UNIVERSIDAD
DE ANTIOQUIA
1803

Investigación y Educación en Enfermería

–Nursing Research and Education–

Vol. 40 No1, January-April 2022 • ISSNp: 0120-5307 • ISSNe: 2216-0280

UNIVERSIDAD
DE ANTIOQUIA
1803

Investigación y Educación en Enfermería

–Nursing Research and Education–

Vol. 40 No. 1, January - April 2022 • ISSNp: 0120-5307 • ISSNe: 2216-0280

Indexed by

MEDLINE/PUBMED
PubMed Central
Europe PubMedCentral
Scopus
SciELO Colombia
SciELO Citation Index in Web of Science
International Committee of Medical Journal Editors
PUBLINDEX
LATINDEX
REDALYC
AMELICA
CUIDEN
LILACS-BIREME
DIALNET
RedEDIT
EBSCO Fuente académica
DOAJ
ELSEVIER EMcare
ProQuest
Ulrich Global Series Directory
Google Scholar
DORA signatory

This issue had financial support from the Committee for the Development of Investigation –CODI- of Universidad de Antioquia

President: John Jairo Arboleda Céspedes

Nursing School Dean: Claudia Patricia Lopera Arrubla

Head of the Research Center at Nursing School: Beatriz Elena Arias Lopez

Editor in Chief: María de los Ángeles Rodríguez Gázquez

External Editorial Board
Carmen de la Cuesta y Benjumea; Universidad de Alicante, Spain
Cristina García-Vivar, Universidad Pública de Navarra, Spain
Edelmira Castillo Espitia; Universidad del Valle, Colombia
Edith Elina Rivas Riveros; Universidad de la Frontera, Chile
Gladys Eugenia Canaval Erazo; Universidad del Valle, Colombia
Isabel Amélia Costa Mendes; Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo, Brazil
José Ramón Martínez Riera; Universidad de Alicante, Spain
José Rafael González López; Universidad de Sevilla, Spain
José Verdú Soriano; Universidad de Alicante, Spain
Manuel Alves Rodrigues; Escola Superior de Enfermagem de Coimbra, Portugal
Martha Lucía Vásquez Truissi; Universidad del Valle, Colombia
Martha Lilia Bernal Becerril; Universidad Nacional Autónoma de México, Mexico
Miguel Richart Martínez; Universidad de Alicante, Spain
Neusa Collet; Universidade Federal da Paraíba, Brazil
Olga Lucia Cortés Ferreira; Fundación Cardioinfantil, Colombia
Rafael Fernández Castillo; Universidad de Granada, Spain
René Mauricio Barría Pailaquilen; Universidad Austral, Chile
Sonia Semenic; University of McGill, Canada
Vijayalakshmi Poreddi; National Institute of Mental Health and Neuro Sciences, India

Internal Editorial Board
Diego Alejandro Salazar Blandón; Universidad de Antioquia, Colombia
Jasmín Cacante Caballero; Universidad de Antioquia, Colombia
Luz Estela Varela Londoño; Universidad de Antioquia, Colombia
Marcela Carrillo Pineda; Universidad de Antioquia, Colombia
María Eugenia Hincapié Zapata; Universidad de Antioquia, Colombia

Editorial Assistants
Melissa Mesa Ramírez; Universidad de Antioquia, Colombia
Santiago Ríos Guiral; Universidad de Antioquia, Colombia

Publication date: March 1st 2022

Short title: Invest. Educ. Enferm.

ISSNp: 0120-5307, **ISSNe:** 2216-0280

Published by: Facultad de Enfermería de la Universidad de Antioquia, Colombia

Contents

Editorial

Original Articles

Contents

Editorial

UNIVERSIDAD
DE ANTIOQUIA
1803

Contribution of students in the evaluation of master's and doctoral programs in the field of nursing

José Erivelton de Souza Maciel Ferreira[1,4]
https://orcid.org/0000-0003-2668-7587
Lídia Rocha de Oliveira[2,4]
https://orcid.org/0000-0001-7716-1388
Tahissa Frota Cavalcante[3,4]
https://orcid.org/0000-0002-2594-2323

Descriptors: health postgraduate programs; education, nursing, graduate; teaching; higher education institutions; nursing.

Descriptores: programas de posgrado en salud; educación de postgrado en enfermería; enseñanza; instituciones de enseñanza superior; enfermería.

Descritores: programas de pós-graduação em saúde; educação de pós-graduação em enfermagem; ensino; instituições de ensino superior; enfermagem.

Modern nursing has gained more space and scientific recognition. As a result, health postgraduate programs, including postgraduate education in nursing, are being increasingly expanded and implemented in numerous universities, higher education institutions, public and private colleges and institutes in several countries of the world. At the same time, more

---

[1] Nurse, Master's Student in Nursing.
Email: eriveltonsmf@gmail.com

[2] Nurse, Master's Student in Nursing.
Email: lidiarocha2021@gmail.com

[3] Nurse, Ph.D. Adjunct Professor.
Email: tahissa@unilab.edu.br

[4] Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil.

How to cite this article: Ferreira JESM, Oliveira LR, Cavalcante TF. Contribution of students in the evaluation of master's and doctoral programs in the field of nursing. Invest. Educ. Enferm. 2022; 40(1):e01.

DOI: https://doi.org/10.17533/udea.iee.v40n1e01.

nurses have sought qualification in the field of teaching, research and professional practice, thereby resorting to master's and doctoral programs, specialization programs and MBA courses. Master's and doctoral programs are the most sought after in the world nowadays. This demand has required from bodies responsible for education that these programs find new ways of qualifying the training of professionals who decide to ascend in the academic career. Therefore, having broken the banking model of education in higher education in most countries of the world, postgraduate students started to contribute directly to the qualification of these programs, even though their contribution still needs more recognition and seriousness in educational institutions.

The liberating perspective of education defended by Paulo Freire(1) was fundamental for the recognition of the student as an agent capable of improving the classroom itself, as it broke the hierarchical logic between those who transfer and those who receive knowledge, prioritizing horizontality in this relationship. As this perspective of education began to be mirrored and used as a basis for postgraduate teaching in many countries, there was a greater acceptance of the postgraduate student as an active participant in the evaluation of these programs – especially in the countries of America, Africa and Europe, continents where Freire's pedagogical proposal is adopted in teaching.

In the last two years, the scenario imposed by the COVID-19 pandemic forced these higher education institutions to reorganize their ways of operating.(2) In addition, they also had to review their forms of evaluating the quality of their postgraduate programs. Such changes were not only intended to accompany the emergency health measures imposed, but also to continue the development of their teaching, research, extension, management and care activities with excellence.(3) This new pandemic scenario has placed expectations on these programs, especially regarding their students' scientific and technical contributions concerning this calamitous public health problem.(4) Therefore, embracing and discussing the demands of this public is necessary and important, even to generate new reflections, for example, on the entry of postgraduate students in Latin American countries.

Note that a low percentage of people in the world manage to enter higher education, and of these, few choose or have access to an academic career through master's or doctoral studies.(5) In a more global analysis, this results from several factors and conditions permeating inequalities of social class, gender and race, even in a context of educational expansion.(4) Allied to the aforementioned factors and conditions, is the fact of not publicizing the relevance of postgraduate programs for the professional and academic career of professionals since undergraduate studies. These aspects can negatively interfere in students' critical and analytical capacity, which is a quality of a good researcher attending a program that needs his/her contribution to be improved.

In view of this, scientific production and thinking must be stimulated during undergraduate studies, so researchers can perform better in postgraduate studies, especially in academic master's and doctoral programs. This incentive is justified because postgraduate students produce science and technical materials, and the survey of their production throughout the program is an important quality assessment criterion to be considered. All these aspects are essential to consolidate these subjects' training and maintain the quality of programs.(6)

However, professionals who choose to enter a postgraduate program should not only emphasize their academic-professional profile based on ethical-aesthetic-political attitudes, or by their willingness to fulfill the mission and philosophy of the program and produce science within his area. Their role as students of the program is also to seek solutions and answers to the various critical nodes surrounding educational institutions themselves from a political, social and economic perspective, as well as their influence on the development of master's and doctoral students. These subjects' involvement in technical production and their contribution to social responsibility and innovation are necessary.

Over the years, postgraduate programs had to seek means of self-evaluation to correct existing flaws in their operationalization, and the instances above them had to guide strategies and methods to properly evaluate them.(7) Since students are part of the program, they are relevant in this process. Their contributions can innovate and expand curricula and the formation of interests that favor the program and the interests of student themselves and their advisors, which has been strongly perceived in the current pandemic scenario. Thus, taking the participation of students seriously in the evaluation of these programs will contribute to a more realistic evaluation of their processes, procedures, instruments and results. The dedication of students to the program reflects not only in their professional prominence, but also in the growth of the program and the institution to the point of becoming a reference educational establishment.

Students have the know-how to evaluate their postgraduate programs and the right to seriousness and respectful listening especially regarding the following demands: the faculty, management and the dynamics of operationalization of the program. Undoubtedly, this type of evaluation forms and consolidates a highly qualified program. Positive rates related to the quality of the program contribute substantially to achieve greater federal, state and municipal financial incentives for financing relevant, transformative and high-impact research of students.

Since the last century, master's and doctoral programs in nursing have sought to overcome the Cartesian paradigm still present in the academic environment, which is based on the assumption that in order to know the whole, it is necessary to fragment it.(8) With this in mind, students need their guaranteed inclusion in committees dedicated to managing the evaluation processes of these programs. This is necessary to continue breaking this paradigm that is still present in so many internationally renowned institutions.

The training of master's and doctoral students in nursing contributes to produce new forms of knowledge in the field of nursing and health sciences in general.(9) Therefore, the educational institution must recognize that these subjects are continuously immersed in a process of maturation of their social role as masters and/or doctors in the academic, scientific and sociopolitical environment hence, they can directly contribute to the evaluation of these programs. Given all considerations presented, listening to their demands is important, urgent, to improve the quality of these programs in terms of strategic planning for teaching and management.

