no; visão = vision; ler = read; muito = a lot; senhor = Mr; andar = walk; olho = eye; uso = use; medico = doctor; miopia = myopia; colocar = put: catarata = cataract; idade = age; só = only; ao = to; enxergar = see; objeto = object; noite = night; idoso = older adult; perto = close; alteraçao = alteration; mesmo = same; ano = year; já = already; compreender = understand; patológico = pathological; depois = after; menos = less; sentir = feel; ónibus = bus; proximo = next; acuidade = acuity; melhor = better; conseguir = manage; brilho = bright; cair = fall; incomodar = trouble

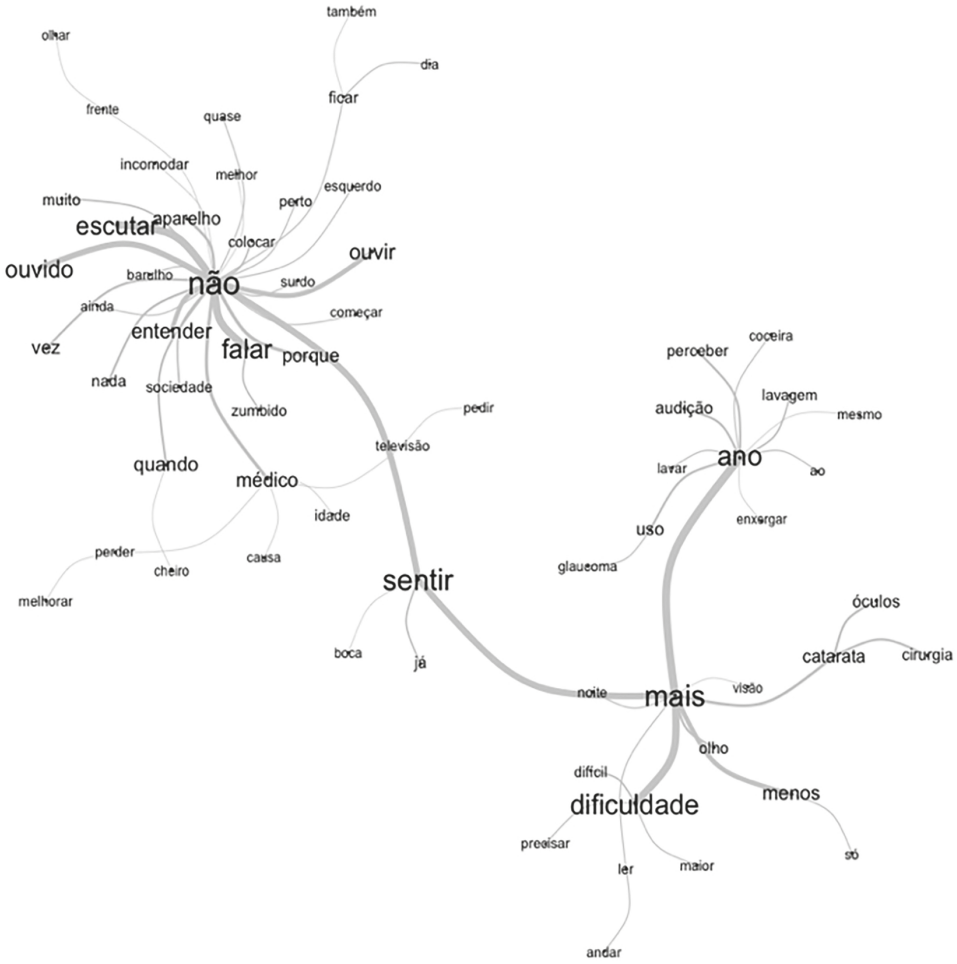

Figure 2A. Tree formed from the older adult group. João Pessoa, Paraíba, Brazil, 2019

não = no; também = also; dia = day; ficar = stay; olhar = look; frente = front; incomodar = trouble; quase = almost; melhor = best; perto = near; colcar = put; aparelho = device; muito = a lot; escutar = listen; surdo = deaf; ouvir = hear; ouvido = ear; barulho = noise; ainda = still; vez = turn; nada = nothing; entender = understand; sociedade = society; quando = when; médico = doctor; zumbido = tinnitus; falar = speak; porque = why; cheiro = smell; perder = lose; melhorar = improve; causa = cause; idade = age; televisão = television; pedir = ask; esquerdo = left; **sentir = feel**; boca = mouth; já = already; **ano = year**; coceira = itch; perceber = perceive; lavagem = wash; mesmo = same; audição = hearing; lavar = wash; uso = use; glaucoma = glaucoma; enxergar = see; ao = to; **mais = more**; olho = eye; noite = night; visão = vision; menos = less; só = only; óculos = glasses; catarata = cataract; cirurgia = surgery; dificuldade = difficulty; **dificil = difficult**; ler = read; maior = bigger; andar = walk; precisar = need.

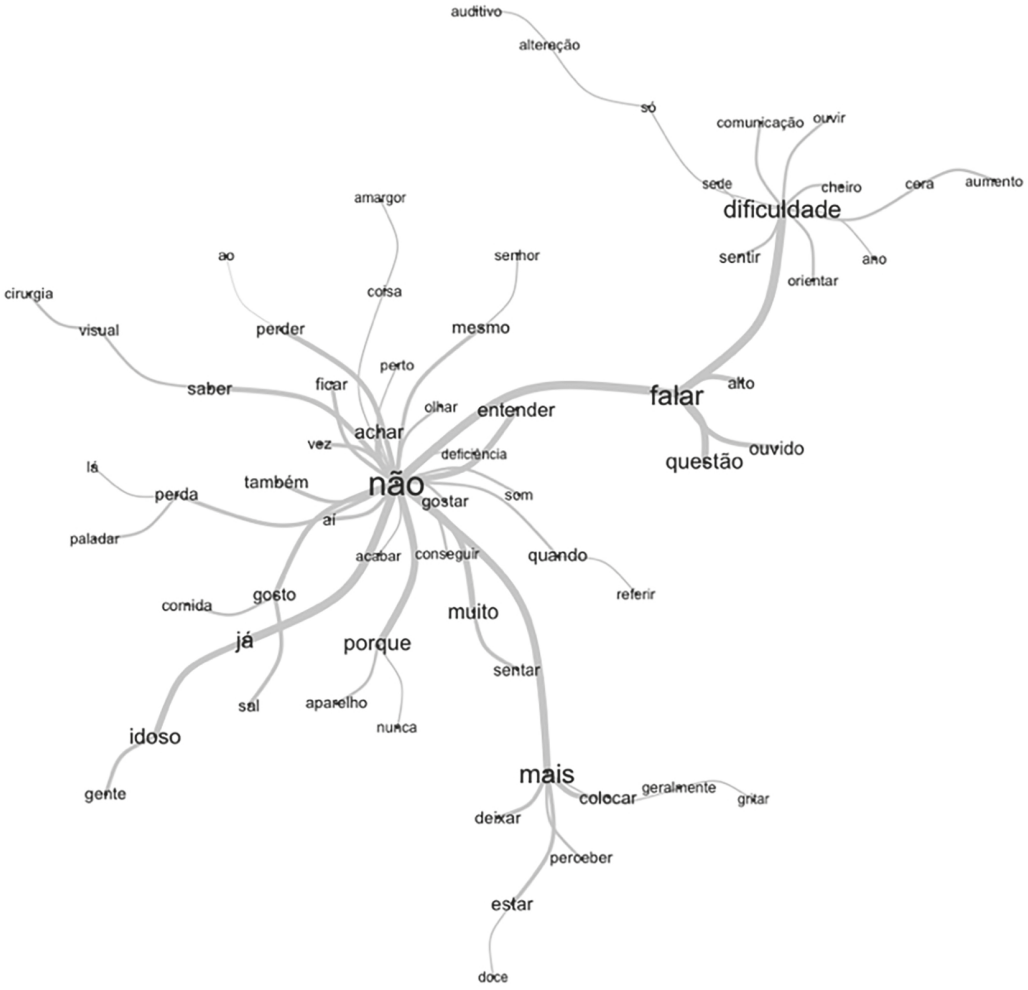

Figure 2B. Tree for the healthcare provider group. João Pessoa, Paraíba, Brazil, 2019

dificuldade = difficulty; sede = thirsty; só = only; alteração = alteration; auditivo = auditory; comunicação = communication; ouvir = hear; sentir = feel; orientar = guide; ano = year; cera = wax; aumento = increase; cheiro = smell; **falar = speak**; alto = loud; questão = question; ouvido = ear; **não = no**; olhar = look; senhor = Mr; mesmo = same; perto = close; amargor = bitterness; coisa = thing; ao = to; perder = lose; achar = find; ficar = stay; vez = turn; saber = know; visual = visual; cirurgia = surgery; também = also; perda = loss; paladar = taste; lá = there; comida = food; gosto = taste; aí = there; já = already idoso = older adult; gente = people; sal = salt; porque = why; aparelho = device; nunca = never; sentar = sit; muito = a lot; conseguir = manage; referir = refer; quando = when; gostar = like; entender = understand; deficiencia = deficiency; som = sound; acabar = finish; **mais = more**; deixar = leave; colocar = put; geralmente = generally; gritar = scream; perceber = perceive; estar = be; doce = sweet.

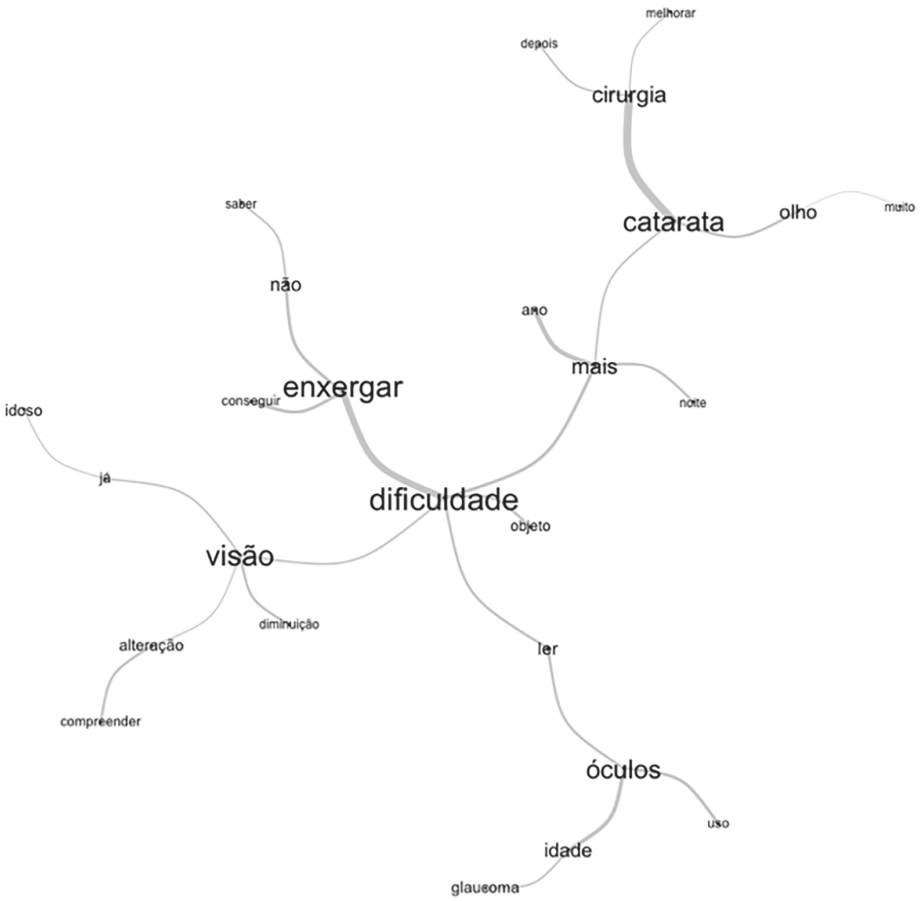

Figure 2C. Tree formed from third meeting. João Pessoa, Paraíba, Brazil, 2019

dificuldade = difficulty; objeto = object; **óculos = glasses**; ler = read; uso = use; idade = age; glaucoma = glaucoma; visão = vision; diminuaçao = decrease; alteraçao = alteration; compreender = understand; já = already; idoso = older adult; **enxergar = see**; conseguir = manage; não = no; saber = know; **mais = more**; ano = year; noite = night; **catarata = cataract**; olho = eye; muito = a lot; cirurgia = surgery; melhor = better; depois = after

Discussion

From the perceptions of the older adults and healthcare providers who worked with older adults, it was possible to visualize how changes related to vision are reported and perceived by the different groups. However, when viewing the results, many common points permeated the reports. In view of the main physiological changes in vision perceived by the older adults and described by the providers during the care for older adults, the most frequently mentioned words by the participants were evidenced: vision, difficulty; see; cataract; glasses; surgery; more; age; eye and no. This result corroborates the findings of the World Vision Report, according to which visual impairment is observed in 80% of cases from 50 years of age onwards.[8] The participants' statements denote that the onset of diseases related to vision such as cataracts, retina, glaucoma, myopia, correction and degeneration are common in aging. Researchers from Nepal concluded that, with population aging, retinal diseases are the main cause of blindness.[9] It is important to highlight that the older adults experience the problem and report it frequently.