References

1. Medeiro FCN. A perspectiva libertadora da educação: uma análise do pensamento freiriano e suas contribuições na atualidade. Ver. Int. Ação. 2020; 45(3):874-89.
2. Mata LRF, Pessalacia JDR, Kuz-nier TP, Neto PKS, Moura CC, Santos FR. Daily lives of university students in the health area during the beginning of the Covid-19 pandemic in Brazil. Invest. Educ. Enferm. 2021; 39(3):e07
3. Schirmer J, Balsanelli AP. Coping strategies during the COVID-19 pandemic in nursing school. Acta Paul. Enferm. 2020; 33:e-EDT20200006.

4. Russell K, Juliff D. Graduate Nurse Transition Programs Pivotal Point of Participants' Practice Readiness Questioned During the COVID-19 Pandemic Crisis: A Scoping Review. J. Contin. Educ. Nurs. 2021;52(8):392-6.
5. Carvalhaes F, Ribeiro CAC. Estratificação horizontal da educação superior no Brasil: Desigualdades de classe, gênero e raça em um contexto de expansão educacional. Tempo Soc. 2019; 31:195-233.
6. Mendonça GMM, Cestari VRF, Rodrigues LN, Samapio MOM, Freitas MC, Guedes MVC. Scientific production of grades of a post-graduation program in nursing. Rev. Pesq. Cuid. Fundam. Online. 2018; 10(2):485-9.
7. Barata RB. Necessary changes in the evaluation of graduate programs in Brazil. Interface (Botucatu). 2019; 23:e180635.
8. Barbosa MA. A influência dos paradigmas cartesiano e emergente na abordagem do processo saúde-doença. Rev. Esc. Enf. USP. 1995; 29(2):133-40.
9. Guimarães EAA, Gontijo TL, Rodrigues SB. *Stricto sensu* graduation in nursing and the formation of researcher nurses. Rev RECOM. 2019; 9:e3602.

The Low Voices: Quality, Ethics, and Reach of Qualitative Data*

Carmen de la Cuesta-Benjumea[1]
https://orcid.org/0000- 0003-2160-392X

Original article

Introduction

The low voices
…these are the voices of children, the women who speak
to themselves, the emigrants, the dead, the animals…
The voices of those who do not want to dominate
and feed themselves on words and tales
(Manuel Rivas)

It may be stated that qualitative texts harbour a set of voices that, as if they were drawings, seek to sensitize and, ultimalely,ultimately– transform those who listen to them. These voices come from participants in studies, from

---

[1] Nurse, PhD. Full Professor, Universidad de Alicante, Spain. Email: ccuesta@ua.es

* Clarification. This article is based on the key-note speech given by the author during the 9th Iberian-American Congress on Qualitative Research -Montevideo, Uruguay, 13-15 October 2021.

Conflicts of interest: None.
Receipt: November 10, 2021.
How to cite this article: Cuesta-Benjumea C. The Low Voices: Quality, Ethics, and Scope of Qualitative Data. Invest. Educ. Enferm. 2022; 40(1):e02
DOI: https://doi.org/10.17533/udea.iee.v40n1e02.

Investigación y Educación en Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

ourselves, researchers, and from others who have preceded us and who speak to us from the literature. Our research studies set off from participant's lived experience lived and, when interpreted, express the universal in the particular, as in the drawings by Goya who, by using images he took from the streets, expressed the pain and loneliness of people (Figure 1) and denounced events that occurred during the war, which over two-hundred years later still shudder and overwhelm us (Figure 2). Thus, similarly, carefully chosen and wisely combined in research reports, they, the low voices, will move those who read them into situations and experiences evoking potentially transformative images.

Carlos Castilla del Pino, Spanish psychiatrist during the 1950s reports in his memoires that: "his life was changed when he saw the resignation and humiliation of the families of the sick who came walking from the villages and slept on a bench in the street, overwhelmed by a disease they did not understand, which hurt them and they did not know how to fix".(1) How is it possible "to see" resignation and humiliation? How does a health professional gain awareness of the suffering, disorientation, and sorrow of people? I believe that in order "to see" the subjective experience, it is necessary to have listened to it first.

Therefore, among all the voices that make up our research studies, this paper focused on the voices of the participants, the low voices who do not wish to dominate and who convey to us experiences of resignation, personal growth, or resistance and precisely for this reason, they cause a dent. Technically, this work is about qualitative data. I will first examine its nature; something to which little attention has been paid in the literature, then I will address the issue of obtaining qualitative data. I will end by exploring the reach of qualitative data in health care. I understand the importance of those working in health care to be sensitive, like Castilla del Pino, to see what is not visible to the naked eye. Health systems require compassionate individuals, people sensitive to suffering and willing to alleviate it. I am convinced that this sensitivity occurs when listening to the low voices, that is, when reading some studies that contain authentic qualitative data. I sustain that without quality data, it is not possible for a study to fulfil its transformative objective, that without ethically obtained data there is no legitimacy of the study and, hence, the study is questionable. Quality and ethics are two requisites for the transforming potential of qualitative research to be expressed. As qualitative health researchers, transformation in health care is our goal.

The nature of qualitative data: their quality

In my opinion, the nature of qualitative data has been taken for granted and the definition that qualitative data is "that which is not numerical" has prevailed. Hence, I see it necessary to explore its nature, given that the quality of a study begins with its data.(2) Qualitative data must reflect the true essence of qualitative research, which is that of gathering the voice and perspective of whomever participates of an experience, Charmaz(3) illustrates it in the following text:

> "Cristina suffers from chronic diseases and from their spirally increasing consequences. Her physical stress, frustration, and anger for the life she lives, her sadness, shame and uncertainty, all of which cause her suffering. Cristina talks a bit of the pain, and a lot of how difficult her life is made by the disability and the lack of money" (p.374)

In qualitative health research, we study how health-disease situations affect daily the lives of people knowing that what we capture are representations of a world, the subjective world, that cannot be captured directly.(4) Qualitative data are experiences interpreted and symbolized through words, thereby, they are mediated. In English, data obtained in research studies are denominated "raw"; in Spanish, we call them gross, but qualitative data are neither raw or gross. They are rich in a sense of abundance rather than of gastronomy.

Rich data are descriptive, detailed, and subjective. They present feelings, situations and events that are experienced first-hand by participants of the study in given situations, that is, qualitative data are specific. Let us see an example. Laura, during an interview, talks about her disease:

> "This disease really has serious consequences for me, to say: I am already limited, I can't have more children", and maybe I would not have had more, but it has taken away the possibility of having them. It is silly, you think about it later, but yes, it's like that".

As a matter of fact, , the best way to express the quality of qualitative data is through the concept of richness. Knowing that we seek rich data, it provides us with a compass when, as researchers, we go out into the field to meet with people. Although we do not know exactly what it is we are looking for, but we must be clear about the aspect of that quality qualitative data has. Otherwise, we could end up gathering irrelevant, abstract and scattered information.

Rich data of quality must in addition be focused and complete. Richness is, thus, in terms of variety related to an issue, phenomenon or experience. Through rich data, we talk about something, not about everything. The data just quoted says little by itself. to be meaningful, these data should be linked to other data to become a category, theme or concept. In the above example, data are part of a category named "Not being the same person one used to be" that emerged in a study on the experience of living with chronic kidney disease. With this comment, we are now moving to the issue of data being intertwined with analysis and, thus, setting apart from the idea that qualitative data is simply the information that a tape recorder, a field diary or a document collects without trouble.

To explain the concepts of focused data and complete data, I will use a scene from everyday life in 1560 represented in the work by Flemish painter, Brueghel, titled "Children's games". In the same way that words trigger images, images trigger words and feelings. Thus, when contemplating this work for the first time, it can overwhelm us by the number of characters, details, information (Figure 3). In a closer look, we realise that, although varied, it deals with something specific, that it is focused on a theme and that is presented in complete manner, but not exhaustively. Thus, for example, we can identify diverse types of games (Figure 4), which vary the number of participants and where adults also participate (Figure 5). The images show children playing in Europe in the 16th century, as well as depict the joy of playing (Figure 3 and Figure 6).

Focusing the data technically entails analysing it as we obtain it. Psychologically, focusing implies overcoming the fear of losing something important and giving up the idea of being exhaustive, ideas inherited from positivism. I know that giving up is not easy as it implies getting rid of some data that has been worked on hard and which we sense as valuable. But we must choose a path, take a route, or commit to an idea, we do not give up for nothing, but rather, to make the study feasible. If we do not do that, we will find ourselves overwhelmed or drowned in a mass of data, lost in details. We must, therefore, resist the temptation to say little about a lot.

The truth is, we gather more data than what we need. A good strategy to use these data, is to consider setting them aside for another study or just using them to complete and validate the topic on which the study has been focused. Thereby, we do not betray the study participants nor silence their voices; two moral issues that can unsettle us.

Relating to focusing, a question that students repeatedly ask is: How to choose, from all the possibilities that data present, the relevant issue or core experience? The answer is that whatever we choose, it is provisional and in order to choose what is substantial to participant's experience, we connect with their experience. In this endeavour, will come to our aid our theoretical and social sensitivity, our intuition and having spent sufficient time in the field. After hard work, what is substantial in our data will come to us.

Once focused, data must be described completely. Complete description refers to accounting for thesignificant and greatest variety around the issue chosen, theme or phenomenon . With words we construct images, therefore, in this description we must not overwhelm with unnecessary detail.; We must capture the significant without dwelling on the details, show what is is substantial to the experience and describe it completely. A complete description , in my opinion, transmits an idea that captures an essential and subjective meaning, with no holes in it.

In technical terms, complete data refer to saturation, the means that tells us that the data is sufficient to provide an adequate account of an experience or phenomenon. Nevertheless, there is a tendency to confuse saturation with information redundancy, which is the repetition of information. This occurs when the researcher asks the same questions to all the study participants; of course, in this case, a point will come where the answers will be repeated without adding anything relevant. Quantity and depth are two concepts that, regarding qualitative data, cannot be separated. As a matter of fact, the greatest threat to the quality of research is that of scarce and superficial data; these will lead to simplistic and an obvious analysis (5) that will evoke nothing, nor transform anyone.

Focused and complete data make categories, themes, or concepts transcend the specific and connect us to with universal issues. Let us set an example, the category "protective governing "(6) that emerged during a study on high-risk pregnancies; I have used this category to explain data from a study of people with chronic kidney disease and to understand the situation that a colleague whose child has functional diversity was sharing with me. When during our conversation I told her that what she was doing daily in relation with her child was "protective governing", immediately this category readily echoed her experience.

In short, focused, and complete data are already interpreted data. We select from all the collected information, which is data for our study and as the study develops, these selections change. Somehow, we join the voices of the study participants. Low voices that have been constructed as they have been pondered and listened to . This is the subject of the following section.

Obtaining data of quality

It is obvious that qualitative data are not collected, these are not a finished product ready to be removed and it is clear that its quality does not depend on technical procedures. Qualitative data are obtained, and their quality will depend on a process that is, to my understanding, a social process of relations and interactions. Wolcott, an insightful ethnographer, pointed out that "one seeks knowledge in the professional role of researcher, but prays for wisdom in the personal roles that make it possible" (p. 85).(7)

Therefore, I consider it crucial to acknowledge that obtaining qualitative data of quality is linked to the researcher, to the research context, as well as to the study participants. Participants are not mere receptors of our questions, nor containers of experiences ready to be pulled out. The nature of the interactions with participants, the questions we ask during the field work, the instruments we use to obtain data and ethical issues will be matters that condition the quality of the data.

So, obtaining qualitative data is the truly collaborative work that David Sudnow(8) illustrates in his study on the social organization of death:

> I have tried to make friends in each of the hospital units to find out about certain reserved aspects of the wards. Sometimes I was treated with real enthusiasm and the staff also participated in my research. Many County [hospital] [physicians] interns, recently graduated and eager to show me their expertise in the world of biophysical facts, gave me lengthy lectures on the structure of the human body, completed with live observations in the wards. The interns [physicians] themselves, in their eagerness to be useful to me in this regard, have insisted more than once that I «touch here», «place your hand here», «feel this». (p. 14)

Therefore, we, researchers, obtain data through the relations we establish with the study participants. These are relationships of trust constructed during the very act of obtaining data. During these relations, the meaning of the experience is built and negotiated, nothing is imposed. Likewise, when obtaining data, as during any social encounter, we manage impressions, from this, the care we take in our aspect and in presenting ourselves to participants. We are aware that this will impact upon the relations and finally on obtaining data of quality. People talk to us because they like us or because they want to help us, nobody and nothing forces them to do that. Hence, during the field work, we adopt a style that invites to revealing information and to obtaining narratives of subjective depth where affective issues, such as empathy, understanding, care, and sensitivity play a key role on the type of data we obtain.(5)

The voices of the participants in our studies are low, intimate, emotional, and detailed. They are motivated by questions that shape these voices;(2) questions that imply a way of seeing the world and that can prevent or facilitate the emergence of subjective experience. For example, it is not the same to ask a person with functional diversity about their health problem as it is to ask her/him about the problems they face daily due to living in an environment not adapted to her/his functional diversity. As we can imagine, different people´s experiences will be constructed depending on how these questions are formulated. Truly, one of the challenges in obtaining qualitative data is being able to ask from the emic point of view before knowing it. Ethnographers are well aware of this dilemma and, therefore, claim that questions must first be discovered.(9) Hence, solely researchers' empathys and their sensitivity will allow them to reach those deep levels of subjectivity and disclosure of facts, situations, and feelings.

Our first approaches to the experience to be revealed will be exploratory and, in the very process of obtaining the data, we will be like pulling a thread or following the trail of what seems significant to us in order to step-by-step get close to the subjective experience. Thus,the answers to our first questions will became new questions; but this is not done mechanically, rather, it requires researcher's wonder and flexibility.(9) Wonder to discovering our assumptions and flexibility to follow the thread of a story or events without intruding . Within these interactions, it is where data are constructed with participants of our studies; so we must be attentive and be analytical during these interactions.(2) Our questions will shape the story being told, and the way we listen will make it possible. Thereby, it is already clear that the means to obtain qualitative data are instruments in the hands of the researcher; instruments do not have a life of their own. Indeed, the fact that we use a guide to conduct a qualitative interview does not make it qualitative, nor does the fact that we the technique of content analysis of a text make it reveal meanings, nor does a field observation make it reveal cultural themes., A special ingredient must be added to the method, that is, a specific intention.(10) The habit does not a monk make.

Given that obtaining data is achieved through relationships of trust and affection, it isimbued by ethical issues, which, if not given due attention, can do harm and can invalidate a study. Here, reflexivity takes an ethical nature. When we are face to face with study participants , when we are listening to them, asking them questions or accompanying them in their "daily routine of small contingencies" as stated by Goffman(11) (p. 9), we verify that the approval of an ethics committee does not mean that study's ethical issues have been overcome or resolved, as a large part of the ethical issues are emerging in qualitative studies. Thus, Lipson(12) talks about the dilemmas we face when, precisely because of the trust we have built, the study participants can place themselves at danger by providing us with some information, as happened to her in her study with refugees. Gastaldo and McKeever(13) also highlight the issue of how to undo the link with the participants at the end of the study. Although, as has been recognized by various researchers,(2,14,15) it is not uncommon for this link to remain afterwards. Ours relations, being created in the field, are not disposable relations.

In turn, Smet *et al.,*(16) account for the multiple positions researchers can have with the study participants: that of researcher, of clinician, of a temporary family member, and of friend. This multiplicity blurs static notions of the researcher's role and, with it, the ethical ambiguities and moral dilemmas that may arise in the research process.(16)

We must keep in mind that our questions can cause stress or painful memories to participants and we, researchers, must learn to stop on time; although participants allow us to enter their private lives, we must not overstep. Data is not obtained at all costs; its quality must also be ethical. When conveying data to written text, we must take care to present the voices of the study participants honourably, the voices we present in the research texts must not undermine their sense of dignity. Keeping study participants present during the writing is an ethical and moral position that should remain with us.

Qualitative research is a way of being and not of doing, that is, we do what we do because we think and feel in a certain way and this way must be ethical and not technical. Hence, today approaches to obtaining data must be fundamentally empathic, where researchers position themselves in favour of the people or groups they study, hoping to use the results to improve their living conditions and to promote social policies.(17) This parts from conventional approaches in which the objective of data collection was to extract as much data as possible from informants(17) or to gather objective information to be used in a neutral manner. From the moment we, qualitative researchers, are interested in the emic point of view, our studies disturb, challenge the status quo; they contain the seed of transformation. With this matter, ends this paper.

Transformation: the reach of the data

At this point we may ask ourselves, why so much effort? It is precisely the reach of data that justifies it. We work so that, based on rich data, coming from the low voices, people's lives improve. Lina Masana[18], cultural anthropologist expresses it as follows:

> "That [the people interviewed] explain to us as much as they can about their disease experience so that we can learn from it, analyse it and develop proposals that, in honour of applied anthropology, can be put into practice to improve the lives of those affected". (p. 250)

Precisely, everything just said about the kind of data that we must obtain and about the process of obtaining it is, truly, a means to achieve a change that can happen from the very moment in which data are produced. It is well documented,(14) the therapeutic effect that interviews can have for the study participants -especially phenomenological interviews-, as well as their impact on us, researchers. Atkinson(5) states that being a witness, listening, understanding and accepting the life story of another person can be transformative. Data can "help, enable and even obligate researchers to look beyond their privileges" and to recognize where they come from.(19)

Participatory action research and inclusive research, in which people with disabilities collaborate in the research project,(20) clearly demonstrates this transformative effect. To the extent to which we interact and empathize with our study subjects, we become sensitive to their lives, concerns, and desires. Once we, as researchers, have changed and documented what we learnt, this change can reach others. Indeed, our studies, like our data, must be genuine.

In turn, the sociology of health or of medicine has been documenting that health systems have become a sort of bio-medical bureaucracies that process patients with serious failures, such as obstetric violence,(21) racism,(22) and, in general, dehumanization. Recent qualitative studies point to the discrimination that from health services is practiced against vulnerable collectives, like the homeless,(23) people with intellectual disability,(20) immigrants or poor women who professionals see as unreliable and individuals with little credibility.(24) The deficient conditions of public health services with the irresponsible cutbacks of staff and resources have been exposed during this pandemic, as well as the devastating effect that these conditions have on the health care workers.

In this regard, what can we do? Truly qualitative data allow us to craft a scientific text that persuades readers and moves consciences, which transfers images upon which one cannot be indifferent. Low voices well-articulated and well-heard may not change the world, but do intensify awareness and, as the poet says, "a more intense awareness can act upon the circumstances".(25) I believe the challenge for the 21st century is to pay attention to the low voices and act accordingly.

Figure 1. Goya. This is how useful men often end up. 1808-14. Notebook C page 17.

Figure 2 A and B. Goya: The disasters of war. Drawings made between 1810 and 1815

Figure 3. Pieter Bruegel the Elder, Children's games (1560).

Figure 4. Pieter Bruegel the Elder, Children's games (1560) Detail.

Figure 5. Pieter Bruegel the Elder, Children's games (1560) Detail.

Figure 6. Pieter Bruegel the Elder, Children's games (1560) Detail.