The older adults, in addition to reporting difficulties related to vision, also reported declines in other senses. In the literature, the difficulty in seeing nearby objects is reported as being common among older adults, which makes it difficult, for example, to read.[10] This change is due to aging, such as age-related macular degeneration, which still has no possible treatment and has been receiving more attention recently due to the high prevalence figures and the negative effect it imposes on the quality of life.[8] Access to the use of eyeglasses and surgery is an important factor in people's quality of life, as these allow for the necessary correction, as well as the reduction of the alarming numbers of people with visual impairment and blindness.[11] The main causes of visual impairment and blindness are the reversible changes that greatly affect the older population and that are treatable with surgery, glasses or contact lenses, mainly cataracts and refractive errors.[12,13]

Other words indicated that the providers' concern should not only be with identifying the problem and concluding a diagnosis, with it also being necessary to consider the complications of visual decline as alterations in the quality of life and social aspects.[14] In the focus group cloud words such as bus, fall, night, glare, feel and walk, related to daily difficulties experienced by the older adults as a result of impaired vision, were also identified. In the literature, these words are cited by older adults with senile cataract, who need a greater amount of light to see better, especially at night, in addition to denoting decreased acuity, blurring, distortion, and loss of brightness and color.[15]

Older adults, faced with the difficulty of seeing or even the lack of vision, may present depression and anxiety, limited mobility, cognitive decline, dementia, and a greater risk of falls, fractures and mortality, as well as other consequences such as institutionalization.[16-22] In Germany, researchers warned of the need to promote eye care for older adults. The authors found, in addition to ocular disorders increasing with age, severe visual impairment and blindness in 136 older adults out of 600 respondents, particularly due to age-related pathologies, such as age-related macular degeneration, cataracts and glaucoma.[23]

In addition to the difficulties involved in the participation of the older adults in activities outside their homes, other themes arising from words such as "analysis", "evaluation", "vision", "examination", "doctor" and "evaluation" should be focused on, as these are part of the routines of health services. The presence of these words is in line with some findings in the literature, such as those reported in a study carried out in Fortaleza with 172 older adults treated at an Urgency and Emergency Hospital. According to the study, 28.5% of the participants had poor eyesight, with men having the most complaints regarding vision decline.[24]

In the UK, researchers conducted a hospital survey on admissions of people with a secondary diagnosis of glaucoma and hospitalization for falls with or without glaucoma as a secondary diagnosis. The survey considered the period of six years and showed that for every eight falls in older adults, one had glaucoma as an important factor, leading to the need for hospitalization and generating a high personal and financial cost, estimated in the study at around £1.2 million during the period investigated. The authors suggested that there is a greater probability of hospitalization due to falls for patients with glaucoma than among those not affected by this disease (prevalence of 0.85% versus 0.16%.[25]

In the maximum tree, the formation of nodes (nuclei) was identified, with the most significant of them being between the words "visual" and "disability". A secondary node, which should also be noticed, is formed by the words "vision" and "difficulty", which connects to other peripheral elements that emphasize not being able to see and advancing age as factors of visual impairment in seniors. The causes, that is, visual alterations, the object of this study, impose important consequences on the lives of the older adults and their families, as well as on society.[10] In all the analyses, the terms show a connection between "disability" and "visual" and between "difficulty" and "vision". These findings are in accordance with the International Classification of Functioning, Disability and Health (ICF), according to which the use of the term "difficulty" as a qualifier to measure visual function contributes to a better comprehension of the visual impairment-health status.[25]

Linked to the main node, elements related to impaired vision were identified, which can reach the most severe degree, blindness. Accordingly, the assessment should be carried out early, to identify the type of change and, consequently, the appropriate treatment, in order to correct errors or postpone any more serious involvement due to lack of necessary care for changes such as glaucoma, myopia and cataract.[16] Restricted access to eye care, especially in low- and middle-income countries, associated with global aging and changes in people's lifestyles, has significantly contributed to the increase in the number of individuals with visual impairments, according to estimates, this problem is 5% in developed countries and reaches 50% in the poorest regions of the world.[8] This is an important fact, since visual impairment causes negative consequences in people's lives, affecting their routine and quality of life.[20] Regarding these consequences, there are, in the maximum tree, elements that may reflect the concern of providers who care for older adults to identify the main changes related to vision and the consequences of these losses. It is also possible to visualize terms that indicate the reduction of vision as a limiting factor in the life of the older adults, due to the difficulty in seeing objects and reading, characterizing changes in their daily activities.[17]

The results are shown in word clouds, in which it is possible to identify the perception of changes, cited by the older adults such as "trouble", "feel", "understand", "read", "object", "night", "brightness", "difficulty", "fall", "bus", "institutionalize", "social", "life", "quality" and "support" in reference to the individual, family and social implications that change the daily life of this population.

The perceptions of the older adults regarding visual alterations described in the focus groups were related to advancing age and are characterized as the main causes of visual impairment and blindness worldwide. According to the literature, changes that are common in the older adults include: cataracts, refractive errors, especially myopia and presbyopia, age-related macular degeneration, glaucoma, and diabetic retinopathy.[18,19] It should be highlighted that many of these changes appear in all the analyses of this study.

It should also be noted that the tree shows a relationship between several terms that denote that there is an intersection between difficulty in vision,

aging, visual changes and compromised quality of life. These factors constitute a warning for Brazilian researchers, since the country is not prepared to deal with the needs of aging alterations that can generate this clinical condition (visual problems), requiring a continuous and multidisciplinary organization of the health system.[1] A study carried out in the capital of Paraíba with 34 nursing care providers from a university hospital showed that they had difficulties in communicating with visually impaired clients and that this could compromise the care. The researchers reinforced the need for the education organizations to prepare future providers, as well as the encouragement of training by the service providers.[10]

Two limitations of this study can be highlighted: the reduced participation of healthcare providers who work with older adults, although our focus was not on generalizing the results, and the limited number of publications on the physiological visual alterations that affect Brazilian older adults, with no censuses or population studies that show these changes. In our view, the information in this regard is mainly concentrated in textbooks, which makes the development of research in the area urgent. Therefore, the development of research in the field of nursing in ophthalmology is urgently needed. In summary, it is noticeable in the word clouds and in the maximum tree that vision problems are directly related to advancing age and, as a consequence, affect the quality of life of older adults. It should be emphasized that the results obtained in the focus groups, through the statements of both the older adults and the healthcare providers, show how the difficulty of seeing and the problems related to vision directly affect the life of older adults and their activities of daily living, mainly the social aspects.

For older adults, visual difficulties generate impacts both at an individual and collective level, resulting in psychological, social and economic problems, which will directly imply loss of self-esteem, status, occupational restrictions and decrease in income. It is also important to highlight that these situations end up generating dependence, communication problems and loss of autonomy for the older adults, who will depend on others for their routine daily care.[17] Accordingly, this study contributes not only to the work of the providers who care for older adults, but reiterates the need for nursing care providers to be aware of changes in older adults' visual acuity inherent to aging and that can affect the daily lives of these people, with a significant impact on their quality of life. The perception of the older adults and healthcare providers regarding the physiological changes in the older adults' vision throughout the aging process shows how the older adults' vision in this process impacts on their daily lives.

Measures for the implementation of preventive actions and monitoring of older adults regarding visual acuity must be included in the multidimensional assessment in health services, and this information must be recorded and monitored by a multidisciplinary team. Older adults, with their visual alterations are objects of study, however interventions must be implemented to offer them quality of life, even with visual alterations.

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Original article

Relationship between Spiritual Intelligence and Professional Self-concept among Iranian Nurses

Mohsen Hojat[1,3]
https://orcid.org/0000-0003-2446-6035
Zohreh Badiyepeymaiejahromi[2,3]
https://orcid.org/0000-0001-6643-036X

UNIVERSIDAD DE ANTIOQUIA
1803

Relationship between Spiritual Intelligence and Professional Self-concept among Iranian Nurses

Abstract

Objective. To determine the relationship between spiritual intelligence (SI) and professional self-concept (PSC) among Iranian nurses. **Methods.** This is a correlation study. A convenience sampling method was used and 344 nurses were selected from hospitals of Jahrom University of Medical Sciences. Data collection standard tools included two validated scales: Cowin's Nurse Self-Concept Questionnaire (36 items scored ranged from 1 to 8; Maximum score=288; 6 subcategories: General Nurse Self-Concept, Knowledge, Care, Communication, Staff Relation and Leadership) and Abdollahzadeh's SI Questionnaire (29 items scored ranged from 0 to 5; Maximum score=145; 2 subcategories: Relying on the inner core and Understanding and communicating with the origin of the universe. **Results.** The mean total score of PSC was 220.3±30.61 and 120.67±16.13 for SI.

1 Nurse, Ph.D. Assistant Professor. Email: mohsenhojat@yahoo.com
2 Nurse, Ph.D. Assistant Professor. Email: z.badiyepeyma@gmail.com. Corresponding author.
3 Department of Nursing, School of Nursing, Jahrom University of Medical Sciences, Jahrom, Iran.

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There was a significant statistical correlation between PSC (r=0.348, $p<0.0001$) and almost all subcategories and SI. The results of the regression analysis showed that SI predicts 13.3% of the variance of PSC ($p<0.0001$). **Conclusion.** Considering the correlation of SI and PSC among Iranian nurses, it is suggested that strategies be used to train and promote the SI of nurses.

Descriptors: self concept, spiritualism, intelligence, nurses, Iran.

Relación entre la inteligencia espiritual y el autoconcepto profesional entre las enfermeras iraníes

Resumen

Objetivo. Determinar la relación entre la inteligencia espiritual y el autoconcepto profesional entre las enfermeras iraníes. **Métodos.** Se trata de un estudio correlacional. Se utilizó un método de muestreo por conveniencia y se seleccionaron 344 enfermeras de los hospitales de la Universidad de Ciencias Médicas de Jahrom. Los instrumentos de recolección de los datos incluían dos escalas validadas: Cuestionario de autoconcepto de la enfermera de Cowin (36 ítems con puntuaciones que van de 1 a 8; puntuación máxima=288; 6 subcategorías: Autoconcepto enfermero general, Conocimiento, Cuidados, Comunicación, Relación con el personal y Liderazgo) y el Cuestionario de Inteligencia Espiritual de Abdollahzadeh (29 ítems puntuados de 0 a 5; Puntuación máxima=145; 2 subcategorías: Apoyarse en el núcleo interno y Comprender y comunicarse con el origen del universo). **Resultados.** La puntuación total media del Autoconcepto Profesional fue de 220.3±30.61 y de 120.67±16.13 para Inteligencia Espiritual. Hubo una correlación estadística significativa entre el puntaje total de la escala Autoconcepto Professional (r=0.348, $p<0.0001$) y de casi todas sus subcategorías, con la Inteligencia Espiritual. Los resultados del análisis de regresión mostraron que la Inteligencia Espiritual predice el 13.3% de la varianza del autoconcepto profesional ($p<0.0001$). **Conclusión.** Existe correlación entre la Inteligencia Espiritual y el Autoconcepto Profesional entre

las enfermeras iraníes. En este sentido, se sugiere que se utilicen estrategias para formar y promover la Inteligencia Espiritual de las enfermeras.

Descriptores: autoimagen; espiritualismo; inteligencia; enfermeras y enfermeros, Iran.

Relação entre inteligência espiritual e autoconceito profissional entre enfermeiras iranianas

Resumen

Objetivo. Determinar a relação entre inteligência espiritual e autoconceito profissional entre enfermeiras iranianas. **Métodos.** Este é um estudo correlacional. Um método de amostragem de conveniência foi usado e 344 enfermeiras foram selecionadas dos hospitais da Jahrom University of Medical Sciences. Os instrumentos de coleta de dados incluíram duas escalas validadas: Questionário de autoconceito do enfermeiro de Cowin (36 itens com pontuação variando de 1 a 8; pontuação máxima = 288; 6 subcategorias: Autoconceito geral de enfermagem, Conhecimento, Cuidado, Comunicação, Relacionamento com a equipe e Liderança) e o Questionário de Inteligência Espiritual de Abdollahzadeh (29 itens pontuados de 0 a 5; Pontuação máxima = 145; 2 subcategorias: Baseando-se no núcleo interno e entendendo e se comunicando com a origem do universo. **Resultados.** A pontuação total média para o profissional do autoconceito foi de 220.3 ± 30.61 e 120.67 ± 16.13 para Inteligência Espiritual, houve correlação estatisticamente significante entre a pontuação total da escala de Autoconceito Profissional ($r = 0.348$, $p < 0.0001$) e quase todas as suas subcategorias, com Inteligência Espiritual. Os resultados da análise de regressão mostraram que a Inteligência Espiritual prediz 13.3% da variância do autoconceito ou profissional ($p < 0.0001$). **Conclusão**. Existe uma correlação entre Inteligência Espiritual e Autoconceito Profissional entre os enfermeiros iranianos,

Descritores: autoimagem; spiritualismo; inteligência; enfermeiras y enfermeiros; Iran.

Introduction

The importance of professional self-concept (PSC) in nursing studies has been recognized.[1] The nursing PSC is defined as the nurse's emotions to her/himself which is influenced by the characteristics, regulations, and values of the nursing discipline. It leads to individual thinking, acting, and feeling like a nurse.[2] Ignoring the importance of PSC can be harmful to the nursing profession because positive PSC plays an important role in shaping the professional identity.[3] It can increase the efficiency of the individual profession, increase job satisfaction, and predict the newly graduated nurses stay in the nursing profession.[4] But when PSC is not developed, job burnout[5] and workplace bullying will increase,[6] and patient safety will decrease.[7] The results of a study revealed that various factors such as nursing education, nursing image, professional values, and sociocultural environment can affect PSC.[7] Since PSC is a complex, and context-based phenomenon, all related variables need to be studied.[8]

Spiritual intelligence (SI) is one of the controversial and novel topics that has been developed because of the interest and attention of researchers.[9] SI does not consider a specific religious propensity. It is a type of ability that causes self-control, self-consciousness, increased peace, purposefulness, profound understanding of life meaning, and constructive communication with others.[10] SI has been explained as the potency to do with cognition and humanity while retaining internal and external tranquility, disregard the situation.[11]

Awareness and understanding of SI can be an important strategy for promoting human resources in the workplace.[12] SI helps nurses to give meaningful services, and cope better with work pressures.[13] It also allows nurses to achieve fundamental life goals, and produce individual meanings. Nurses with a higher SI not only can respond appropriately in specific situations, but also they can understand why they are in that situation, and how to adapt it.[14] Similar to PSC, SI correlates with job satisfaction,[15] and nursing care behavior.[16] According to the introduction nurses' SI and PSC are among the important factors that can affect the way patients are cared for.[7,16] All Iranian nurses in this study are Muslim. SI and PSC are related to the socio-cultural, and religious conditions of countries. Because individuals are influenced by their context interpretation of personal and professional life experiences.

A review of previous research shows that few studies on these two variables have been done separately, but no research has been found on the subject of PSC and SI. Considering that SI is one of the important issues that can be affected PSC, so this study aims to determine the relationship between PSC and SI among Iranian nurses. Emphasizing the inner characteristics of nurses and examining the SI of them can provide valuable information about their PSC.

Methods

Study Design. This is a descriptive-correlational study, which was conducted in 2019 in teaching hospitals (Motahari, and Pymanie) affiliated with Jahrom University of Medical Sciences in Iran.

Participants. 344 nurses from general and intensive wards participated in the study by convenient sampling method. The inclusion criteria were at least six months of work experience, bachelor's degree, and staff nurse. Exclusion criteria were incomplete completion of the questionnaire.

Data gathering. The second author referred to the general and intensive wards of Motahari and Peymaneh hospitals in different shifts (the morning, evening, and night) between August and September 2019. The author invited nurses to participate in the study and obtained their consent. Then the author distributed the questionnaires among the nurses to complete in their free time. The completed questionnaires were collect by the author.

Variables. The following questionnaires were used to collect research data: (i) Nurse Self-concept Questionnaire (NSCQ): Cowin's 36 items questionnaire includes six subscales such as general nurse self-concept, knowledge, care, staff relation, communication, and leadership. Each item was positively grad based on the 1-8 Likert scale. The range of scores is 36-288. Higher scores show better PSC (17). In the study of Zencir *et al.*[18] in Turkey, content validity, construct validity, convergent validity and discriminant validity was confirmed. Cronbach's alpha of this questionnaire was reported in different dimensions between 0.83-0.91. The validity and reliability of the Persian version of this questionnaire have also been confirmed. In the study of Badiyepeyma *et al.*,[19] the correlation coefficients of Spearman-Brown and Cronbach's alpha were 0.84 and 0.97, respectively. All subscales had a moderate or strong correlation and significant relationship with each other, which indicates the construct validity of this questionnaire; (ii) SI Questionnaire: This questionnaire was designed in Iran by Abdollahzadeh *et al.*[20] with 29 items. It has two subscales contains "understanding and communicating with the origin of the universe" with 12 questions, and "spiritual life or relying on the inner core" with 17 questions. Each item has been graded on a Likert scale from 1 to 5 (strongly disagree, disagree, somewhat, agree, and strongly agree). Scores range were 29 to 145. This questionnaire has been developed according to the cultural characteristics of Iranian society. Its validity and reliability have been confirmed. To evaluate the validity, in addition to the content and face validity of the questions, which were confirmed by experts, factor analysis was used and the correlation of all questions was above 0.3. The reliability of this questionnaire was 0.89.