References

1. Ailouti M. Entrevista a Almudena Grandes “Esta novela cuenta un hoyo. En los años 50 no había esperanza de nada” [Internet]. El Cultural. 6 Feb 2020. Available from: https://elcultural.com/almudena-grandes-esta-novela-cuenta-lo-que-para-mi-es-un-hoyo-en-los-anos-50-no-habia-esperanza-de-nada
2. Charmaz K. Constructing Grounded Theory. Thousand Oaks. California: SAGE; 2014.
3. Charmaz K. Stories of Suffering: Subjective Tales and Research Narratives. Qual. Health Res. 1999; 9(3):362-82.
4. Dezin NK, Lincoln YS. Introduction: The Discipline and Practice of Qualitative Research. In: Dezin NK, Lincoln YS. The SAGE Handbook of Qualitative Research. 4th Ed. Thousand Oaks, California: SAGE; 2011. p.1-19.
5. Atkinson R. The life story interview. Qualitative Research Methods series 44. Thousand Oaks: SAGE; 1997.
6. Corbin Women’s perceptions and management of a pregnancy complicated by chronic illness. Health Care Women Int. 1987; 8(5-6):317- 37.
7. Wolcott, H F. The art of fieldwork. 2nd edition. Walnut Creek: Altamira Press; 2005.
8. Sudnow D. La organización social de la muerte en el hospital. Buenos Aires: Tiempo contemporáneo; 1971.
9. Guber R. La etnografía, método, campo y reflexividad. Bogotá: Norma; 2001.
10. Wolcott H F. En búsqueda de la esencia etnográfica. Invest. Educ. Enferm. 2003; 21(2):122-38.
11. Goffman E. Internados. Ensayos sobre la situación social de los enfermos mentales. Buenos Aires: Amorrortu editores; 1992.
12. Lipson J. Asuntos éticos en la etnografía. In: Janice Morse (Editor) Asuntos críticos en los métodos de investigación cualitativa. Medellín, Colombia: Facultad de Enfermería de la Universidad de Antioquia. 2003; p.389-415.
13. Gastaldo D, McKeever P. Investigación cualitativa, ¿intrínsecamente ética? Index Enferm: 2000; 28-9.
14. Oakley A. Interviewing Women Again: Power, Time and the Gift. Sociol. 2016; 50(1):195-213.
15. Wolcott, H. F. Sneaky Kid and Its Aftermath: Ethics and Intimacy in Fieldwork. Walnut Creek: Altamira Press; 2002.
16. de Smet S, Rousseau C, Stalpaert C, De Haene L. “I Look at You and See You Looking at Me”: Role Boundaries in a Dynamic Research Relationship in Qualitative Health Research with Refugees. Qual. Health Res. 2020; 30(7):1083-100.
17. Fontana A, Frey JH. The Interview from Neutral Stance to Political involvement, In: Dezin NK, Lincoln YS. The SAGE Handbook of Qualitative Research, 3rd Ed. Thousand Oaks, California: SAGE; 2005. p.695-728.
18. Masana L. Entre médicos y antropólogos La escucha atenta y comprometida de la experiencia narrada de la enfermedad crónica. In: Martínez A, Di Giacomo SM, Masana L. Evidencias y narrativas en la atención sanitaria: Una perspectiva antropológica. Tarragona: Publicaciones URV; 2013. p.223-63.
19. Charmaz K, Belgrave LL. Thinking About Data with Grounded Theory. Qual. Inq. 2019; 25(8):743-53.
20. Schwartz AE, Kramer JM, Cohn ES, McDonald KE. “That Felt Like Real Engagement”: Fostering and Maintaining Inclusive Research Collaborations with Individuals with Intellectual Disability. Qual. Health Res. 2020; 30(2):236-49.
21. Castro R, Erviti J. Sociología de la práctica médica autoritaria: violencia obstétrica, anticoncepción inducida y derechos reproductivos. México: Centro Regional de Investigaciones Multidisciplinarias Universidad Nacional Autónoma de México; 2015.
22. Hamed S, Thapar-Björkert S, Bradby H, Ahlberg BM. Racism in European Health Care: Structural Violence and Beyond. Qual. Health Res. 2020; 30(11):1662-73.
23. Moore-Nadler M, Clanton C, Roussel L. Storytelling to Capture the Health Care Perspective of People Who Are Homeless. Qual. Health Res. 2020; 30(2):182-95.
24. Groot B, Abma T. Participatory Health Research with Mothers Living in Poverty in the Netherlands: Pathways and Challenges to Strengthen Empowerment. Forum Qual. Soc. Res. 2020; 21(1): Art. 8.
25. Rodriguez MJ. Entrevista a Antonio Gamoneda “Todo hambriento es un micro economista” [Internet]. El País, Babelía, 8 Feb 2020. P.9. Available from: https://elpais.com/cultura/2020/02/07/babelia/1581091598_442947.html

Original article

UNIVERSIDAD DE ANTIOQUIA
1803

Male Nursing Students' Perception of Gender Barriers in Nursing Curricula in an Iranian University of Medical Sciences

Fahimeh Alsadat Hosseini[1]
https://orcid.org/0000-0001-5943-9294
Kobra Parvan[2]
https://orcid.org/0000-0002-5539-9712
Maryam Shaygan[3]
https://orcid.org/0000-0002-1456-9340
Brian Thomson[4]
https://orcid.org/: 0000-0002-0111-1904

Male Nursing Students' Perception of Gender Barriers in Nursing Curricula in an Iranian University

Abstract

Objective. The present study aimed to determine male nursing students' perception of gender barriers in nursing curricula. **Methods.** This descriptive study was conducted on 150 B.Sc. and M.Sc. nursing students at Tabriz School of Nursing and Midwifery, Tabriz university of medical sciences, Tabriz, Iran that were selected through convenience sampling. The study data were collected using Inventory of Male Friendliness in Nursing Programs-Short (IMFNP-S). This scale has 17 items for investigating male nursing students' perception of gender barriers in nursing curricula. Each item is a 5-point Likert-type scale scored from 0 to 4; total scale score could range from 0 to 68, higher scores representing male nursing students' perception of less gender barriers in nursing curricula. **Results.** The total mean score of gender barriers was 35.11+6.15. The most important barriers included

1 Nurse, Ph.D. Shiraz University of Medical Sciences, Shiraz, Iran. Email: fhoseini221@gmail.com
2 Nurse, M.Sc. Tabriz University of Medical Sciences, Tabriz, Iran.
E mail: parvank@yahoo.com. Corresponding author.
3 Nurse, Ph.D. Shiraz University of Medical Sciences, Shiraz, Iran. Email: m2620.shaygan@gmail.com
4 Nurse, Ph.D. University of the West of Scotland, Paisley, Scotland.
Email: Brian.Thomson@uws.ac.uk

Conflicts of interest: None.

Receipt: May 31, 2021.

Approved: March 3, 2022.

How to cite this article: Alsadat Hosseini F, Parvan K, Shaygan M, Thomson B. Male Nursing Students' Perception of Gender Barriers in Nursing Curricula in an Iranian University. Invest. Educ. Enferm. 2022; 40(1):e03.

DOI: https://doi.org/10.17533/udea.iee.v40n1e03.

Investigación y Educación en Enfermería
—Nursing Research and Education—
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

different requirements/limitations in obstetrics apprenticeship (Median=1), and need for proving oneself because of people's expectation of nurses to be female (Median=2). On the other hand, the least important barriers were lack of important people's support on one's career decisions (Median=3), and lack of opportunity to work with other male nurses (Median=3). The scale score was not associated with the socio-demographic characteristics studied. **Conclusion.** The most male nursing students feel various gender issues in the nursing curriculum in a medium level that may negatively impact on their learning, professional performance and motivation and tendency to nursing. Furthermore, this vicious cycle can lead to lack of professional development, leaving the job and burnout. Thus, creating a gender-neutral environment can make nursing programs more male friendly.

Descriptors: students, nursing; nurses, male; curriculum.

Percepción de los estudiantes varones de enfermería sobre las barreras de género en los planes de estudio de Enfermería en una universidad iraní

Resumen

Objetivo. Describir la percepción de los estudiantes varones de enfermería sobre las barreras de género en los planes de estudio de enfermería. **Métodos.** Este estudio descriptivo se llevó a cabo con la participación de 150 varones estudiantes de enfermería de la Escuela de Enfermería y Partería de Tabriz, Universidad de Ciencias Médicas de Tabriz, Irán, seleccionados mediante un muestreo por conveniencia. Los datos del estudio se recogieron utilizando el Inventory of Male Friendliness in Nursing Programs-Short (IMFNP-S). Esta escala tiene 17 ítems con opciones de respuesta tipo Likert de 5 puntos que se puntúa de 0 a 4; la puntuación total de la escala puede oscilar entre 0 y 68, y las puntuaciones más altas representan la percepción de menos barreras de género. **Resultados.** La puntuación media total de las barreras de género fue de 35.11+6.15. Las barreras más importantes incluían los diferentes requisitos o limitaciones en el aprendizaje de la obstetricia (Mediana=1), y la necesidad de probarse a sí mismo debido a la expectativa de la gente de que las enfermeras sean mujeres (Mediana=2). Por otro lado, las barreras menos importantes fueron la falta de apoyo de personas importantes en las decisiones de la carrera profesional (mediana=3) y la falta de oportunidades para trabajar con otros enfermeros (mediana=3). La puntuación de la escala no se asoció con las características sociodemográficas estudiadas. **Conclusión.** La mayoría de los estudiantes varones de enfermería sienten diversas barreras de género en el plan de estudios de enfermería en un nivel medio, que puede repercutir negativamente en su aprendizaje, motivación, rendimiento profesional y en la tendencia hacia la enfermería. Además, esta situación puede conducir a la falta de desarrollo profesional, al abandono del trabajo y al agotamiento. Así pues, la creación de un entorno neutral desde el punto de vista de género puede hacer que los programas de enfermería sean más favorables a los hombres.

Descriptores: estudiantes de enfermería; enfermeros; curriculum.

Percepção dos estudantes de enfermagem masculinos sobre as barreiras de gênero nos planos de estudo de Enfermagem numa universidade iraniana

Resumen

Objetivo. Descrever a percepção dos estudantes de enfermagem homens sobre as barreiras de gênero nos planos de estudo de enfermagem. **Métodos.** Este estudo descritivo se levou a cabo com a participação de 150 homens que eram estudantes de enfermagem da Escola de Enfermagem e Parteira de Tabriz, Universidade de Ciências Médicas de Tabriz, Irã, que foram selecionados mediante uma amostragem por conveniência. Os dados do estudo se recolheram utilizando o Inventory of Male Friendliness in Nursing Programs-Short (IMFNP-S). Esta escala tem 17 itens com opções de resposta tipo Likert de 5 pontos que se pontua de 0 a 4; a pontuação total da escala pode oscilar entre 0 e 68, e as pontuações maiores representam a percepção de menos barreiras de gênero. **Resultados.** A pontuação média total das barreiras de género foi de 35.11+6.15. As barreiras mais importantes incluíam os diferentes requisitos ou limitações na aprendizagem da obstetrícia (Média=1), e a necessidade de provar-se a si mesmo devido à expectativa das pessoas de que as enfermeiras sejam mulheres (Média=2). Por outro lado, as barreiras menos importantes foram a falta de apoio de pessoas importantes nas decisões da carreira profissional (média=3) e a falta de oportunidades para trabalhar com outros enfermeiros (média=3). A pontuação da escala não se associou com as características sociodemográficas estudadas. **Conclusão.** A maioria dos estudantes de enfermagem homens sentem diversas barreiras de gênero no plano de estudos de enfermagem num nível médio, que pode repercutir negativamente na sua aprendizagem, motivação e rendimento profissional, e tendência à enfermagem. Além disso, esta situação pode conduzir à falta de desenvolvimento profissional, ao abandono do trabalho e ao esgotamento. Assim pois, a criação de um entorno neutral desde o ponto de vista de gênero, pode fazer que os programas de enfermagem sejam mais favoráveis aos homens.

Descritores: estudantes de enfermagem; enfermeiros; currículo.

Introduction

Nurses, as the most important part of the professional force of healthcare systems, are at the frontline of service provision and possess various roles and responsibilities.(1) Therefore, any shortcoming in this group has a direct impact on the quality and quantity of healthcare services and, consequently, the health of individuals and society.(1) Review of the literature indicates that men's presence is crucial in nursing profession.(2) According to a recent research, the number of men pursuing a Bachelor of Nursing degree is slightly more than 10%. Males make up just 9.9% and 6.8% of postgraduate nursing degrees, respectively, such as Master of Science Nursing and Doctoral-Level Nursing degrees.(3) According to the Ministry of Health and Medical Education (MOHME), in Iran women make up roughly 75% of the nursing workforce, while males make up 25%.(4)

Men's role in nursing profession has been neglected.(5) Men are also aware of this fact, but are not highly interested in this regard.(5) This might have resulted from healthcare personnel's gender-based stereotype and inappropriate viewpoint towards men's presence in this profession(5) and it might also be attributed to each region's cultural and social conditions. In other words, men's presence and attitude towards the nursing profession can be different depending on society's perspective, culture, and traditions.(6) These factors affect the role of the nursing profession in society's health and patient care, and give this profession some dimensions that make the negligence of a gender-based perspective undeniable.(7) So, there is a need to develop strategies to attract men to this profession. On the other hand, men are at a higher risk of resignation from nursing programs.(8) Resignation from nursing programs would have an emotional cost, as well, because nursing students would feel ashamed and emotionally exhausted after resigning from nursing program.(9)

Although years have passed since men's presence in the nursing profession, they do not play an effective role in this respect.(5) Men's employment and survival in nursing has turned into a challenge resulting from various educational as well as social barriers.(10) Therefore, with the expansion of nursing programs, men's needs in this profession should be determined.(11) Understanding the barriers that lead to resignation from nursing programs in high-risk populations might be effective in reducing the rate of attrition in this profession.(11) The majority of the research were qualitative (context-based) and focused only on the perceptions of male student nurses about the nursing profession.(12) There are limited studies about the perceptions of male nursing students about gender barriers in nursing curricula. It is quite evident that gender has overshadowed all dimensions of nursing and inattention to this factor could lead to negligence of its impacts on the profession, eventually endangering its survival.(13) There is a need to explore the perceptions of nursing students about nursing barriers in curricula that men are facing. Therefore, the present study aims to determine male nursing students' perception of gender barriers in their nursing curricula.

Methods

Design of the study. This descriptive study aimed to determine male nursing students' perception of gender barriers in nursing curricula at Tabriz University of Medical Sciences in 2020.

Participants. The research population included all male B.Sc. nursing students at the end of the second year to the fourth year of education (*n*=128) and all male M.Sc. nursing students at the end of the first and second year of education (*n*=22) in Tabriz School of Nursing and Midwifery. The study sample size was determined based on a pilot study. The participants included 150 nursing students selected through convenience sampling. The inclusion criteria of the study were being willing to take part in the research, being a B.Sc. or M.Sc. student, being a student at Tabriz University of Medical Sciences, and not being a guest or transfer student.

Instrument. In order to determine the male nursing students' perception of gender barriers in nursing curricula, Inventory of Male Friendliness in Nursing Programs-Short (IMFNP-S) (14) was used. This inventory included demographic information (12 items) and some questions for investigating male nursing students' perception of gender barriers in nursing curricula (17 items). The items could be responded through a 5-point Likert scale with the following options: completely agree, agree, no idea, disagree, and completely disagree. In order to avoid bias, some items were scored reversely. Overall, the items scores could range from 0 to 4 (0: completely disagree and 4: completely agree in positive sentences; 0: completely agree and 4: completely disagree in reverse ones). Accordingly, 0 and 4 represented dominant presence and lack of barriers, respectively. Besides, the scores could range from 0 to 68 with higher scores representing male nursing students' perception of less gender barriers in nursing curricula. This questionnaire was developed by Chad Elis O'Lynn based on a strong review of the literature in 2004. The validity of the questionnaire was approved using nursing experts' opinions. Its reliability was also confirmed by Cronbach's alpha = 0.84.(14)

Ethics. After gaining the approval of the University's Research Council and obtaining ethical approval, the questionnaires were distributed. At first, the participants were explained about the research and its voluntary nature and were reassured about the secrecy and confidentiality of their information. Then, they were invited to take part in the study.

Procedure. After receiving oral and written explanations at the beginning of the questionnaire, they completed the questionnaires through self-report. Data collection was done within two months in 2020.

Data analysis. After all, the data were entered into the SPSS statistical software, version 16. The descriptive variables were analyzed using descriptive (frequency, mean, Standard Deviation -SD). The mean and SD were calculated for the total scale score and for each item the median, minimum, and maximum values were calculated according to Sullivan and Artino's recommendation for the interpretation of Likert-type scale data.(18) For inferential analysis, Kruskal-Wallis and Mann-Whitney tests and Pearson's correlation coefficient were used.

Results

The study participants' demographic characteristics have been presented in Table 1. The mean total score of gender barriers was 35.11±6.15. Based on the study results, five main educational barriers included different requirements/limitations in obstetrics (OB) apprenticeship, need for proving oneself because of people's expectation of nurses to be female, faculty's referral to nurses using feminine prepositions, different treatments against male and female nursing students, and getting nervous after being accused of sexual inappropriateness after touching female patients. On the other hand, the least important barriers were lack of important people's support on one's career decisions, lack of opportunity to work with other male nurses, and lack of content on different communication styles (Table 2).

Table 1. The study participants' socio-demographic characteristics

Socio-demographic variables	
Age; Mean±SD	23.97±4.29
Marital status; *n* (%)	
Single	126 (87.5)
Married	18 (12.5)
Semester; *n* (%)	
3	10 (7)
4	64 (45.1)
5	6 (4.2)
6	32 (22.5)
8	30 (21.1)
Academic degree; *n* (%)	
Bachelor of science	128 (85.3)
Master of science	22 (14.7)
Grade point Average; Mean±SD	15.57±1.36
Family's economic status; *n* (%)	
Income equal to expenses	98 (68.1)
Income less than expenses	20 (13.9)
Income over expenses	26 (18.1)
Ethnic group; *n* (%)	
Turk	130 (89)
Persian	6 (4.1)
Kurd	10 (6.8)
Existence of nurses among family members; *n* (%)	44 (29.7)
Men's faculty activity in nursing school; *n* (%)	112 (77.8)
Informal work experience in nursing; *n* (%)	48 (32.4)
With formal work experience in nursing; *n* (%)	20 (13.5)

Table 2. Gender-based barriers as reported by the respondents

Items	Min	Max	Median
1. Faculty referred to nurse as “she”	0	4	2
2. No history of men in nursing	0	4	2
3. No active recruitment of men	0	4	2
4. Faculty made disparaging remarks about men	0	4	2
5. No content on men’s health	0	4	2
6. No opportunity to work with male RNs	0	4	3
7. Different requirements/limitations in OB	0	4	1
8. No content on different communication styles	0	4	2
9. Not being invited to participate in all student activities	0	4	2
10. Not being encouraged to strive for leadership roles	0	4	2
11. People important to me did not support my career decision	0	4	3
12. I felt I had to prove myself because people expected nurses to be female	0	4	2
13. Male and female students were treated differently	0	4	2
14. Gender was a barrier in developing collegial relationship/faculty	0	4	2
15. I did not feel welcomed by staff RNs	0	4	2
16. I was nervous when a woman would accuse me of sexual inappropriateness when I touched her	0	4	2
17. My nursing program did not prepare me to work with females	0	4	3
Total score on Likert scale	1	3	2
Total score	14	51	34

The results revealed no significant relationships between the students’ socio-demographic features and their total score of gender barriers (Table 3).