Statistical methods. The data were analyzed based on descriptive (frequency, percentile, mean and standard deviation), and analytical statistics by SPSS.v.21 statistical software. The significance level was appointed 0.05. The normality of variables was evaluated by the Kolmogorov Smirnov test ($p>0.05$). Pearson Correlation test was used to examine the relationship between SI and PSC. Multivariate regression analysis (Enter model) was used to predict students' PSC based on the SI.

Ethical Considerations. This article is the result of a research project approved by the Ethics Committee at Jahrom University of Medical Sciences (IR.JUMS.REC.1393.142). The Helsinki Statement was followed in the study. Before starting the research, participants were informed about the goals of the research. Written consent was signed. The questionnaires were anonymously, and all data would be kept confidential.

Results

344 nurses participated in the study. The mean and standard deviation of age and work experience were 28.44±6.58, 5.63±5.78 respectively. Most nurses were female (71.5%). Some socio-demographic statistics values are presented in Table 1. The mean of PSC was 220.3±30.61, and the mean of SI was 120.67±16.13 (Table 2).

There was a significant statistical correlation between PSC and SI (Pearson Correlation=0.34, Sig 2-tailed <0.0001) and for all subcategories of PSC and SI except leadership subcategory (Table 3).

One-way variance ANOVA analysis reveals that variables are eligible for multivariate linear regression testing (df=2, F=25.996, p-value<0.0001). According to the results of Table 4, the significance level of understanding and communicating with the origin of the universe is higher than the significance level (0.05). Consequently, in this dimension, the understanding and communicating with the origin of the universe is estimated to be the same, and the assumption of the test based on the difference in variables not accepted in a 95% confidence interval. However, the significance level of relying on the inner core is less than (0.05). Predictor variables can predict 13.3% of PSC variance.

Figure 1 shows a positive linear relationship and the residuals are relatively normally distributed.

Table 1. Socio-demographic characteristic of 344 nurses

Variable	Frequency	Percent
Gender		
Male	98	28.5
Female	246	71.5
Level of Education		
Bachelor of Science	327	95.1
Master of Science	17	4.9
Job Position		
Head nurses	36	10.5
Staff	308	89.5
Ward		
General	240	69.77
Intensive	104	30.23

Table 2. descriptive analysis of PSC and SI score

Scale / subcategories	Mean	Std. Deviation	Std. Error of Mean	Variance	Min	Max
Professional Self-concept (PSC)	**220.30**	**30.61**	**1.65**	**937.39**	**87**	**287**
General Nurse Self-Concept	37.20	8.02	0.43	64.45	6	48
Knowledge	29.22	7.59	0.40	57.73	12	48
Care	39.29	5.53	0.29	30.68	23	48
Communication	40.64	5.86	0.31	34.42	11	48
Staff Relation	39.38	6.97	0.37	48.68	6	48
Leadership	34.47	10.69	0.57	114.37	6	96
Spiritual Intelligence (SI)	**120.66**	**16.13**	**0.872**	**260.23**	**60**	**145**
Relying on the inner core	68.933	9.73	0.524	94.79	41	85
Understanding and communicating with the origin of the universe	51.728	7.41	0.401	54.94	17	60

Table 3. Relationship between subcategories of PSC and SI

PSC \ SI	Understanding and communicating with the origin of the universe	Relying on the inner core
General Nurse Self-Concept	r=0.361 *p*<0.001	r=0.309 *p*<0.001
Knowledge	r=0.227 *p*<0.001	r=0.183 *p*=0.001
Care	r=0.178 *p*<0.001	r=0.117 *p*=0.031
Communication	r=0.338 *p*<0.001	r=0.263 *p*<0.001
Staff Relation	r=0.0399 *p*<0.001	r=0.293 *p*<0.001
Leadership	r=0.076 *p*=0.161	r=0.038 *p*=0.485

Table 4. Multivariate regression analysis of the Enter model for predicting PSC through subcategories SI

Variables	B	SE	Beta	t	*p*-value
Constant	141.67	11.71		12.09	<0.0001
Relying on the inner core	1.15	0.24	0.36	4.72	<0.0001
Understanding and communicating with the origin of the universe	-0.011	0.32	-0.003	-0.03	0.972
$R=0.365^a$ $R^2 = 0.133$ Adjusted $R^2 = 0.128$					

a. Predictors: (Constant), understanding and communicating with the origin of the universe, relying on the inner core

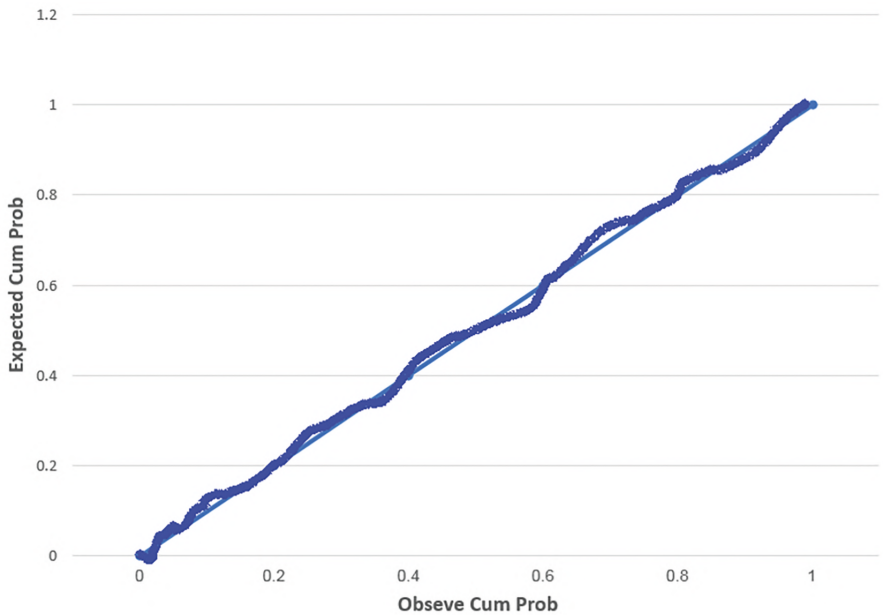

Figure 1. Normal P-P plot of regression standardized residual

Discussion

The results of this study showed that SI is related to nurses' PSC and SI explains 13.3% of the changes in PSC. Since no similar study was found to compare the correlation of PSC based on SI, the results of the present study were compared with related studies of SI and PSC. The results of Mosayebi *et al.*[21] showed that there is a negative linear correlation between job stress and nurses' PSC. As a result, with the reduction of job stress in nurses, their PSC increases. SI training is an effective way to reduce stress[22] and increase job satisfaction of nurses,[23] so using SI training has

been suggested to reduce job stress and increase job satisfaction. According to the results of the above studies, it can be concluded that SI plays a role in increasing the PSC of nurses by reducing job stress and increasing job satisfaction.

In this regard, the result of Ebrahimi Barmi *et al.*[9] showed that there is a significant relationship between spiritual intelligence and resiliency. According to Sahebalzamani *et al.,*[24] there is a significant relationship between SI with nurses' psychological well-being and having a purpose in life. So SI aids nurses to meliorate their psychological well-being and have a goal in life that may guide to the health procurement of them and patients.

The study of Rani *et al.*[25] also showed that there was a positive correlation between SI and nurses' job performance. The nurses with higher SI had better performance in their work. Based on the descriptions of SI, it can be concluded that people with high SI have more ability and flexibility, which is effective in improving job performance. SI helps people to do difficult things and makes their job difficulties an opportunity to help other people and be altruistic. On the other hand, SI by emphasizing positive inner and constructive motivations can also strengthen the PSC of nurses. Therefore, high SI both improves the job performance of nurses and, in turn, can improve the PSC. Also, the results of the studies have shown that SI is one of the factors affecting nurses' caring behaviors. In this regard, the study of Kaur *et al.* in Malaysia[16] also showed that promoting SI and strengthening nurses' beliefs can help improve the quality of patient care. The SI helps people to have a better understanding of goals and the right ways to achieve goals and to choose the right motivational orientations in life.

Findings of another study also showed a significant relationship between interest in the nursing profession and SI.[26] Thus, the people who enter the nursing discipline with interest have a higher SI. It seems that SI can increase the problem-solving ability and flexibility against problems also dealing with stressful situations by nurses, and the reason for this is the better adaption to the conditions and work environment of nursing among interested people. It seems that people with higher SI are more likely to use adaptive problem-solving skills and use spiritual resources to solve problems in their daily lives and give meaning and value to their daily affairs. These people also use behaviors such as forgiveness, self-sacrifice, self-control, and sanctifying daily affairs more, and in this way, they can solve problems better, so they will have a high PSC.

Another study also showed the relationship between SI and happiness in nurses.[27] The activities that nurses do in search of spirituality, such as helping others and caring for them can lead to happiness, and the belief that there are prominent forces and destinations in the world that can increase people's happiness and thus can affect their PSC positively. Nurses have their own beliefs and the mental image of their situation that they reflect in some way in their minds. This mental image is created by personal experiences and the impact of the professional world on the individual. According to this, they evaluate their life and profession and try to deal with it, so SI can affect PSC by influencing the feeling of happiness.

The present study had some limitations. This study was conducted only in educational hospitals of Jahrom University of Medical Sciences. The questionnaires were used to collect data. Although the present study is correlational and predictive, it suggested that other related variables can predict most changes in PSC examined. Also, pay more attention to experimental studies in this regard. SI is a predictive factor in the PSC of nurses. But this prediction was not high, so other factors for increasing PSC must be considered. According to the findings, SI is related to PSC and its dimensions. People with high SI have a holistic view of life and a greater ability to solve problems by enjoying positive moral virtues. Because nurses face many problems and stresses on a workday, SI can improve PSC and the quality of

care. Therefore, the results of this study show the need to improve the level of SI of clinical nurses. Improving the SI of nurses during their education and presenting continuing education programs in this regard is recommended. This result could help professional staff, like physicians, pastoral/spiritual care providers, social workers, and psychologists, to promote SI and PSC.

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Original article

Self-perception of nurses' competence in family assessment and intervention

Maria Henriqueta Figueiredo[1,5]
https://orcid.org/0000-0001-7902-9751

Maria Manuela Ferreira[2,5]
https://orcid.org/0000-0003-0019-9534

Marlene Lebreiro da Silva[3,5]
https://orcid.org/0000-0001-8327-424X

Virgínia Sousa Guedes[4,5]
https://orcid.org/0000-0002-9654-3303

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Self-perception of nurses' competence in family assessment and intervention

Abstract

Objective. To describe nurses' self-perception of competence in family assessment and intervention. **Methods.** A sample of 551 Portuguese primary care nurses was selected. A Likert-type questionnaire with 11 items corresponding to the areas of care proposed by the Dynamic Model of Family Assessment and Intervention (MDAIF) was administered. Each item consists of 7 optional responses; a score equal to or greater than 4 denotes competence. **Results.** The nurses perceived themselves as competent in areas of care belonging to the development dimension of the MDAIF (parental role, adaptation to pregnancy, and family planning), as well as in the caregiver role (which belongs to the functional dimension). There was a progressive decline in self-perception of competence over the stages of the nursing process. **Conclusion.** In this study, crucial aspects related to nurses' self-perception of their competence in family

1 Nurse, Ph.D. Professor, Coordinator of Escola Superior de Enfermagem do Porto, Portugal. Email: henriqueta@esenf.pt. Corresponding author
2 Nurse, Ph.D. Adjunct Professor at Escola Superior de Saúde Norte da Cruz Vermelha Portuguesa. Email: manuela.ferreira@ essnortecvp.pt
3 Family Nurse. Family Nurse at grupamento de Centros de Saúde Porto Ocidental, Portugal. Email: enfmarlenelebreiro@gmail.com
4 Nurse, Master's. Family Nurse at Agrupamento de Centros de Saúde Tâmega I – Baixo-Tâmega, Portugal.
5 Center for Research in Healthcare Technologies and Services, Portugal.

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assessment and intervention were observed, and need to be addressed in the training of nurses in all areas of care included in the Model. This should facilitate awareness of the competences needed to provide the best care for families.

Descriptors: primary health care; nursing process; family nursing.

Autopercepción de la competencia del enfermero en la valoración e intervención familiar

Resumo

Objetivo. Describir la autopercepción de la competencia del enfermero en la valoración e intervención familiar. **Métodos.** Estudio exploratorio descriptivo de naturaleza cualitativa. Se seleccionó una muestra de 551 enfermeros portugueses de atención primaria. Se utilizó un cuestionario con opciones de respuesta tipo Likert, con 11 ítems correspondientes a las áreas de atención propuestas por el Modelo Dinámico de Evaluación e Intervención Familiar. Cada ítem tiene 7 opciones de respuesta, y se considera competente un valor igual o superior a 4. **Resultados.** Los enfermeros se autoperciben como competentes en las áreas de atención de la dimensión de desarrollo del Modelo (rol parental, adaptación al embarazo y planificación familiar), así como en el rol de brindar cuidados, en el que se realza que esta última área está integrada en la dimensión funcional. Se destaca también la disminución progresiva de la autopercepción a lo largo de las etapas del proceso de enfermería. **Conclusión.** En este estudio se observó que hay aspectos cruciales relativos a la autopercepción de la competencia de los enfermeros en la evaluación e intervención familiar que necesitan ser intervenidos en la formación de estos profesionales en todas las áreas de cuidados del Modelo, lo que facilitará la concienciación de las habilidades necesarias para proporcionar los mejores cuidados a las familias.

Descriptores: atención primaria de salud; proceso de enfermería; enfermería de la familia.

Autopercepção da competência do enfermeiro na avaliação e intervenção familiar

Resumo

Objetivo. Descrever a autopercepção da competência do enfermeiro na avaliação e intervenção familiar. **Métodos.** Foi selecionada uma amostra de 551 enfermeiros portugueses dos cuidados de saúde primários. Foi utilizado um questionário com opções de resposta tipo Likert, com 11 itens correspondentes às áreas de atenção propostas pelo Modelo Dinâmico de Avaliação e Intervenção Familiar. Cada item integra 7 respostas opcionais, sendo considerado competente um valor igual ou superior a 4. **Resultados.** Os enfermeiros autopercionaram-se como competentes, em áreas de atenção da dimensão de desenvolvimento do MDAIF (papel parental, adaptação à gravidez e planeamento familiar), assim como no papel de prestador de cuidados, realçando-se que esta última área está integrada na dimensão funcional, destacando também uma progressiva diminuição da autopercepção ao longo das etapas do processo de enfermagem. **Conclusão.** Neste estudo observou-se que existem aspectos cruciais relacionados à autopercepção da competência do enfermeiro na avaliação e intervenção familiar que precisam ser tratados na formação do enfermeiro em todas as áreas de cuidado do Modelo, facilitando a conscientização de competências necessário para proporcionar o melhor cuidado às famílias.

Descritores: atenção primária à saúde; processo de enfermagem; enfermagem familiar.