Table 3. Relationships between the students' socio-demographic variables and their gender barriers

Variables	*n*	Mean±SD	Statistical tests	*p*-value
Age	142	23.97±4.29	r= 0.09	0.42
Marital status			U=277	0.91
Single	126	35.28±5.65		
Married	18	35.78±5.99		
Semester			χ^2=7.96 Df=4	0.09
3	10	32.40±1.14		
4	64	36.81±6.28		
5	6	28.33±1.03		
6	32	33.81±3.88		
8	30	36.73±4		
Academic degree			U=306	0.49
Bachelor of science	128	35.11±6.35		
Master of science	22	35.09±5.07		
Average score of the course	106	15.57±1.36	r= -0.08	0.56
Family's economic status			χ^2=3.71 Df=2	0.16
Income equal to expenses	98	35.98±5.74		
Income less than expenses	20	31.60±5.98		
Income over expenses	26	34.77±7.08		
Ethnic group			χ^2=1.50 Df=2	0.47
Turk	130	35±6.10		
Persian	6	32±2.64		
Kurd	10	37.60±8.08		
Existence of nurses among family members			U=534	0.65
Yes	44	35.50±3.89		
No	104	35.02±6.95		
Men's faculty activity in nursing school			U=386.50	0.4
Yes	112	35.23±5.81		
No	32	35.19±7.79		
Informal work experience in nursing			U=591.50	0.92
Yes	48	35.17±6.62		
No	100	35.16±6.01		
Formal work experience in nursing			U=296	0.70
Yes	20	37±6.72		
No	128	34.87±6.09		

Discussion

The study findings showed that the male nursing students' mean score of gender barriers was 35.11+6.15. In addition, five main educational barriers included different requirements/limitations in OB apprenticeship (Median=1), need for proving oneself because of people's expectation of nurses to be female (Median=2), faculty's referral to nurses using feminine prepositions (Median=2), different treatments against male and female nursing students (Median=2), and getting nervous after being accused of sexual inappropriateness after touching female patients (Median=2).

In the study performed by Spahr,(16) the mean score of gender barriers was 56.47+9.42. In this study, the students' scores were lower compared to similar studies, which indicates that our participants were faced with more gender barriers. It seems that differences in research settings and students' educational and cultural backgrounds might affect their perceptions of gender barriers. In this context, further researches are required to eliminate gender barriers and improve nursing curricula for male nursing students in Iran.

Experience of working in an OB apprenticeship and fear of being accused of sexual inappropriateness have been mentioned by participants in the present study and other studies conducted on the issue.(17,18) This can lead to considerable stress.(18) Generally, differences/limitations in OB apprenticeship and getting nervous after being accused of sexual inappropriateness are inter-related. Working with women at the time of delivery requires a close and intimate relationship with nurses. Since all such patients are female, OB apprenticeship can be a challenging area for male nurses.(17,18) In fact, the OB apprenticeship is a place where students feel role conflicts.(18) It might be attributed to the fact that female nurses are patients' first priority, particularly in case they require intimate care. This barrier results in a reduction of the complete experience of what must be presented to male nursing students. In other words, male students would have unequal learning in an OB apprenticeship.(19) Of course, limitations in the learning environment are not only affected by patients' lack of interest in having male nurses, but also by nursing instructors' and personnel's lack of tendency to present such care in hospitals.(20) Providing female patients with intimate care is the main factor during the OB apprenticeship.(21) Although touching is a main component of nursing care, it is often considered to be a source of anxiety for male nurses because touching is a feminine feature and might be interpreted as a sexual act when performed by men.(17,18) Thus, educational programs regarding how to use touch are highly essential for male nursing students. In this respect, colleges can help make male nursing students close to patients and their families. It is also necessary to improve communication skills to increase male nurses' compatibility with patients and their spouses.(22) In this regard, informing society about men's position in the nursing profession can be beneficial and decrease male students' tensions in OB apprenticeship.

In the present study, the need to prove oneself because of people's expectations of nurses to be female was one of the most important educational barriers reported by nursing students. This might be attributed to the feminine viewpoint towards the nursing profession(23) as well as higher expectations from male nursing students and graduates in society.(24) One of the main educational barriers for male nursing students was faculty's referral to nurses using feminine prepositions. In other words, nursing instructors are perpetuating the gender stereotype in the nursing profession. Powers *et al.*(25) reported findings about narrow focused nursing programs and that they are learned through a feminine viewpoint. Some nursing schools used a feminine pedagogy because they were afraid of destroying unique nursing qualities.(26) The results also proved that nursing programs continued to stabilize gender-based stereotypes through feminization of the curricula, which could eventually lead to gender dissonance and male students' resentment.(26)Furthermore, evidence has indicated that nurses are still referred to by feminine prepositions(25) and some educational subjects are sexually biased.(26)

As mentioned above, faculty's referral to nurses using feminine prepositions was one of the main gender barriers in the current study. Although changing old verbal patterns might be difficult, it is of particular importance for male nursing students. Similar to other communities, Iranian society has challenged many gender-stereotyped titles over time. This change is also possible in the nursing profession similar to other gender-specific professions. In this context, cultural and social infrastructures for eliminating gender-based views towards the nursing profession are needed to modify instructors' verbal patterns and nursing curricula.

Different treatments against male and female nursing students can be attributed to feminine pedagogy, gender-based bias in the nursing profession, men's practical limitations (e.g. in OB wards), and nursing instructors' thoughts and perspectives. Male nursing students and clinical nurses experienced tokenism and social isolation.(27) On the other hand, Mao *et al.* showed that Males can turn barriers into facilitators and there is no clear line between gender-related advantages and disadvantages as factors impacting professional development.(28) It seems that the creation of infrastructure regarding men's position in the nursing profession, providing authorities with the necessary training, and making society members aware of men's vital role in the nursing profession can play a role in eliminating this barrier. By addressing social stereotypes of femininity and masculinity and promoting the concept of gender neutrality, nursing organizations and nursing education programs can help with recruiting. In order to counteract gender bias and recruit more male students, nursing schools must be more active in their efforts.

In the present study, the least important barriers included lack of important people's support on one's career decisions (Median=3), lack of opportunity to work with other male nurses (Median=3), and lack of content on different communication styles (Median=2). Similarly, Davidson(29) and Spahr(16) mentioned the lack of important people's support for one's career decisions as one of the least important gender barriers. In the previous decades, parents' pressure was a barrier against men's admission to the nursing profession.(30) Fortunately, this barrier has been eliminated to a great extent nowadays. It seems that the labor market and prosperity have been effective in changing families' opinions in this regard. Considering lack of opportunity to work with other male nurses, this opportunity has enhanced by increase in the population of male nursing students and graduates.

In the current study, the students did not consider lack of content on different communication styles to be an important barrier. This might be due to the fact that receiving necessary training regarding communication styles is not highly essential in the nursing profession. The students' unawareness of the importance of communication styles in care provision could play a role, as well.

Limitations and Suggestions. This study was performed on male nursing students in Tabriz University of Medical Sciences. Therefore, the results cannot be generalized to other nursing schools and further studies are needed to determine gender barriers in other nursing schools in different parts of the country. Additionally, this study investigated gender barriers from male students' perspectives. Thus, future studies are recommended to assess nursing faculty's perception in this regard and compare their viewpoints to those of nursing students. Moreover, using observers for judging classes and videotaping classes are suggested as instruments for assessment of sexual and ethnic biases. Finally, the results of the present study were based on the participants' ability to understand questions clearly and remember what had occurred during their training. Although using previously-designed reliable instruments can decrease misinterpretation of questions, further studies are recommended to develop more up-to-date instruments specifically for Iranian culture.

Conclusion. Because of the importance of men's presence in the nursing profession, nursing curricula have to be improved by the elimination of gender barriers for male nursing students. So, in this study, male nursing students' perception of gender barriers in nursing curricula at an Iranian University of Medical Sciences was assessed. The male nursing students' mean score of gender barriers was at a medium level. It shows that most male nursing students feel various gender issues in the nursing curriculum at an average level. This level of gender barriers may have a negative impact on their nursing learning, professional performance, motivation, and tendencies. Furthermore, this vicious cycle can lead to a lack of professional development, leaving the job, fault, and burnout.

Some of the most common gender barriers identified in this study, such as different requirements/limitations in OB apprenticeship, need for proving oneself because of people's expectation of nurses to be female, faculty's referral to nurses using feminine prepositions, different treatments against male and female nursing students, and getting nervous after being accused of sexual inappropriateness after touching female patients, can be a source of stress and tension for male nursing students.

Since male gender can be a risk factor for resignation from nursing programs, these programs should consider the reasons for male nursing students' resignation. Besides, nursing instructors who are mainly female should be aware of their effective role in the creation of a neutral, male-friendly environment. In this regard, being sensitive to students' needs can help male students feel accepted and supported. Providing male students with training about how to face gender barriers can be influential, as well. Making some changes in nursing curricula and the general atmosphere of nursing school can also direct nursing programs towards male friendliness. In fact, the creation of a sexually neutral environment is a necessity for male students' success in such a female-dominant profession. Training nursing personnel in hospitals regarding the elimination of sexual discrimination can help reduce this barrier for male nursing students. Moreover, further studies have to be conducted on gender bias in nursing education and the impacts of this bias on men's employment and survival in the nursing profession.

Fundings: This work was supported by the Medical Education Research Center of Tabriz University of Medical Sciences under Grant TBZMED.REC.1394.221.

References

1. Butler M, Schultz TJ, Halligan P, Sheridan A, Kinsman L, Rotter T, et al. Hospital nurse-staffing models and patient- and staff-related outcomes. Cochrane Database Syst. Rev. 2019; 4(4):CD007019-CD.
2. Flaskerud JH, Halloran EJ. Gender Diversity in Nursing. Issues Ment. Health Nurs. 2018; 39(7):613-5.
3. StatisticStats Male Nursing Statistics. 2019 [cited 1 June 2021]. Available from: https://www.statisticstats.com/health/malenursing-statistics/.
4. Masoumi SJ, Nasabi NA, Varzandeh M, Bordbar N. Gender Equality among Nurses: Promotion Strategies for Gender Equality. J. Health Manag. Inf. Sci. 2020; 7(4):252-8.
5. Arif S, Khokhar S. A historical glance: Challenges for male nurses. J. Pakistan Med. Asso. 2017; 67(12):1889-94.
6. Budu HI, Abalo EM, Bam VB, Agyemang DO, Noi S, Budu FA, et al. "I prefer a male nurse to a female nurse": patients' preference for, and satisfaction with nursing care provided by male nurses at the Komfo Anokye teaching hospital. BMC Nurs. 2019;18(1):47.

7. Ross D. Challenges for Men in a Female Dominated Environment. Links Health Social Care. 2017; 2(1):4-20.
8. de Oliveira DR, Griep RH, Portela LF, Rotenberg L. Intention to leave profession, psychosocial environment and self-rated health among registered nurses from large hospitals in Brazil: a cross-sectional study. BMC Health Serv. Res. 2017; 17(1):21.
9. Albougami AS, Almazan JU, Cruz JP, Alquwez N, Alamri MS, Adolfo CA, et al. Factors affecting nurses' intention to leave their current jobs in Saudi Arabia. Int. J. Health Sci (Qassim). 2020; 14(3):33-40.
10. Kim I-J, Shim H-W. Subjectivity About Turnover Intention Among Male Nurses in South Korea: A Q-Methodological Study. Asian Nurs. Res. 2018; 12(2):113-20.
11. Kluczyńska U. Motives for choosing and resigning from nursing by men and the definition of masculinity: a qualitative study. J. Adv. Nurs. 2017;73(6):1366-76.
12. Shah M, Parpio Y, Zeb A. Perceptions of male nurses about nursing profession. Biomed. J Sci. Tech. Res. 2017;1(4):1206-8.
13. Gunn V, Muntaner C, Ng E, Villeneuve M, Gea-Sanchez M, Chung H. Gender equality policies, nursing professionalization, and the nursing workforce: A cross-sectional, time-series analysis of 22 countries, 2000-2015. Int. J. Nurs. Stud. 2019; 99:103388.
14. O'Lynn CE. Gender-based barriers for male students in nursing education programs: prevalence and perceived importance. J. Nurs. Educ. 2004; 43(5):229-36.
15. Sullivan GM, Artino AR. Analyzing and interpreting data from Likert-type scales. J. Grad. Med. Educ. 2013; 5(4):541-2.
16. Spahr N. Perceptions of Recent Male Nursing Graduates Regarding Gender Bias and Gender-Based Educational Barriers: Walden University; 2012.
17. Finnegan MW. Male Nurses' Experience of Gender Stereotyping Over the Past Five Decades: A Narrative Approach: The Barbara H. Hagan School of Nursing; 2019.
18. Yilmaz FA, Polat S. Male Nurses' Views on the Implementation of the Obstetrics Gynecology Nursing Course. Int J. Caring Sci. 2020; 13(1):359.
19. Al-Momani MM. Difficulties Encountered by Final-Year Male Nursing Students in Their Internship Programmes. Malays J. Med. Sci. 2017; 24(4):30-8.
20. Jaberi A, Momennasab M. Effectiveness of standardized patient in abdominal physical examination education: a randomized, Controlled Trial. Clin. Med. Res. 2019; 17(1-2):1-10.
21. Karaca A, Durna Z. Patient satisfaction with the quality of nursing care. Nurs. Open. 2019; 6(2):535-45.
22. Mitra JML. Perceptions of Male Nursing Students About Working in Women's Health: East Tennessee State University; 2017.
23. Azizi S, Jafari S, Ebrahimian A. Shortage of men nurses in the hospitals in Iran and the world: A narrative review. Sci. J. Nurs. Midwifery Paramed. Fac. 2019; 5(1):6-23.
24. Abrahamsen B, Storvik A. Nursing students' career expectations: Gender differences and supply side explanations. J. Nurs. Res. Pract. 2019; 3:16.
25. Powers K, Herron EK, Sheeler C, Sain A. The lived experience of being a male nursing student: Implications for student retention and success. J. Prof. Nurs. 2018; 34(6):475-82.
26. Tedesco-Schneck M. Classroom Participation: A Model of Feminist Pedagogy. Nurse Educ. 2018; 43(5):267-75.
27. Barlow K. Gendered Experiences of Nursing Job Demands and Resources: Bowling Green State University; 2020.
28. Mao A, Cheong PL, Van IK, Tam HL. "I am called girl, but that doesn't matter"-perspectives of male nurses regarding gender-related advantages and disadvantages in professional development. BMC Nurs. 2021; 20(1):24.
29. Davidson R. Female faculty and senior male student perceptions of gender bias in nursing education: Capella University; 2014
30. Research W. Male participation in nursing and allied health higher education courses. Office for Students, Bristol, England, 2020.

The effect of Teach-back method education on the control of asthma and family care pressure of patients in Iran

Mohammad Imanipour[1,6]
https://orcid.org/0000-0002-1526-2893
Zahra Molazem[2,6]
https://orcid.org/0000-0003-0169-6161
Mahnaz Rakhshan[3,6]
https://orcid.org/0000-0003-1687-5154
Mohammad Javad Fallahi[4,6]
https://orcid.org/0000-0002-8562-5637
Amir Mohammad Atashin Sadaf[5]
https://orcid.org/0000-0001-9486-0332

Original article

The effect of Teach-back method education on the control of asthma and family care pressure of patients in Iran

Abstract

Objective. To investigate the effect of teach-back education on patient asthma control and family care pressure of patients with asthma. **Methods.** The present study is a clinical trial and the study population was patients referred to Shahid Faghihi and Shahid Motahhari clinics in Shiraz, Iran. 58 patients with asthma and their caregivers were randomly assigned to the intervention and control groups, for a total of 29 subjects in each group. In the intervention group: the teach-back method was delivered individually to the patient and his or her primary caregiver in three sessions of approximately 60 minutes at one-day intervals. each session included presentations, practical techniques and a booklet. In this study, patients and caregivers in the control group were not trained. Before the intervention, 4 and 8 weeks after the intervention, asthma control test and spirometry test were performed

1 Student Research Committee.
Email: mohammad.imani2014@gmail.com.
2 Professor of Nursing.
Email: molazem@sums.ac.ir. Corresponding author.
3 Associate Professor of Nursing.
Email: rakhshanm@sums.ac.ir
4 Assistant Professor of Medicine.
Email: fallahimj@sums.ac.ir
5 M.Sc Student in Medical Surgical Nursing. Zanjan University of Medical Sciences, Zanjan, Iran.
Email: atashinsadaf.1995@gmail.com
6 Shiraz University of Medical Sciences, Shiraz, Iran.

Conflicts of interest: None.
Receipt: May 31, 2021.
Approved: March 2, 2022.
How to cite this article: Alsadat Hosseini F, Parvan K, Shaygan M, Thomson B. Male Nursing Students' Perception of Gender Barriers in Nursing Curricula in an Iranian University. Invest. Educ. Enferm. 2022; 40(1):e04.
DOI: https://doi.org/10.17533/udea.iee.v40n1e04.

Investigación y Educación en
Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

to evaluate asthma control; Also, before the intervention and 8 weeks after the intervention, Zarit test was performed to evaluate the care burden. **Results.** The findings of repeated measures tests showed that, compared to the control group, the intervention group obtained a greater increase in the vital capacity index ($p=0.028$) and in the disease control score ($p=0.001$), as well as a reduction in the burden of care on family members ($p<0.001$). **Conclusion.** The present study showed that teaching asthma related topics to the patient and her caregiver along with the follow-up and supervision of the nurse improves the asthma control of the patient and also reduces the caregiver pressure.

Descriptors: asthma; teach-back communication; caregiver burden.

El efecto de la educación del método Teach-back en el control del asma y la carga del cuidado familiar de los pacientes en Irán

Resumen

Objetivo. Investigar el efecto de la educación con el método teach-back sobre el control del asma y la carga del cuidado familiar de estos pacientes. **Métodos.** Ensayo clínico cuya población de estudio fueron los pacientes remitidos a las clínicas Shahid Faghihi y Shahid Motahhari en Shiraz, Irán. Se asignaron aleatoriamente 58 pacientes con asma y sus cuidadores a los grupos de intervención y control, con un total de 29 díadas en cada grupo. Las personas del grupo de intervención recibieron formación con el método teach-back que se impartió individualmente al paciente y a su cuidador principal en tres sesiones de aproximadamente 60 minutos en tres días consecutivos. Cada sesión incluía presentaciones, técnicas prácticas y un folleto. Los pacientes y cuidadores del grupo de control no recibieron formación. Antes de la intervención y a las 4 y 8 semanas después de la misma, se aplicaron las escalas de control del asma y la de Zarit para evaluación de la carga del cuidado y, además se practicó una espirometría. **Resultados.** Las pruebas de medidas repetidas entre los grupos de estudio mostraron que, comparando con el grupo control, el grupo de intervención obtuvo mayor aumento del índice de capacidad vital ($p=0.028$) y del puntaje de control de la enfermedad ($p=0.001$), además, se redujo la carga del cuidado en los familiares ($p<0.001$). **Conclusión.** El presente estudio mostró que con la enseñanza de temas relacionados con el asma al paciente y a su cuidador, junto con el seguimiento y la supervisión de la enfermera, se mejora el control del asma en el paciente y también se reduce la carga del cuidador.

Descriptores: asma; método teach-back; carga del cuidado.