Introduction

Primary health care (PHC) focuses on health promotion and protection and on preventive activities designed to identify risk factors for health. Health surveillance, management and care planning in the health system aim to empower individuals, families, or communities with regard to lifestyle decisions.[1] The main objective of PHC reforms is to strengthen the health system, given that its quality determines the health of populations. From this perspective, health policies aim to obtain the best outcomes by integrating quality improvement in the provision of care as well as increasing effectiveness, so that PHC can provide effective responses to the population's needs.[2,3] the growing requirement for PHC is closely associated with demographic changes, as well as with greater diversity of family arrangements and interactions, leading to a need to adapt this level of care to the new profile of changing populations. [4] Special emphasis is given to changes in family structure related to the last stage of the family life course, characterized by aging-related transitions.

The prevailing concept of care influences the quality of the provision of nursing care, enabling acquisition of practical skills based on the assimilation and mastery of nursing core content. Theoretical models also provide a foundation from which knowledge of the field of nursing can be both observed and developed.[5] The Dynamic Model of Family Assessment and Intervention (MDAIF) is a theoretical-methodological framework for the provision of family-centered nursing care. It was developed through action research on the practices of PHC family nurses,[6] and was designed to add to the knowledge base of family nursing and inform the clinical practice of family nurses. Implementation of this framework has been perceived by nurses as essential to improve the quality of clinical practice.[7] Its assumptions and principles focus on the resources and strengths of families through a collaborative approach that seeks to empower families.[8]

The MDAIF consists of an operational matrix, with diagnoses and interventions linked to the following dimensions: structural (family income; residential building; safety precaution; water supply; household pets); developmental (marital satisfactions; family planning; adaptation to pregnancy; parental role) and functional (caregiver role; family process). This matrix describes the areas of family assessment and intervention according to the nursing process methodology: family assessment, diagnosis, planning of interventions, and evaluation of the results of implementation. The nursing process methodology can be understood as the process of articulating between management and care provision in order to respond to the client's needs.[9] It is a systematic technique for data collection, definition of diagnoses, planning, implementation, and evaluation of the care provided. The effectiveness of interventions can be compromised when implementation of the nursing process is inadequate.[10]

The provision of care centered on families' needs entails that nurses be competent in deploying nursing process methodology, as well as in assimilating the assumptions and clinical guidelines of nursing models. The implementation of competence acquisition and development strategies will contribute greatly to the continuous improvement of the provision of nursing care, considering the concept of competence as the ability to integrate resources and knowledge and mobilize these elements for effective action, leading to an active restructuring of knowledge.[11] If the perception of personal competence occurs in relationship with work, "perception" refers to the assessments people make based on their social representations, associated with the circulation and transformation of ideas in society, allowing the preservation of a rewarding personal and social identity.[6]

The aim of this study is to describe nurses' self-perception of competences in family assessment and intervention, considering the stages of the nursing process. The results of this study seek to contribute to identification of the most common practices of nurses when care becomes family-centered, as well as of self-perception of competence in key areas for the provision of care. These results are certain to also enable identification of training needs and thus lead to an improvement in the quality standards of nursing care provided in the context of PHC.

Methods

Study setting and population. This is an exploratory, descriptive, quantitative study. The participants were nurses working in integrated primary health units in Portugal. The sample included 551 nurses working in PHC in the North of Portugal. The sample was non-probabilistic, and considered the following inclusion criteria: 1) nurses without postgraduate training in family health nursing; and 2) nurses who applied to the MDAIF Framework for Decision Making in Family Nursing course.

Instruments and data collection. Data were collected through a questionnaire based on the operational matrix of the MDAIF, namely with regard to areas of care which cut across all stages of the nursing process. Content validity was attested through expert consensus and pre-testing. No changes were required after this stage, confirming the clarity and relevance of the original items. This instrument was developed in 2012 with a sample of 161 nurses working in Portugal, recruited with the same inclusion criteria.[7] The questionnaire includes items designed to collect sociodemographic and professional data. It includes questions related to assessment of the respondent's self-perception of competence regarding family assessment and intervention at each stages of the nursing process, based on the areas of care defined for the operational matrix of the MDAIF.[6,13] A Likert-type scale was used for this part of the questionnaire, with 7 response choices, anchored at 1 ("totally incompetent"), 4 ("competent"), and 7 ("totally competent"). Each of the 11 items corresponded to an area of care defined in the MDAIF, conceptualized in its components and operationalized in its operational matrix, taking into account all stages of the nursing process.[6] The questionnaire was self-administered, and data collection was carried out during the year 2020.

Statistical analysis. Statistical analyses were performed in SPSS Version 23.0 for Windows (SPSS Inc., Chicago, IL, USA). Categorical variables were described as absolute and relative frequencies, and continuous variables, as mean and standard deviation (SD) or median and interquartile range (IQR = P75-P25) as appropriate. To determine the total self-perceived competence for each stage of the nursing process, the sum of the items corresponding to each stage of the nursing process was independently calculated and divided by 11 (number of items corresponding to each step of the evaluated nursing process).

Ethical considerations. All ethical considerations and principles were followed and anonymity was ensured, and participation was entirely voluntary and informed. Participants were asked to sign an informed consent form and were informed that they could withdraw from the study at any time during their participation. Participants received all necessary information about the study before enrollment, and were given the opportunity to elucidate any doubts. The study was part of a research protocol between the institution of higher learning where the MDAIF project was developed and the health facilities where the participants work. Once the relevant ethics committee had approved the conduction of the study, institutional authorization was formalized in document No. 217/2019.

Results

Sample profile. The sample comprised 551 nurses. Most participants were female (89.5%), aged between 23 and 61 years, with a mean age of 39.27 years (SD = 7.23 years). Regarding academic background, the majority of participants had a bachelor's degree in nursing (n = 478, 86.4%); 60 had a master's degree (10.8%) and 44 held a doctorate (0.7%). There was great heterogeneity in the sample regarding the overall duration of nursing practice, which ranged from 1 year to 39 years, with an average of 15.8 years (SD = 7.28 years). The average number of years of professional practice in PHC specifically was 10.8 years (SD = 7.1 years), ranging from less than 1 year to 37 years.

Self-perception of competence in family assessment and intervention at each stage of the nursing process:

Needs assessment and diagnostic formulation

In relation to most items, participants perceived themselves as competent, whether in identifying needs or in stating the diagnosis, with mean values close to 4 on the Likert scale. According to Table 1, the lowest average value was found for family income, followed by marital satisfaction and water supply.

Regarding self-perception of competence in nursing diagnosis, the items with an average value of less than 4 were, in ascending order: family income, household pets, residential building, water supply, marital satisfaction, family process, and safety precaution. At this stage, safety precaution and family process presented average values close to 4, but lower than those obtained in the previous stage of the nursing process (needs assessment).

Planning, implementation and evaluation of interventions

The items that showed the highest mean score for self-perceived competence in planning interventions (Table 2) were family planning and adaptation to pregnancy. All other items had an average score of less than 4, with the lowest average value for family income. At the implementation of interventions stage of the nursing process (Table 2), the best self-perception of competence was observed for the same items as in each of the previous stages of the nursing process—in ascending order, with an average score greater than 4: parental role, adaptation to pregnancy, family planning, and caregiver role.

At the evaluation of interventions stage (Table 2), the items with the best self-perceived competence scores were again the same as in each of the previous stages, presented in ascending order according to the degree of agreement with self-competence (average score greater than 4): parental role, adaptation to pregnancy, family planning, and caregiver role. Items at the evaluation of interventions stage were also organized in descending order according to the degree of self-perceived competence of implementation: family process, safety precautions and marital satisfaction, household pets, residential building, water supply and, finally, with the lowest average self-perception score, family income.

Table 1. Self-perception of competence in family assessment and intervention at two stages of the nursing process: needs assessment and nursing diagnosis

Items	Needs assessment			Nursing diagnosis		
	n	Mean (SD)	Median (IQR)	*n*	Mean (SD)	Median (IQR)
Item 1 Family income	551	3.52 (1.37)	4 (1)	549	3.34 (1.29)	4 (2)
Item 2 Residential building	550	3.86 (1.36)	4 (1)	549	3.55 (1.31)	4 (1)
Item 3 Safety precaution	551	4.05 (1.24)	4 (1)	550	3.83 (1.29)	4 (1)
Item 4 Water supply	549	3.89 (1.55)	4 (2)	550	3.55 (1.48)	4 (1)
Item 5 Household pets	551	3.85 (1.50)	4 (1)	549	3.53 (1.37)	4 (1)
Item 6 Marital satisfaction	551	3.79 (1.36)	4 (1)	550	3.67 (1.33)	4 (1)
Item 7 Family planning	549	4.35 (1.21)	4 (1)	549	4.29 (1.31)	4 (1)
Item 8 Adaptation to pregnancy	551	4.54 (1.30)	4 (2)	549	4.29 (1.30)	4 (1)
Item 9 Parental role	551	4.53 (1.27)	4 (1)	549	4.27 (1.29)	4 (1)
Item 10 Caregiver role	550	4.64 (1.23)	4 (2)	549	4.36 (1.25)	4 (1)
Item 11 Family process	550	4.02 (1.34)	4 (2)	548	3.82 (1.31)	4 (1)
Total score	545	4.08 (1.03)	4 (1)	542	3.85 (1.07)	4 (1)

Table 2. Self-perception of competence in family assessment and intervention at three stages of the nursing process: planning, implementation and evaluation of interventions

Items	Planning of interventions			Implementation of interventions			Evaluation of interventions		
	n	Mean (SD)	Median (IQR)	*n*	Mean (SD)	Median (IQR)	*n*	Mean (SD)	Median (IQR)
Item 1 Family income	550	3.28 (1.35)	3 (2)	549	3.25 (1.40)	3 (2)	520	3.23 (1.42)	3 (2)
Item 2 Residential building	549	3.34 (1.36)	3 (2)	549	3.32 (1.41)	3 (2)	521	3.30 (1.41)	3 (2)
Item 3 Safety precaution	547	3.74 (1.31)	4 (1)	549	3.75 (1.34)	4 (1)	519	3.62 (1.38)	4 (1)
Item 4 Water supply	550	3.37 (1.41)	4 (2)	549	3.31 (1.44)	3 (2)	520	3.31 (1.46)	3 (2)
Item 5 Household pets	550	3.47 (1.35)	4 (1)	547	3.49 (1.37)	4 (1)	520	3.40 (1.42)	4 (2)
Item 6 Marital satisfaction	549	3.66 (1.31)	4 (1)	547	3.69 (1.34)	4 (1)	520	3.62 (1.41)	4 (1)
Item 7 Family planning	549	4.30 (1.27)	4 (1)	548	4.27 (1.28)	4 (1)	520	4.15 (1.36)	4 (2)
Item 8 Adaptation to pregnancy	549	4.31 (1.24)	4 (1)	548	4.26 (1.27)	4 (1)	520	4.14 (1.34)	4 (2)
Item 9 Parental role	550	4.31 (1.25)	4 (1)	548	4.23 (1.25)	4 (1)	520	4.12 (1.37)	4 (2)
Item 10 Caregiver role	548	4.41 (1.23)	4 (1)	548	4.40 (1.24)	4 (1)	520	4.25 (1.32)	4 (1)
Item 11 Family process	549	3.89 (1.34)	4 (2)	548	3.86 (1.33)	4 (2)	520	3.76 (1.39)	4 (1)
Total score	543	3.83 (1.03)	4 (1)	543	3.79 (1.05)	4 (1)	506	3.72 (1.61)	4 (2)

Figure 1 illustrates the mean distribution of participants' self-perception of competence in family assessment and intervention at all stages of the nursing process: needs assessment, diagnosis, planning of interventions, implementation of interventions, and evaluation of interventions.

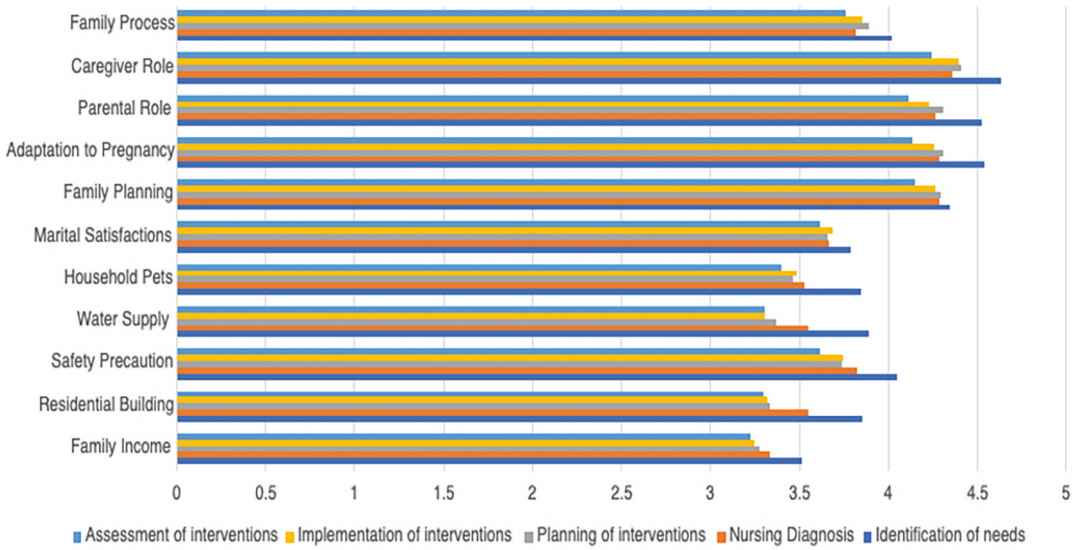

Figure 1. Distribution of mean scores for self-perceived competence in family assessment and intervention at each stage of the nursing process

The items that corresponded to the care areas family planning, adaptation to pregnancy, parental role, and caregiver role had the highest mean self-perception of competence scores; this trend persisted across the different stages of the nursing process.

At all stages of the nursing process, the caregiver role item had the highest mean self-perception of competence scores, higher than for any other items. This result expresses a self-perception of competence by the participants which exceeds the cutoff score of 4 (competent), on a continuum ranging from 1 (totally incompetent) to 7 (totally competent). Thus, we can conclude that, although the caregiver role item had the highest mean values of self-perceived competence, these scores were still low and far from the maximum possible value.

As shown in Tables 1 and 2 and Figure 1, the areas of care family income, residential building, safety precautions (except at the needs assessment stage), water supply, household pets, marital satisfaction and family process (except at the needs assessment stage) had the lowest mean scores, across all stages of the nursing process. We can also conclude that the participants perceived themselves as incompetent for some items, with mean scores ranging from 3.23 (family income item at the evaluation of interventions stage) to 3.89 (water supply item at the needs assessment stage), on a scale of 1 (totally incompetent) to 7 (totally competent).

Total scores for all stages of the nursing process

To gain a better understanding of the phenomenon of interest, total mean scores (the sum of all items that correspond to each of the MDAIF care areas) were calculated for each stage of the nursing process. This procedure showed that the average overall score of self-perceived competence decreases as the nursing process progresses (Table 1 and 2). At the needs assessment stage, average self-perception scores were 4.08, declining to 3.85 at the diagnostic formulation stage, 3.83 at the planning of interventions stage, 3.79 at implementation of interventions and, finally, 3.72 at evaluation of interventions.

Discussion

Descriptive analysis of the participating nurses' self-perception of competence showed that the highest mean item score at each stage of the nursing process was 4.64, in the care area "caregiver role" and at the needs assessment stage, which is clearly a low level. These results are in line with those of a previous study,[14] in which the highest mean score was 4.60, also in the same area of care and stage of the nursing process. At all stages of the nursing process, the care areas caregiver role, parental role, adaptation to pregnancy, and family planning showed average scores between 4.23 and 4.64. These results suggest that these are the areas in which nurses feel most experienced in the context of interacting with families.

The nurse's competence will influence responses related to fertility regulation and preparation for parenthood, as couples have the right to information, as well as access to effective contraceptive methods, promoting reproductive health.[15,16] Regarding adaptation to pregnancy, the nurse's competence will allow identification of the resources of family systems, establish action plans for the couple[17,18] and improve perception of self-efficacy, especially in unwanted pregnancies.[19] The parental role affects other domains of the family, especially when dysfunctional problems arise. This can reduce the time available for the couple, affect child development, decrease interactions with extended family members and affect the social life of all relatives.[20] The caregiver role had higher mean scores than any other area of care, with a minimum of 4.25 (at the evaluation of interventions stage) and a maximum of 4.64 (at the needs assessment stage). The support that nurses provide to the families and caregivers of a dependent patient explain the high competence scores obtained for the caregiver role item.[21]

The care areas in which the participants scored the lowest mean self-perceived competence values (i.e., in which they perceived themselves to be incompetent) were: family income, residential building, water supply, and household pets. Family income was the area of care in which participants felt they had the lowest level of competence. This topic can be seen as a source of discomfort, although the use of strategies to reduce inequalities in health outcomes and improve the security and financial stability of low-income families is within the scope of PHC nurses' practice.[22] The item "residential building", which provides shelter and protection to the family, includes, among others, aspects related to architectural barriers to health and household hygiene. The average score for this item ranged from 3.30 to 3.86. Assessment of architectural barriers allows the development of a plan to create security benefits. In addition, mastery of household hygiene, a domain related to environmental health indicators, promotes conditions conducive to the health of family members and, thus, prevents accidental crises due to the impacts of disease on family functioning.

From the point of view of developmental and functional processes, the care areas of marital satisfaction and family process had maximum scores of 3.79 to 4.02, respectively, placing these items at the low end of self-perceived competence.

Interventions with couples can help strengthen their relationship, preserving the health—including the sexual health—of both elements of the marital subsystem.[23,24] The overall mean self-perceived competence scores related to the family process item are consistent with the results obtained in previous research,[14] insofar as mean values for the nurses' self-perception of competence decreased over the course of the nursing process, culminating in the lowest mean scores at the evaluation of interventions stage. In previous studies that used the nursing process methodology in the hospital environment, the greatest challenge in implementing this methodology was also the stage of evaluating interventions.[25]

The nursing process is a dynamic and systematized methodology that encourages critical thinking. Use of this methodology will increase in-depth knowledge of the family, the formulation of nursing diagnoses, and the effectiveness of interventions. Despite the geographic limitation of this study, it provides new knowledge regarding nurses' self-perception of their competence in the context of family assessment and intervention, demonstrating both low average scores overall and low average item scores at each stage of the nursing process. This study was designed to provide new information by combining self-perception of competence with the care area domains of the MDAIF,[6] a model of family assessment and intervention at each stage of the nursing process.

Conclusions. The conclusions of this study refer to crucial aspects regarding nurses' perception of their own competence in family assessment and intervention. For all areas related to family assessment and intervention and at all stages of the nursing process, the participants endorsed a low level of self-perceived competence, even in those areas in which they rated themselves as competent—namely, parental role, adaptation to pregnancy, and family planning in the development dimension of the MDAIF and caregiver role in the functional dimension of the model. In the remaining care areas of the family assessment and intervention model—family income, residential building, safety precautions, water supply (structural dimension); marital satisfaction (development dimension); and family process (functional dimension)—nurses rated themselves as lacking competence. The steady decline in self-perceived competence in the areas related to family assessment and intervention over the course of the nursing process (needs assessment, diagnosis, planning of interventions, implementation of interventions, and evaluation of interventions) was also remarkable.

One limitation of this study was geographical, as the sample was drawn solely from the northern region of Portugal, which hinders generalization and external validation of our results and creates a need for replication research in other areas of the country.

It is important to train nurses in all MDAIF care areas within their practice settings, thus facilitating awareness of the skills needed to provide the best care to families. With regard to formal learning, institutes of nursing education must include objectives and content in their curricula that enable conceptualization of the family as an open system, with evolutionary and contextual dimensions that give it an unique identity that emerges from the reciprocity of mutual interactions between its members and the environment. The implications for practice of the development of competences based on a theoretical framework should demonstrate, in future research, changes in the self-perceived competence of nurses, as well as adequate responses to the health needs of families that are amenable to nursing care.

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Nursing Professionals within the Intergenerational Context during the 20th and 21st Centuries: an Integrative Review

Original article

Susana Rollan Oliveira[1]
https://orcid.org/0000-0002-1897-7835
José Siles González[2]
https://orcid.org/0000-0003-3046-639X

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Nursing Professionals within the Intergenerational Context during the 20th and 21st Centuries: an Integrative Review

Abstract

Objective. To describe the generational differences and similarities existing among nursing professionals of the 20th and 21st centuries and how these have influenced on the evolution of the profession. **Methods.** Integrative review according to the methodology by Whittemore and Knafl. The key words used for the search were: nurses, intergenerational relations, Veterans, Baby Boom, X generation, and Millennials. **Results.** The electronic search process yielded 10 documents (eight articles and two theses), all within the Anglo-Saxon environment (4 in Canada, 5 in the United States, and 1 in Australia). The documents recovered determined three principal themes: *the intergenerational nursing workforce* (n = 7), *recruiting and retention within an intergenerational workforce* (n = 2), and *tutoring within an intergenerational*

1 Nurse, PhD candidate. Universidad de Alicante, Spain. Email: rollansusana@hotmail.com
2 Nurse, PhD. Professor. Universidad de Alicante, Spain. Email: jose.siles@ua.es

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nursing workforce ($n = 1$). The four generations of nursing professionals (X, Y, Baby Boomers, and Veterans) have different aptitudes, social and cultural setting, that coexist within the same work staff. **Conclusion.** This study establishes the legitimacy of the intergenerational differences as an important variable of social categorization. The findings have the potential to improve generational comprehension and promote a more cohesive culture in clinical practice settings, besides conserving the legacy of the four generations of nursing professionals contributing to outline the identity of the nurses through the conservation of social, cultural, and professional experiences.

Descriptors: veterans; intergeneration interval; nurses; delivery of health care.

Los profesionales de enfermería en el contexto intergeneracional durante los siglos XX y XXI: una revisión integradora

Resumen

Objetivo. Describir las diferencias y similitudes generacionales existentes entre los profesionales de enfermería del siglo XX y XXI y cómo han influido en la evolución de la profesión. **Métodos.** Revisión integradora según la metodología de Whittemore y Knafl. Las palabras clave utilizadas para la búsqueda fueron: enfermeras, relaciones intergeneracionales, Veteranos, Baby Boom, generación X y Millennials. **Resultados.** El proceso de búsqueda electrónica dio como resultado un total de 10 documentos (8 artículos y dos tesis), todos ellos en el ámbito anglosajón (4 en Canadá, 5 en Estados Unidos y 1 en Australia). En los documentos recuperados se determinaron tres temas principales: *la fuerza de trabajo de enfermería intergeneracional* ($n = 7$), *el reclutamiento y la retención dentro de una fuerza de trabajo intergeneracional* ($n = 2$) y *la tutoría dentro de una fuerza laboral de enfermería intergeneracional* ($n = 1$). Las cuatro generaciones de profesionales de enfermería (X, Y, Baby Boomers y Veteranos) tienen diferentes aptitudes, entorno social y cultural, que conviven dentro de un mismo equipo de trabajo. **Conclusión.** Este estudio establece la legitimidad de las diferencias intergeneracionales como una importante variable de categorización social. Los hallazgos tienen el potencial de mejorar la comprensión generacional y fomentar una cultura más cohesiva en entornos de práctica clínica, además de

conservar el legado de las cuatro generaciones de profesionales de enfermería lo que contribuye a perfilar las señas de identidad de las enfermeras mediante la conservación de experiencias sociales, culturales y profesionales.

Descriptores: veteranos; brecha generacional; enfermeras y enfermeros; atención a la salud.

Profissionais de enfermagem no contexto intergeracional durante os séculos XX e XXI: uma revisão integrativa

Resumo

Objetivo. Descreva as diferenças e semelhanças geracionais entre os profissionais de enfermagem dos séculos XX e XXI e como elas influenciaram a evolução da profissão. **Métodos.** Revisão integrativa segundo a metodologia Whittemore e Knafl. As palavras-chave utilizadas para a busca foram: Enfermeiros, relações intergeracionais, Veteranos, Baby Boom, Geração X e Millennials. **Resultados.** O processo de busca eletrônica resultou em um total de 10 documentos (8 artigos e duas teses), todos da área anglo-saxônica (4 no Canadá, 5 nos Estados Unidos e 1 na Austrália). Três temas principais foram identificados nos documentos recuperados: *a força de trabalho de enfermagem intergeracional (n = 7), recrutamento e retenção dentro de uma força de trabalho intergeracional (n = 2) e tutoria dentro de uma força de trabalho de enfermagem intergeracional (n = 1)*. As quatro gerações de profissionais de enfermagem (X, Y, Baby Boomers e Veteranos) possuem diferentes aptidões, meio social e cultural, que convivem dentro de uma mesma equipe de trabalho. **Conclusão.** Este estudo estabelece a legitimidade das diferenças intergeracionais como uma importante variável de categorização social. Os resultados têm potencial para melhorar a compreensão geracional e fomentar uma cultura mais coesa no cenário da prática clínica, além de preservar o legado das quatro gerações de profissionais de enfermagem, ajudando a moldar a identidade do enfermeiro por meio da preservação de experiências sociais, culturais e profissional.

Descritores: veteranos; intervalo entre gerações; enfermeiras e enfermeiros; atenção à saúde.

Introduction

This study focuses on the 20th and 21st centuries, given that it is the temporary space where more changes were experienced in the restructuring and organizing of nursing as profession. The last century, due to its proximity, facilitates access to the legacy that can be transmitted by professionals who, in spite of the time transpired, can contribute with their knowledge, perceptions, attitudes, and experiences in different health settings. It is necessary to consider that the different generations of nursing professionals (X generation, Y generation, Baby Boomers, and Veterans) can coexist within the same health staff.[1] Each generation is subject to the development processes of the course of human life; each experiences a unique historical context that shapes the development of said course of life. The diversity of characteristics, like age, gender, socioeconomic level or even ethnicity can cause differences not only within the very work staff but within a generation with respect to the following. Understanding and accepting these differences can contribute to diminishing generational conflict.[2,3] Due to this, it is fundamental to know the generational diversity[4] and address the specific needs of each of the generations.[5] The different perspectives provided by multiple generations may be used advantageously to enhance efficiency[6] and the results of the health staff and promote the resolution of generational conflicts to construct effective work teams.[7,8] Likewise, an environment in which nurses are respected for their differences[9] is key to generate commitment and promote satisfaction in the workplace. This is why, by fostering relationships, effective communication,[10,11] commitment,[12,13] and compensation[14] among nursing professionals from distinct generations, a cohesive team will be set up that reflects the shared values of all team members.

Through the bibliography search for articles that address generational themes, we set the purpose of appraising and describing knowledge of the generational differences or similarities existing among nursing professionals from the 20th and 21st centuries and how these have influenced on the evolution of the profession. These generational differences,[15] within the corresponding social and historical context, are not only known, but are at the service of common goals, thus, become a resource for learning and change. This is the paradigm that gives added value, converting the difference into advantage. In short, it is the paradigm that will be adopted to carry out this work and its justification.

The term generation[16] is used to identify the set of people, within similar age groups, born during the same moment of history and culture.[17] Although there is no absolute beginning or end among the different generations, overall, these encompass 15 - 20 years. The years included in each generation vary among researchers, particularly for those years on the cusp of a generation.[18] A thin line exists between segmenting and stereotyping generations, which is why stereotyping should not be done [19-21] of the nursing professionals for belonging

to a given generation. It must be considered each nursing professionals have their personality and experiences and individual characteristics of life also combine to create unique beings.[22]

The term generational cohort [23] refers to people born during the same overall time lapse who share key vital experiences, including historical events, public heroes, entertainment, hobbies, and early work experiences. It is theorized that these common life experiences create cohesion in perspectives and attitudes. Although knowledge and skills increase as people age, the basic characteristics, including values and behavioral norms established during their formative years persist. As a result, generational cohorts develop values and distinct workforce patterns.

The 20th and 21st centuries include the GI generation,[24] the Veteran generation, the Baby Boom generation, the X generation, the Y generation, the Z generation (they have not yet joined the health teams) and talk has begun about the Alpha generation, 100% digital.[25] This study focuses exclusively on four generations that coincided in the workplace: [26] the Veteran generation, the Baby Boom generation, the X generation, and the Y generation. The following is a brief description of these generations.

The *generation of Veterans* (also called traditionalists, the Silent or War generation) comprises the nursing professionals born between 1925 and 1945. The Veteran generation has contributed importantly not only to the social, political, and economic transformation in Spain and the rest of the world, but it has been a bulwark within the nursing profession; laying the foundations of the nursing profession as we know it currently. Many of these professionals are already retired. During this period, dramatic events have taken place in the world, like the Great Depression, the Second World War, along with the Civil War in Spain, which led this generation to great sacrifice, like struggling and dying at the service of their respective countries. In turn, this impacted on the way these people saw the world of work. They believe in employment for life and in hierarchies. They also value professional respect, the professional image of nursing, loyalty, and dedication.[27] Veterans have worked hard and believe that hard work will produce rewards. [28] Changes make them uncomfortable and they tend to favor command, direction control and leadership styles.[29,30] Their principals values are law and order, respect for authority, duty, honor, devotion, and sacrifice.

The Baby Boomer generation encompasses those born between 1946 – 1964; it was called Baby Boom due to due to the increased birth rate observed during this period, they currently constitute two thirds of all nursing professionals. The Baby Boomer generation is the biggest group among nursing professionals. An important number of nurses from the Baby Boomer generation retired in 2010.[7] They are known for their strong work ethic. They enjoy direct traditional communication, like face-to-face meetings, but have also adapted to les personal modern communication methods that use technology.[31,32] Overall, grew up in a two-parent home with a mother at home, a father who was an authority figure[33] and prefer teamwork.[19] Baby Boomers want the world to know they have achieved something,[34,35] equating work with self-esteem;[36] consequently, they can be motivated by public recognition and work advantages. They are pictured as addicted to work and live to work.[37]

The X generation, born between 1965 and 1980, as they mature, are quickly becoming one of the pillars of the organizations; their strength is ideal to solve problems of the clinical practice or issues related with the guarantee of quality. The X generation is significantly smaller than that of the Baby Boomers. They have been described as the latchkey children of parents with two careers. They are not too loyal to leaders[38] and institutions, seeing education as a necessary tool to survive in a competitive world. They are slow to commit and value both their personal and professional lives. They show more indicators of burnout[39,40] and are less inclined to participate in the exchange of knowledge.[41]

The Millennials generation, also known as the Y generation, the Net generation, or next generation is composed of nursing professionals born between 1981 and 2000; members of the Y generation and children of the Baby Boomers. By absolute numbers, this generation alone far exceeds the Baby Boom generation, driven in part by an increase in the immigrant population. The Y generation has grown in a multicultural and multiethnic world. Communication through technology is the cornerstone of this generation with mobile phones, text messages, and e-mail. They are experts in technology.[42] An expanding economy encouraged values, like optimism, trust, honesty, accomplishments,[43] career advancement,[44] la sociability and morality. They are self-sufficient[29] and value teamwork,[45,46] as well as tutoring[47-51] and feedback. Just like the Veterans, nursing professionals belonging to the Y generation expect rewards for hard work. The Millennials have an altruistic desire to help,[52] value the balance between work and life,[53] want to make decisions on their work schedules.[54] One of the most interesting characteristics of the Millennials is their expectation of having the capacity to contribute to decisions in their workplace, provoked by their active role in family decisions.[55]

Methods

The search was conducted in the following databases: CINAHL, PubMed, ProQuest, EbscoHost, Science direct, Scopus, Web of Science, Wiley on-line library, Ovid. In addition, the search was extended to secondary references and to the manual search of journals. The keywords used for the search were: nurses, intergenerational relations, Veterans, Baby Boom, X generation, Millennials.

The selection criteria were descriptive, quantitative, or qualitative studies, and mixed-method studies, which describe the knowledge, perceptions, attitudes, and experiences of the four generations of nursing professionals in different health settings, including students and which additionally contain studies by nursing professionals from the point of view of the four generation cohorts (X generation, Y generation, Baby Boomers, and Veterans). The work included gray literature due to its important source of information that can be corroborated by experts on the field, besides being able to report on useful scientific findings that can reduce publication bias. Other inclusion criteria were peer-reviewed studies, without date-of-publication limit and in English.

The work excluded articles missing any of the four generations of nursing professionals, studies that did address the perspective of any of the four generations or studies whose samples were not constituted by nursing professionals, including students. It also excluded articles that did not describe in detail the knowledge and attitudes of the health professionals in relation with the four generations or that addressed other themes not defined in this study. The study also excluded presentation formats, like books, text chapters, editorials, and comments or reviews.

To evaluate the quality of the studies included (quantitative and qualitative), a quality verification list was used.[56] This verification list comprises nine questions, each of which has four subcategories. A total score is calculated of methodological quality, which varies from 9 (quite poor) to 36 (good) and quantitative and qualitative studies can be analyzed, including gray literature. The quality score of the studies included ranges between 33 and 36.

Four research questions were used: what is the current state of the literature with respect to the intergenerational nursing workforce and its influence on the evolution of this profession, what is the current state of the literature with respect to recruiting, retention and tutoring of nurses within an intergenerational workforce and their influence

on the evolution of this profession, what is the potential for future research with respect to the nursing profession and its intergenerational work environment, do intergenerational studies exist on nursing professionals in Spain? The updated integrative review methodology described by Whittemore and Knafl[57] was used as guide for this review. An integrative review is a specific review method that summarizes past empirical or theoretical literature to provide more complete comprehension of a theme or phenomenon besides playing an important role in the evidence-based practice for nursing.[58]

Results

The electronic search process yielded eight articles and two thesis works. Figure 1 summarizes the heuristic and selection process.

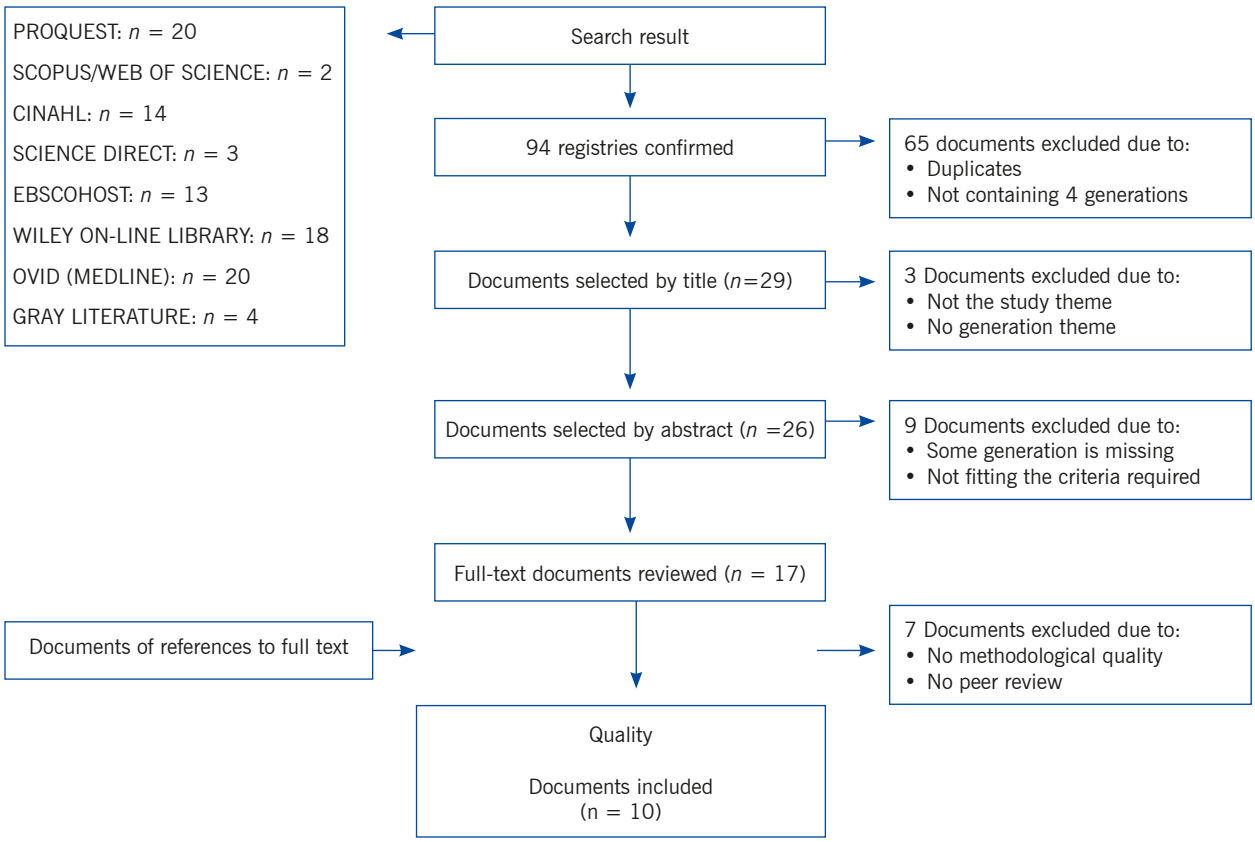

Figure 1. Heuristic and document selection process

The work included 10 articles,[9,12,13,18,27,29,30,44,49,53] two from gray literature.[9,53] The articles included in this study all belong to the Anglo-Saxon setting**:** four from Canada,[18,30,44,49] one from Australia[29] and five from the United States.[9,12,13,27,53] No study was found in the Spanish context containing the four generations of nursing professionals. Three themes were determined: *intergenerational nursing workforce* with seven articles;[9,12,13,18,27,29,30] *recruiting and retaining within an intergenerational workforce* with two articles;[44,53] *tutoring within an intergenerational nursing workforce* with one article.[49] Table 1 summarizes the research studies.

Table 1. Summary of research studies

Theme 1. The intergenerational nursing workforce
Blythe *et al.*, Canada; 2008[18] *Objective:* to perform an exploratory analysis to determine if nurses of different ages had different attitudes toward their work. *Design:* mixed methodology study. *Data collection method: surveys* and focal groups. *Sample: n* = 1,396. 96.2% were women. *Quality score:* 33
Crowther and Kemp. Australia; 2009[29] *Objective:* to determine how attitudes of nurses from rural mental health differ over generations. *Design:* descriptive study. *Data collection method:* surveys by year of birth. *Sample: n* = 89.4 were Veterans, 52 Baby Boomers, 17 X generation, and 5 Y generation. *Quality score:* 36
Hisel. USA; 2020[27] *Objective:* to examine the level of job commitment among Veteran, Baby Boom, X Generation, and Millennial nurses. *Design:* quantitative causal comparative design. *Data collection method:* surveys through a social network platform to measure their level of job commitment. *Sample: n* = 1,885. 92% were women. *Quality score: 36*
Hu *et al*., USA; 2004[12] *Objective:* to help management nurses to maximize departmental effectiveness by capitalizing the unique characteristics of the multigenerational nursing staff. *Design:* descriptive design. *Data collection method:* surveys. *Sample: n* = 62; 90,3% were women. *Quality score: 35*
MacDonnell and Buck- Fadyen. Canada; 2017[30] *Objective:* to explore the critical influences that determine the meanings, practices, and impacts of nursing activism. *Design:* qualitative exploratory study, comparative study of life story that uses a feminist lens. *Data collection method:* interviews and focal groups. *Sample: n* = 40. X generation = 8, Y generation = 9, Baby Boomers = 20, and Veterans = 3. 87.5% were women. *Quality score:* 33
Sullivan *et al.*, USA; 2013[13] *Objective:* to describe the job commitment of nursing professionals, identify generational predictors, present the implications for nursing managers, and suggest future research. *Design:* descriptive study. *Data collection method:* non-experimental surveys. *Sample: n* = 747 *Quality score:* 36

Table 1. Summary of research studies (Cont)

Theme 1. The intergenerational nursing workforce
Welcher. USA; 2011[9] *Objective:* to explore generational conflicts related with four generations working together and the values, beliefs and attitudes of each generation in local hospitals in Georgia. *Design:* qualitative phenomenological study using the Van Kaam method modified by Moustakas (1994) *Data collection method:* interviews. *Sample: n* = 20 *Quality score:* 35
Theme 2. Recruiting and retaining an intergenerational workforce
Steinkuehler. USA; 2009[53] *Objective:* to review related literature and conduct an exploratory research on the organizational attraction of multigenerational nursing cohorts in the health industry. *Design:* Descriptive correlation study. *Data collection method:* surveys. Questionnaires that focus on a computer-generated random stratified sample of nurses. *Sample: n* = 1100. 250 veterans, 250 Baby Boomers, 300 X generation, and 300 Y generation participants. *Quality score:* 35 **Tourangeau *et al.*, Canada; 2015**[44] *Objective:* to describe the characteristics of the work of nursing professors and determine if generational differences exist. *Design:* descriptive study. *Data collection method:* Phase I used focal groups. Phase II developed and used a survey. *Sample: n* = 650 *Quality score:* 34
Theme 3. Tutoring within an intergenerational nursing workforce
Earle *et al*., Canada; 2011[49] *Objective:* to discuss an integrative review of the literature. *Design:* mixed-method study. *Data collection method:* integrative review methodology de Whittemore and Knafl (2005). *Sample: n* = 13,188. 18 articles *Quality score:* 33

Discussion

Theme 1. The intergenerational nursing workforce

Older nurses, according to Blythe *et al*.,[39] were more committed with the workplace, had higher job satisfaction, and were less emotionally exhausted than the younger nurses. Hisel[27] also coincides on Veteran nurses as the generation most committed, followed by Baby Boom nurses, the X generation, and Millennials. Studies by Welcher[9] confirmed that the level of commitment emerged as the principal difference with respect to job habits and attitudes among the older nurses (Veteran generation and Baby Boom generation) and nurses from younger generations (X generation and Y generation). Nurses belonging to the Veteran and Baby Boomer generations tended to be more committed with work compared with the younger generations of nurses. However, authors, like Sullivan *et al.*,[13] also coincide in that Veterans were the generation most committed with work and in their study found that the X generation was the least committed. In addition, they conclude that the fact that the health staff is comprised of highly committed nurses contributes to providing quality care. Nevertheless, with the retirement of Veteran nurses and the upcoming retirement of the Baby Boom nurses, nurses from the X generation and the Millennials will become the dominant

workforce in health care. Current medical care organizations must be prepared for this change toward a less committed nursing workforce.[27] In the study by Hu *et al.*,[12] almost half the Veterans and Baby Boomers consider computers as terrifying and complicated. The level of commitment and technology competence [9] were the principal differences in work habits between nurses from older and younger generations.

Veterans and Baby Boomers consider work and social life as one;[29] in addition, they value maintaining a single employer throughout their lives. While the Baby Boomers[9] accept long work shifts and take on overtime hours, the X generation values balance between work and family, so they work out of necessity. Regarding social activism,[30] the X and Y generations focused on social health determinants and social injustice for population groups; the Baby Boomers and Veterans identify activism as a central practice and a professional problem.

Theme 2. Recruiting and retaining nurses within an intergenerational workforce

Within an intergenerational workforce, the X and Y generations[53] consider economic performance as more important than for the Veteran and Baby Boomer generations. Other studies[44] found that the Veteran generation selected health problems as a disincentive to stay employed. It must be kept in mind that at the time of the study the members in the Veteran generation were 66 years of age or older, which may explain the high rate of selection by this generation of this disincentive. To retain this older generation of nursing professors in academic settings, modifications could be made in their work to help them to comply effectively with their academic roles.

Theme 3. Tutoring of nurses within an intergenerational workforce

Studies exist that highlight the importance[49] of tutoring within the work context in relation with recruiting and retaining nurses, considering tutoring the key support that younger nurses need to perform leadership roles. This study[49] also manifests that there is currently a disconnect between the educational values of students and the teaching staff, which increases awareness of the need to examine further these intergenerational differences. In short, taking advantage of the contribution of the skill set of each individual cohort and each generation of nursing professionals, more cohesive work teams can be formed.[28] By mutually supporting the distinct generations of nurses their contribution to patient care is maximized.[35]

Limitations of the bibliography review include selection of sources, and lack of visibility of publications that are not indexed in databases. To avoid publication bias, gray literature was used. Note that representation has not been found of studies conducted in Europe and even in Spain that include the four generations of nursing professionals studied. It must be kept in mind that the sociopolitical circumstances of each country are different and the social and cultural development of the late 20th century has not been simultaneous in every region of the planet. This may be a line of study for future research. Only one study exists from the gender perspective. Due to the lack of reference regarding the gender of participants in the studies or samples that do not turn out statistically significant in terms of the generational cohorts, it is not possible to analyze the study from the gender perspective.

Conclusion. Since the late 20th century and early 21st century care quality has been deteriorating as a consequence of the shortage[59] of nursing professionals globally. The shortage of nurses is the product of the combination of an aging workforce, high rotation of nursing staff and the lack of capacity to attract and retain these professionals. Hence, those responsible for health services must know how to promote work commitment in young generations, bearing in mind that different authors have concluded that the X generation and Millennials are the least committed, given that

Veteran and Baby Boom nurses have retired or are close to retiring. Only international studies exist that include the four generations of nursing professionals (X, Y, Baby Boomers; Veterans) in the Anglo-Saxon setting, finding none in the Spanish context, which may be proposed for future research. Similarly, future research may be proposed on intergenerational studies from the gender perspective. The findings have the potential to improve generational comprehension and foster a more-cohesive culture in clinical practice settings, besides conserving the legacy of the four generations of nursing professionals, contributing to outline the identity of the nurses through the conservation of social, cultural, and professional experiences.

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Original article

Measurement of Practices-Knowledge-Attitudes of the Nursing Process: Systematic Review

Fabio Alberto Camargo-Figuera[1,7]
https://orcid.org/0000-0001-6070-9327

María Alejandra Ortega-Barco[2,7]
https://orcid.org/0000-0002-6851-066X

María Camila Rojas-Plata[3,7]
https://orcid.org/0000-0002-6475-2098

Daniela Marín-Rodríguez[4,7]
https://orcid.org/0000-0001-5970-7498

Lizeth Johana Alarcón-Meléndez[5,7]
https://orcid.org/0000-0002-9462-5620

Beatriz Villamizar-Carvajal[6,7]
https://orcid.org/0000-0002-9430-7649

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Measurement of Practices-Knowledge-Attitudes of the Nursing Process: Systematic Review

Abstract

Objective. To analyze the literature available on the psychometric properties of the instruments to measure knowledge, attitudes, and practices of the nursing care process. **Methods.** This was a narrative-type review conducted by following the recommendations of the PRISMA declaration. The search strategy was executed in two stages; through the search in databases by two reviewers and – thereafter – three reviewers identified independently the studies and evaluated the methodological quality of the measurement instruments by using the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN) property checklist boxes. **Results.** Of 71 studies identified for the full-text review, only seven complied with the inclusion criteria that represent four instruments (Q-DIO, D-CATCH, NP-CDSS, PNP). It was found that the instruments continue in their validation and

1 Nurse, PhD. Professor. Email: falcamfi@uis.edu.co
2 Nurse, Master's. Professor. Email: maorteba@correo.uis.edu.co
3 Nursing student, COLCIENCIAS Young Researcher. Email: camilarojas9904@gmail.com
4 Nurse, COLCIENCIAS Young Researcher. Email: danymarinr@gmail.com. Corresponding author.
5 Nurse, Specialist. Email: lizalarcon33@gmail.com
6 Nurse, PhD. Professor. Email: beatriz@uis.edu.co
7 Universidad Industrial de Santander, Colombia

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appropriation processes to reality in health services. **Conclusion.** In spite of the evident evolution of the instruments to evaluate the implementation of the nursing care process, the need is still valid for an instrument that measures aspects of knowledge, attitudes, and practices in every stage of the process.

Descriptors: nursing process; standardized nursing terminology; nursing methodology research; health knowledge; attitudes; practice.

Medición de prácticas-conocimientos-actitudes del proceso de enfermería: Revisión sistemática

Resumen

Objetivo. Analizar la literatura disponible sobre las propiedades psicométricas de los instrumentos para medir Conocimientos, Actitudes y Prácticas del Proceso de Cuidado de Enfermería. **Métodos.** Revisión de tipo narrativa según las recomendaciones de la declaración PRISMA. La estrategia de búsqueda se realizó en dos etapas; a partir de la búsqueda en bases de datos por parte de 2 revisores y, posteriormente, tres revisores identificaron de forma independiente los estudios y evaluaron la calidad metodológica de los instrumentos de medición utilizando la COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN). **Resultados.** De 71 estudios identificados para la revisión de texto completo, solo 7 cumplieron los criterios de inclusión que representan 4 instrumentos diferentes (Q-DIO, D-CATCH, NP-CDSS, PPE). Se encontró que los instrumentos continúan en procesos de validación y apropiación de los mismos a la realidad en los servicios de salud. **Conclusión.** A pesar de la evidente evolución de los instrumentos para evaluar la implementación del Proceso de Cuidado de Enfermería, aún sigue vigente la necesidad de un instrumento que mida los aspectos de Conocimientos, Actitudes y Prácticas en todas las etapas del proceso.

Descriptores: proceso de enfermería; terminología normalizada de enfermería; investigación metodológica en enfermería; conocimientos; actitudes y práctica en salud.

Medição das práticas, conhecimentos e atitudes do processo de enfermagem: revisão sistemática

Resumo

Objetivo. Analisar a literatura disponível sobre as propriedades psicométricas dos instrumentos de medida de Conhecimentos, Atitudes e Práticas do Processo de Cuidar de Enfermagem. **Métodos.** Revisão narrativa realizada de acordo com as recomendações da declaração PRISMA. A estratégia de busca foi realizada em duas etapas; por meio da busca nas bases de dados CINAHL, MEDLINE, BVS e Google Scholar por 2 revisores e, posteriormente, três revisores identificaram os estudos de forma independente e avaliaram a qualidade metodológica dos instrumentos de medição usando a COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN). **Resultados.** Dos 71 estudos identificados para revisão de texto completo, apenas 7 preencheram os critérios de inclusão representando 4 instrumentos diferentes (Q-DIO, D-CATCH, NP-CDSS, PPE). Constatou-se que os instrumentos continuam em processos de validação e apropriação dos mesmos à realidade nos serviços de saúde. **Conclusão.** Apesar da evidente evolução dos instrumentos de avaliação da implementação do Processo de Cuidar em Enfermagem, persiste a necessidade de um instrumento que mensure os aspectos de Conhecimento, Atitudes e Práticas em todas as etapas do processo

Descritores: processo de enfermagem; terminologia padronizada em enfermagem; pesquisa metodológica em enfermagem; conhecimentos; atitudes e prática em saúde.

Introduction

The nursing staff is the principal provider of patient care, responsible for continually identifying health problems and implement and adjust their interventions and that of other health professionals;[1] for this, it has its own tool, which requires technical-scientific knowledge that systematize care,[2] known as the nursing care process (NCP). Its registry in the clinical chart permits nurses to show the impact generated by their interventions, which demonstrates the importance of their professional role, as well as their autonomy and contribution within the health staff.[3]

Nursing records are considered a quality indicator in patient care, thereby, tools are required to evaluate the information registered by the nursing professionals, thus, implementation of the NNN (North American Nursing Diagnosis Association - NANDA-I, Nursing Interventions Classification – NIC, and Nursing Outcomes Classification - NOC) standardized language has permitted significantly to organize the documentation of nursing work, making the adequate registry of diagnoses improve the documentation of the evaluation, quality of the interventions, and results obtained.[4]

Evidence shows that different factors[5-7] exist associated with the NCP application, which correspond to knowledge,[8] attitudes, and practices.[9-12] Knowledge[13] promotes the capacity of professional to remain open to using sources of information, making these significant and useful for the professional practice. Attitudes play an important role in implementing conducts; they permit explaining how a subject exposed to a stimulus adopts a given practice and not another, hence, the attitude toward the nursing care process is a primordial factor in its use.[14] Lastly, the practices or behaviors are observable actions by an individual in response to a stimulus; that is, these are the concrete aspect, the action.[15]

Due to the foregoing, different strategies have been undertaken to evaluate skills in applying the NCP, given that it would be related with the effectiveness of its interventions;[16] instruments exist that evaluate one or two or more parts, until evaluating all its components.[17]

Evolution in the development of the evaluation of the NCP quality has been carried out bearing in mind criteria included in the first instruments proposed by Ziegler in 1984 (Ziegler Criteria for Evaluating the Quality of the Nursing Process - ZCEQNP) and by Nordstrom and Gardulf in 1996 (NoGA), which centered on the structure of the documentation of the nursing process. Later, the importance was discovered of measuring the attitudes of nurses, creating the *Positions on Nursing Diagnosis* (PND) in 1992, developed by Lunney and Krenz.[18] Björvell, Thorell-Ekstrand & Wredling (2000), which identified the need to evaluate not only the existence of data, but also their qualitative aspects.

Thus, they proposed Cat-ch-ing, responding to the new characteristics of the nursing exercise, at the time being a more-independent practice in which the documentation of care had to include not only the timely and precise registry of the medical and nursing interventions performed, but also the decision process, explaining and evaluating the nursing actions.[19] In 2007, Müller-Staub M et al., evidencing in their systematic reviews that no instrument existed to measure the NNN, and based on a modified drafting of the ZCEQNP and on the seven-point scale by Lunney, they created the Q-DIO.[20]

From these instruments to evaluate the NCP, it is important to know the type of psychometric properties evaluated and the methodological strategies used for their validation, from the simplest validity to evaluate, the apparent validity, to the most complex, validation of criterion and sensitivity to change. Different methods exist for such as of two large paradigms,[21] the classical theory of the test and the response theory to the item; the latter with some advantages over the other;[22] among those advantages, estimation is highlighted of statistics for the items and for the individuals, establishing the difficulty of the items and the ability of the individuals. Another advantage, in theory, is the invariability of the instrument's parameters when calculated in groups of different abilities, making the independent estimations of the sample used comparable.

Moreover, in NCP implementation in the practice, instruments to measure its quality have been modified – responding to the challenges represented by each progress in the nursing records. This is how today, in the search of the use of electronic records throughout the world, initiatives of tools emerge that bear in mind the nurses' practices, knowledge, and attitudes.

The aforementioned evidences that existing instruments to evaluate knowledge, attitudes, and practices (KAP) of the NCP report variability in their use over time, as well as in their validation process. Bearing in mind that validation of the instruments (face, content, construct, criterion, internal consistency, reproducibility, and sensitivity), permits establishing their reliability and reproducibility, whether for measurements at a given moment or for comparisons before and after applying interventions to determine their effectiveness or efficacy. In the health area,[23] the importance is highlighted of carrying out these processes and, finally, obtaining validated instruments to measure phenomena, given that often these are subjective phenomena.

Considering that a narrative review permits the objective evaluation of the characteristics of the instruments and, thus, identifies the most adequate for their use, the objective of this study was to describe the state-of-the-art of the instruments to measure KAP of the NCP and their psychometric properties.

Methods

This narrative-type review was carried out by following the recommendations by the PRISMA declaration,[24] which has 27 items and a four-step flow diagram adapted to the literature search methodology and the selection of primary studies to be included in the synthesis of the evidence.

The search strategy was conducted in two stages; the first part started through the search by two reviewers in the CINAHL, MEDLINE, and BVS databases and in Google Scholar, guided under the question "Which instruments exist in the literature to measure knowledge, attitudes and practices related with the nursing process or the NNN standardized languages?, formulated from the P: patient or problem, I: intervention, C: compared with, O: Outcomes –results (PICO) question; using synonyms and MeSH term, thus: **P**: Nurse OR Registered Nurses OR Nursing; **I:** Surveys and Questionnaires AND Knowledge, Attitudes, Practice OR Attitude OR Practice OR Knowledge (MeSH) AND Nursing Records (MeSH); **C**: Does

not apply; **O**: Nursing process (MeSH) OR Nursing diagnosis (MeSH) OR NANDA AND NIC AND NOC OR Nursing interventions OR Nursing outcomes OR Standardized Nursing Terminology (MeSH) OR Standardized nursing languages OR Standardized Nursing Data OR Nursing Diagnosis/standards OR Nursing Records/standards.

For this search, the limits were publications from 2010 to 2020, in English, Spanish, or Portuguese on studies conducted in humans.

The following shows an example of the search strategy in PubMed: *(((((Nurse) OR Nursing) OR Registered Nurses)) AND (((((((Surveys and Questionnaires)) AND Knowledge, Attitudes, Practice) OR Attitude) OR Practice) OR Knowledge) AND Nursing Records [MeSH Terms])) AND ((((((((((Nursing process [MeSH Terms]) OR Nursing diagnosis [MeSH Terms]) OR NANDA) AND NOC) AND NIC) OR Nursing interventions) OR Nursing outcomes) OR Standardized Nursing Terminology [MeSH Terms]) OR Standardized nursing languages) OR Standardized Nursing Data) OR Nursing Diagnosis/standards) OR Nursing Records/standards)*

Upon ending this first stage, 16 instruments were identified, responding to the research question posed; this input gave continuity to the second stage that included a third reviewer. Each reviewer conducted an independent search, using the 16 names as search terms in the CINAHL, MEDLINE, and BVS databases and in the Google Scholar search engine. When necessary, the instrument's authors were contacted to find articles that described clearly the evaluation of the psychometric properties of each instrument. This second stage was performed from March to May 2020, following the same limits already described.

Inclusion criteria. Studies were selected that conducted evaluation of psychometric properties to measurement instruments for: knowledge, attitudes, or practices related with the nursing process.

Exclusion criteria. The work excluded articles that did not completely describe the validation process, as well as those about instruments to which there was no access. It also excluded conference abstracts and case reports

Article selection. Selection of the documents was based on the agreement between the research question and the title/abstract, recovering the full texts to re-evaluate them according with the inclusion criteria; this process was carried out independently and in standardized manner by three reviewers. Each reviewer, after reading the full text for each article, filled out a sheet with the following items: name of the article, year, authors, complete description of the validation process, name of the instrument, and dimension it evaluates (knowledge, attitudes, or practices).

Thereafter, bearing in mind the name of each instrument, the search was conducted for it to identify author, creation data, name, language, number of items, form of scoring. From this sheet, consensus was reached among the reviewers to establish the articles to analyze. Said consensus was reached simultaneously through virtual meetings to carry out the discussion and analysis of each article

Data extraction. The study followed the recommendations of the COSMIN [25] tool's manual for risk of bias. This table was filled out in Excel by a researcher and verified by another researcher. Data were extracted on the design, purpose, population, measurement instrument, properties of the instrument, author, year of publication, statistical tests, and statistical results of each study.

Evaluation of the quality of the articles. The methodological quality of the studies included was assessed through adjusting the COSMIN risk-of-bias control list,[26] constructing an Excel spreadsheet for each article, each including 116 items, divided into the following sections: instrument development, content validity, structural validity, internal consistency, transcultural validity,

reliability, measurement error, validity of criterion, hypothesis validity and response capacity tests. Each item was written in question form with the following response options: very well, adequate, doubtful, inadequate, or does not apply.

To respond to each item, virtual meetings were conducted with the presence of three reviewers, who verified each question in the full text, and in consensus the item evaluated was scored; when the question required it, the necessary literature search was carried out to respond to the item.

The final score of the methodological quality of each article was assigned bearing in mind the indication provided by the tool, that is, the article's overall score corresponded to the lowest score found in any item.

In the search aimed at this review, the sample of interest was defined as the nurses' records or the nurses who had completed an instrument (independent variable) to measure the practice, knowledge, or attitudes of applying the nursing process (the result or the dependent variable).

Psychometric properties. Upon defining the articles de mayor relevance that complied with the selection criteria and according with the COSMIN guide,[26] the study described the data related with internal consistency, reproducibility, face validity, content validity, construct validity, criterion validity, reproducibility, and sensitivity to change evaluated by each study. This narrative review was carried out within the frame of the research project "Effect of a formation program to implement the nursing process in a tier III health care institution" funded by the Vice-rectory of Research and Extension, Code No.2450 from Universidad Industrial de Santander and which was approved by the ethics committee in the Faculty of Health at Universidad Industrial de Santander.

Results

In the search of the CINAHL, MEDLINE, and BVS databases and search in other sources (through bibliography references and Google Scholar) 11,288 articles were found. After adjusting the duplicates, 6,308 articles remained; of these, 2,297 were eliminated by applying search limits (publications from 2010 to 2020, in English, Spanish, or Portuguese). Thereafter, the second stage of the search was begun by name of instrument, which identified 150 articles and which were added to the main search.

Consecutively, with 4,161 articles, their review was started through title/abstract from which 4,090 articles were discarded due to not coinciding with the search objective and not having full text. A critical reading was performed of the 71 articles remaining, with application of the inclusion criteria and eliminating 16 because of no access to the instrument evaluated, 18 because they did not describe the complete evaluation process, 25 for not evaluating the complete nursing process and, finally, seven articles were selected for review (Figure 1).

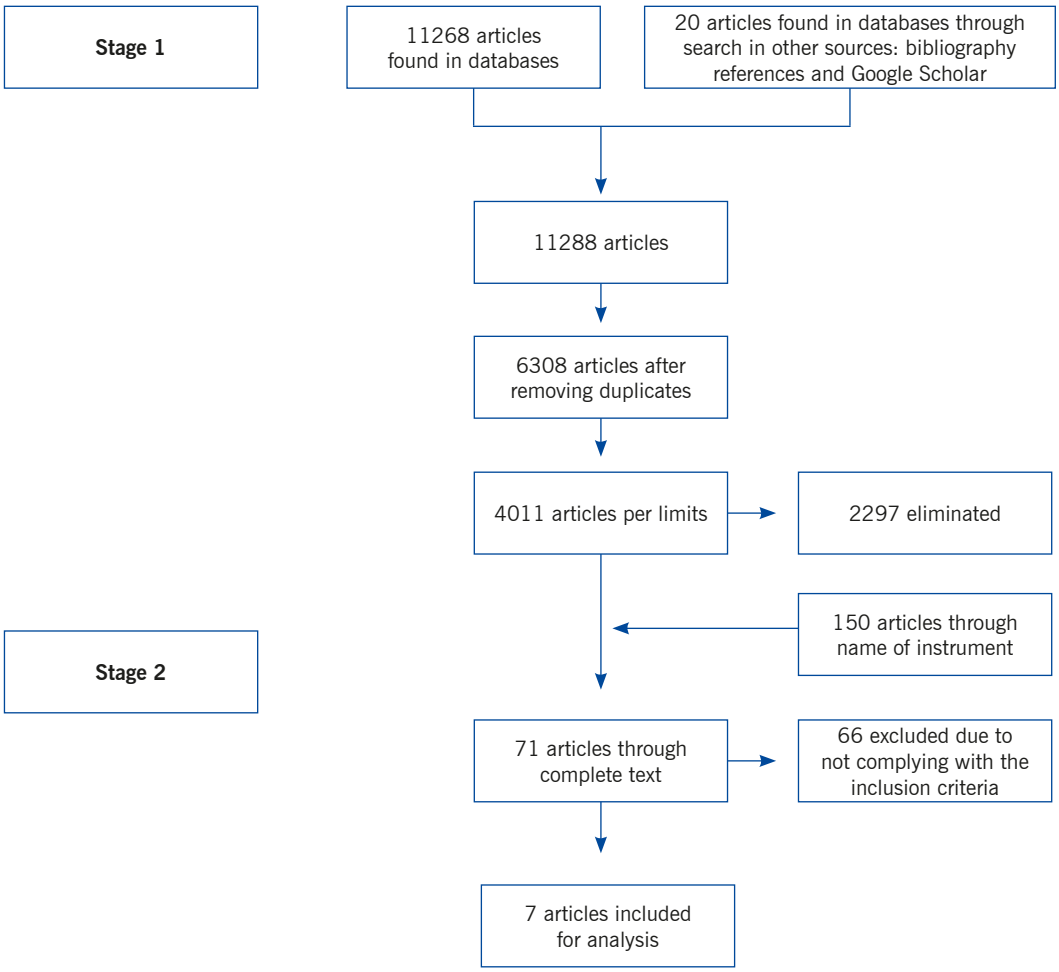

Figure 1. Flowchart of the article search and selection

Table 1 describes the instruments found in each article. In total, it was possible to identify four instruments: NP-CDSS, Q-DIO, D-CATCH, and PNP; all with a different scoring methodology. With respect to origin, only the PNP is of Latin American origin, against the rest that are of European origin. It may also be noted that the Q-DIO and D-CATCH have been adapted into another language, Portuguese and Italian, respectively. Regarding the way of evaluating, only the NP-CDSS does it qualitatively, while the rest do it quantitatively. In relation to the component, only the PNP evaluates attitudes regarding the NCP; the rest evaluate the practices, and none evaluates knowledge or the three components simultaneously.

Table 1. Description of instruments

Müller-Staub *et al.,* (2016). The Netherlands.[27]	**Nursing Process-Clinical Decision Support System Standard Development - NP-CDSS** *Description:* 15 items evaluate NCP as central piece of information and nursing documentation; 10 items evaluate the use of data recovery and additional evaluations. Evaluates the NCP practice qualitatively. *Items*: 25 *Component evaluated*: Practice.
da Costa Linch *et al.,* (2012); *Brazil*[28]	**Quality of Diagnoses, Interventions and Outcomes (Q-DIO – Portuguese version)** *Description:* 11 items evaluate nursing diagnoses as process, 8 items evaluate nursing diagnoses as product, 3 items evaluate nursing interventions and 7 items evaluate nursing results. Each item is scored with a 3-point Likert-type scale; and evaluates the quality of nursing diagnoses and determines the sensitivity of the interventions and results of patient care. *Items:* 29. *Component evaluated:* Practice.
Müller-Staub et al., (2010); Switzerland.[29]	**Quality of Diagnoses, Interventions and Outcomes (Q-DIO)** *Description:* 11 items evaluate nursing diagnoses as process (3-point Likert-type scale), 8 items evaluate nursing diagnoses as product (5-point Likert-type scale), 3 items evaluate nursing interventions (5-point Likert-type scale) and 7 items evaluate nursing results (5-point Likert-type scale). Evaluates quality of nursing diagnoses and determines the sensitivity of the interventions and results of patient care. *Items:* 29. *Component evaluated:* Practice.
da Costa Linch *et al.,* (2015); Brazil.[30]	**Quality of Diagnoses, Interventions and Outcomes Q-DIO – Portuguese version** *Description:* 11 items evaluate nursing diagnoses as process. 8 items evaluate nursing diagnoses as product, 3 items evaluate nursing interventions and 7 items evaluate nursing results. Each item is scored with a 3-point Likert-type scale; and evaluates the quality of nursing diagnoses and determines the sensitivity of the interventions and results of patient care. *Items:* 29. *Component evaluated:* Practice.
Paans *et al.,* (2010); The Netherlands.[10]	**D-Catch** *Description:* 1 item evaluates the structure of the record according with the NCP, 1 item evaluates data on admission, 1 item evaluates nursing diagnoses with the PES structure, 1 item evaluates the interventions (related with the diagnosis), 1 item evaluates the follow up and evaluates results (related with the diagnosis) and 1 item evaluates the legibility of the documentation. Each item is scored with a 3-point Likert-type scale; and evaluates the precision of the nursing documentation in hospitals. *Items:* 3. *Component evaluated:* Practice.
D'Agostino *et al.,* (2015); Italy.[31]	**D-Catch Italian version** *Description:* 1 item evaluates the structure of the record according with the NCP, 1 item appraises data on admission, 1 item evaluates the nursing diagnoses with PES structure, 1 item evaluates the interventions (related with the diagnosis), 1 item evaluates the follow up and evaluates the results (related with the diagnosis) and 1 item evaluates the legibility of the documentation. Each item is scored with a 3-point Likert-type scale; and evaluates the precision of the nursing documentation in hospitals. *Items:* 3. *Component evaluated:* Practice.
Guedes *et al.,* (2013); Brazil.[32]	**Positions on the nursing process – PNP** *Description:* The items represent adjectives evaluated with a 7-point Likert-type scale. Evaluates perception regarding the NCP. *Items:* 20. *Component evaluated:* Attitudes.

Table 2 shows that only two studies[10,27] reported the instrument's creation process, identifying that Müller[27] did not report if the problems identified in the first evaluation by experts were addressed or if the instrument was again tested with these improvements.

With respect to content validity, four studies[10,27,28,31] show evaluation of this aspect; only the D-CATH original [29] reported numerical value with K > 0.62; phase validity was conducted by an average of eight experts (NPCDSS: 8, Q-DIO Portuguese: 9, D-CATCH Italy: 4, D-CATCH original: 12). It was found that in most of the studies the number of experts was < 30; participation by at least two or more researchers was not clearly identified, nor was clarity found on the method and approach to analyze the evaluation data. [33] To evaluate the construct validity, the studies were based on the classical theory, using the most adequate statistical methods for the case: the confirmatory factorial analysis and exploratory factorial analysis. It was established that, overall, all the studies used a sample size classified as very good according to COSMIN[34-39] (seven times the number of items and > 100), as reported by Guedes[32] who proved that the PNP measures the three dimensions proposed in its hypothesis.

Internal consistency was reported by six of seven studies[10,28-32] with Cronbach's alpha values ranging between 0.70 and 0.99, evidencing that, generally, these have good reliability; it must be highlighted that in the evaluation of the methodological quality in the D-Cath original and D-Cath Italy, this value was not calculated in each subscale.

The COSMIN checklist includes transcultural validity, convergent validity, and discriminatory validity carried out in the study by Linch,[30] which identified lack of clarity in reporting similar characteristics of the groups (except for the study variable), as well as the use of a statistical method (***p***) poorly adequate to measure the relations.

It was found that in the Q-DIO original study,[29] reproducibility was evaluated with Pearson's and Spearman's correlation coefficients, which ignore the dependence of the measurements; on the contrary, the Portuguese version was evaluated with the ICC, the most-adequate statistical method to evaluate reproducibility. Intra- and inter-evaluator and agreement correlation values were reported in four studies. Specifically, in the study by Linch,[30] the Q-DIO reported deficient ICC, given that the instrument was more reproducible where the record was electronic without process, followed by electronic with process and poorly reproducible in centers where records were handwritten and without standardized language.

No study reported validity of criterion, error measurement, or response capacity.

Among the limitations and recommendations described by each study, performance is highlighted of validation studies with a broader sample, which include settings different from the hospital, as well as the application of transcultural adaptation processes to test them at international level. Likewise, it is recommended to conduct elaboration processes of operational definitions for the items of the instruments to facilitate standardization of their application. Finally, the study highlights the usefulness of nursing records as important source of data for research.

Table 2. Analysis of the quality of the evaluation of the psychometric properties of the instruments

Name of the instrument - Version	*n*	Analysis unit	Design process	Content validity	Construct validity	Internal consistency	Transcultural validity	Reproducibility	Error measurement	Validity of criterion	Convergent validity and or groups	Response capacity
NP-CDSS original [27]	27 8	Clinical nurses Experts	-	+	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Q-DIO Portuguese[28]	40	Registries	N/A	+	N/A	++	N/A	N/A	N/A	N/A	N/A	N/A
Q-DIO original[29]	60	Registries	N/A	N/A	N/A	+++	N/A	-	N/A	N/A	N/A	N/A
Q-DIO Portuguese[30]	168	Registries	N/A	N/A	N/A	+++	+	+	N/A	N/A	Convergent: + Groups: +	N/A
D-Catch original[10]	245	Registries	-	+	+++	+	N/A	N/A	N/A	N/A	N/A	N/A
D-Catch Italy[31]	250 40	Registries Pilot Registries	N/A	+	+++	+	N/A	N/A	N/A	N/A	N/A	N/A
PNP original[32]	632 973	Nurses Aides	N/A	N/A	+++	+++	N/A	N/A	N/A	N/A	N/A	N/A

Very well (+++), Adequate (++), Doubtful (+), Inadequate (-), N (does not apply)

Discussion

Although instruments to evaluate the nursing process started being developed since 1994,[33] this review permitted evidencing that the instruments that have been adapted most transculturally, used and validated, have been the Q-DIO and D-CATCH, which evaluate NCP application in the practice, through the review of nursing records; however, these instruments have measurements for the dimension of Practices or Behaviors, without finding measurement for knowledge and attitudes. The difference lies in that the first evaluates quantitatively its items and the latter does so quantitatively and qualitatively; in turn, the distribution of the questions differs in the amount (29 and 6, respectively) and the orientation of their evaluation. The foregoing

contrasts with instruments, like the Application of the Nursing Process in Health Institutions (APEIS, for the term in Spanish),[36] found in the literature search and which has items to evaluate the three KAP dimensions, reporting adequate internal consistency with Cronbach's alpha of 0.854; nevertheless, the article evaluated reports no description of the methodological process and analysis of the psychometric properties; hence, it did not comply with criteria to be included in the score of methodological quality of this systematic review.

Another important aspect to highlight is that only one instrument included in this review was created and evaluated for Latin America, titled Positions on the Nursing Process (PNP) original[32] in Portuguese that measures perceptions of the Nursing process on a self-filled form, which together with other instruments, like APEIS[40] and the instrument used for the situational diagnosis of the systematization of nursing care in a basic health unit, as self-filled instruments, were not included in this review because no report was found of the evaluation process of psychometric properties. The D-CATH[10] is proposed as another adequate instrument to evaluate the quality of the records; given that this review found no articles that showed its use in Latin America, transcultural adaptation and evaluation of psychometric properties in this context would be important.

To minimize biased or undue results that lead to erroneous conclusions in studies,[41] emphasize that every instrument must be evaluated and validated prior to being used; according to them, it was possible to observe that, although the face validity reported by all the instruments in this review was relevant, the content validity was not reported in the same manner, which would give more support to the instrument's conceptual description. Moreover, an instrument with construct validity will permit[42] determining the integration of the conceptual abstraction for applicability; said estimation was performed on the Q-DIO, PNP and D-CATCH instruments (original version and Italian). Lastly, the validity of criterion that would permit approaching the praxis beyond the conceptualization was not reported in any of the instruments reviewed in this study. These types of studies should have the sample size, which must have a participant/item rate >10 and, in this review, four studies coincided with this sample.[43] The study by Paans[18] reports values that indicate good reproducibility and internal consistency, like psychometric properties of the Cat-ch-ing, QOD and Scale instruments for degree of accuracy in Nursing diagnoses, characteristics that coincide with the D-CATCH and Q-DIO v, formulated from those mentioned previously and evaluated since 2010.

None of the instruments reported measured in general the precision of the PE documentation in the electronic health records; based on that, in 2016 Müller developed the NP-CDSS standard,[20] to which face and content validity tests were performed and given that it is in the initial stages, the possibility is contemplated of including it in future systematic reviews that evidence progress in its validation. The instruments continue in their process of validation and appropriation to the reality in the health services.

Among the limitations of validating the instruments analyzed, it is mostly found that the data collection was conducted retrospectively with the review of records made with an antiquity of two years, which can be interpreted as information bias, given that the recommendation[44] is for the instruments to be applied to the records in the least time possible after being written to permit clarifying the existence of data or their location and, thus, diminish this bias. Few studies describe the calculation of the sample size and another limitation evidenced was the stratification of the sample without considering it in the analysis; without evaluating if said stratification alters the results of the psychometric tests.[45]

Conclusion. This review shows the progress

and relevance in measuring content and construct validity by using the classical theory of psychometry, of instruments that strengthen the follow up of the application of the NCP in health institutions; but the need persists to conduct comparative studies of the instruments in practical contexts and in the electronic records of the NCP; as well as the use of theories of response to the item to measure the construct and criterion validity. In spite of the evident evolution of the instruments to evaluate the implementation of the NCP, there is still need for an instrument to measure the three KAP aspects in all the stages of the process, with the rigor of the validation and report of its psychometric properties, for its application in the practice.

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