O efeito da educação do método Teach-back no controle da asma e a carga do cuidado familiar dos pacientes no Irã

Resumo

Objetivo. Investigar o efeito da educação com o método teach-back sobre o controle da asma e a carga do cuidado familiar destes pacientes. **Métodos.** Ensaio clínico no qual a população de estudo foram os pacientes enviados às clínicas Shahid Faghihi e Shahid Motahhari em Shiraz, Irã. 58 pacientes com asma e seus cuidadores foram designados aleatoriamente aos grupos de intervenção e controle, com um total de 29 díade em cada grupo. As pessoas do grupo da intervenção receberam formação com o método teach-back que se transmitiu individualmente ao paciente e ao seu cuidador principal em três sessões de aproximadamente 60 minutos em três dias consecutivos. Cada sessão incluía apresentações, técnicas práticas e um folheto. Os pacientes e cuidadores do grupo de controle não receberam formação. Antes da intervenção e às 4 e 8 semanas depois dela, se aplicaram as escalas de controle da asma e a de Zarit para avaliação da carga do cuidado e, além disso se praticou uma espirometria. **Resultados.** As provas de medidas repetidas entre os grupos de estudo mostraram que, comparando com o grupo de controle, o grupo de intervenção obteve maior aumento do índice de capacidade vital ($p=0.028$) e da pontuação de controle da doença ($p=0.001$), ademais de que se reduziu a carga do cuidado nos familiares ($p<0.001$). **Conclusão.** O presente estudo mostrou que o ensino de temas relacionados com a asma ao paciente e ao seu cuidador, junto com o seguimento e a supervisão da enfermeira, se melhora o controle da asma no paciente e também se reduz a carga do cuidador.

Descritores: asma; comunicação para apreensão de informação; fardo do cuidador.

Introduction

Today, chronic diseases are recognized as the most important health problem, especially in developing countries. Asthma is a common chronic inflammatory disease of the respiratory tract characterized by a variety of symptoms, including airway obstruction and bronchitis. Asthma is currently considered as one of the most serious health problems.(1,2) In a 2014 report on the global prevalence of asthma states that there are approximately 300 million people with asthma worldwide and that it is expected to increase by about 33% to 20 million until the year 2025.(3) Also, the prevalence of asthma and chronic bronchitis in Iran has been reported from 4.8 to 5.6%.(4)

Quality of life is considered as an important criterion for studying chronic diseases. This means feeling good in physical, mental and social aspects. Accordingly, quality of life is used to assess community health needs, assess the social impact of the disease, identify at-risk individuals, implement appropriate health policies, and allocate health resources. Because asthma is a chronic disease with a high cost of treatment; it is difficult to manage, as a result, it reduces the quality of life of patients and their families.(5,6) Despite many recommendations about the role of disease prevention and control through education of correct behaviors, many studies still acknowledge that the disease is slow and difficult to control. This disease is not curable, but with a series of treatment and care measures, it can be controlled to some extent.(7,8)

Educating patients increases their understanding of the disease, treatment, and can have positive effects on the patient's performance, physical condition, quality of life, adaptation, and reduction of emotional problems.(9) One of the most effective methods to improve the understanding of education is the teach-back method. This method is a comprehensive, multidisciplinary, evidence-based strategy used to understand and retain information. Health care organizations have endorsed this approach as an effective way to ensure that health care information is understood and reduce the risk of patients misunderstanding essential information in clinical situations.(10,11) In the teach-back method, essential information is explained to the patient in a way that the patient understands and is an educational method to ensure patients' understanding. The purpose of the feedback method is to provide effective learning at the patient literacy level. The advantages of using this method are improving the patient's relationship with the treatment staff, increasing patient safety, better evaluation of the educator from the patient, and usability in people with low literacy levels.(12,13) Therefore, the aim of this study was to investigate the effect of teach-back education on patient asthma control and family care pressure of patients with asthma referred to clinics affiliated to Shiraz University of Medical Sciences, Shiraz, Iran. Accordingly, if the intervention performed in this study is effective, its results can be used as an effective way to increase the quality of life and improve asthma control of patients and reduce the stress of caring for their families.

Methodology

The present study is a clinical trial and the study population was patients referred to Shahid Faghihi and Shahid Motahhari clinics in Shiraz, Iran, who referred to the pulmonary ward in the year 2020. Overall, 58 patients with asthma who had the condition participated in the study.

Patients, inclusion, and exclusion criteria. The number of patiets in each group was 29 patients and 29 primary caregivers. Research units were selected by the available sampling method. Then they were assigned to two groups by random assignment. Additionally, inclusion criteria for patients included: moderate to severe asthma (Based on the doctor's opinion), age range 18 to 60 years, willingness to participate in research and fill out informed consent form, not participating in similar programs during the last 6 months, having the ability to understand based on the researcher's judgment, and the possibility of making telephone calls. On the contrary, exclusion criteria also included; absenteeism in educational classes, impossibility to continue cooperation, having a degree in medical sciences and suffering from other chronic diseases. Inclusion criteria for the patient's primary caregiver include: willingness to participate in research and filling out informed consent form, not participating in similar programs during the last 6 months, having the ability to understand based on the researcher's judgment, not caring for other chronic conditions, possibility Making phone calls and not having a critical or stressful event (such as death of relatives, divorce, illness, or immigration in the last three months). Furthermore, absenteeism in educational classes, the impossibility of continuing cooperation in the study, and having education in the medical sciences group were the exclusion criteria for the main caregiver.

Sample size. Based on the study of York *et al*.,(1) the sample size in this study (*n*=58) also using NCSS software using the mean difference formula between the two groups considering α=0.05, power 80%, mean and standard deviation of group one (0.62 ± 0.05), the mean and standard deviation of group two (0.66 ± 0.05) was determined by considering a drop of 20% in each group:

$$N = \frac{(1.96+0.84)^2(0.05^2+0.05^2)}{(0\ 66-0\ 62)^2}$$

$$N = \frac{\left(Z_{1-\alpha/2}+Z_{1-\beta}\right)^2({S_1}^2+{S_2}^2)}{(\bar{X}_1-\bar{X}_2)^2}$$

Data collection tools. Data collection tools included patient demographic information questionnaire, demographic information questionnaire of the main caregiver, asthma control test, lung function test (Spirometry), and ZARIT care pressure questionnaire.

Asthma control test and lung function test (Spirometry). To evaluate the asthma control of patients, asthma control test and lung function test (Spirometry) were used at intervals before the start of the study, 4 and 8 weeks after the intervention. The asthma control test is based on GINA institute criteria and allows patients older than 12 years to assess their asthma control status over 4 weeks.(2) The reliability of asthma control test in various studies has been reported equal to 0.94 and its validity has been confirmed based on the correlations between asthma control test and other tools for measuring asthma recovery status.(3) In the asthma control test, a score of 5 indicates the best position and a score of 1 indicates the worst position of asthma control. The recorded scores were added together to obtain the total score. The total score was used to assess asthma control status includes score 25 (asthma has been completely under control for the past 4 weeks), score 20 to 24 (asthma has been under control for the past 4 weeks), and score 19 or less (has not been controlled in the last 4 weeks).

Lung function test is performed by a specialist technician using ZAN Spirometry device (Germany) in accordance with the principles related to this test. In this study, indicators such as Forced Expiratory Volume in first second (FEV1), Forced Vital Capacity (FVC), FEV1 / FVC ratio and Forced Expiratory Flow rate %25 - %75 (FEF25 -75%) were measured.

Assess the quality of life of patients. To assess the quality of life of patients, the 67-item questionnaire of Marx *et al.* was used at intervals before and 8 weeks after the intervention. This questionnaire measures quality of life in 5 dimensions: respiratory function, physical activity, mood function, social function and general perception of health. The answer to each question was scored on a 5 degree Likert scale. In this questionnaire, increasing the total score indicates an improvement in the quality of life. Each question has a number of qualitative answers including: ever, rarely, sometimes, most and always. The score of each positive question is between 1 and 5. The option "always" has a score of 5 and the option "never" has a score of 1. In the negative questions, the option "always" has a score of 1 and the option "never" has a score of 5. Responses to each scale were reported to be rated between 0-100 on average. The validity of this questionnaire in terms of content validity has been confirmed by Marx *et al*. and has a Cronbach's alpha of 94%. Also, Cronbach's alpha of the subscales of this questionnaire has been reported in the range of 0.79 to 0.85.(4) Additionally, the validity of this questionnaire in Iranian society was assessed by Arab *et al.* (2012); The content validity index was 0.90 and in order to determine the internal reliability, the test-retest method was used and the correlation coefficient was 0.75.(5)

Assess the care burden of family caregivers. To assess the caregiver burden of family caregivers, the 22-item form of Zarit care burden questionnaire was used at intervals before and 8 weeks after the intervention. This questionnaire is about personal, social, emotional and economic pressures. Caregivers' responses for each statement were measured on a Likert scale with five options (never to always) that were scored from 0 to 4, respectively. In response to each question, the study units chose one of the cases never (zero score), rarely (score 1), sometimes (score 2), often (score 3) and always (score 4). Accordingly, the sum of the scores obtained varies from 0 to 88.(6) Accordingly, the scoring of care burden of family caregivers is as follows; score between 0-20 (low or no care pressure to family caregivers), score 21-40 (moderate care pressure to family caregivers), and score 41-88 shows the severe care pressure to family caregivers.

Training procedure. At first, the subjects were divided into intervention and control groups using random method and using 4 blocks. Before the intervention, patients' demographic information questionnaire, asthma control test and quality of life questionnaire for patients in the intervention and control groups, caregivers' demographic information questionnaire, Zarit care burden questionnaire for the intervention and control groups, and lung function test (Spirometry) were completed for patients and control groups. 4 weeks after the intervention, asthma control test was completed for the patients in the intervention and control groups and lung function test (Spirometry) was performed for them. 8 weeks after the intervention, asthma control test and quality of life questionnaire for patients and control groups were completed and lung function test (Spirometry) was performed for them. The Zarit care burden questionnaire was also completed for the caregivers of the intervention and control groups.

In this study, patients and caregivers of the control group were not trained. In the intervention group, according to the pre-determined training program, the return method training was provided individually to the patient and his primary caregiver in three sessions of approximately 60 minutes at intervals of one day. The training was presented face to face, in simple and understandable language, without using special medical terms, along with PowerPoint and practical techniques. At the end of the training sessions, a training booklet related to that session was presented to patients and caregivers. Before each session, the patient and caregiver's knowledge were asked about the content of each session, and after each training session, the patient and caregiver were asked questions again to assess the individual's learning. Accordingly, the correct answer to these questions at the end of each session was the basis for completing the training. The score of the return training was determined in such a way that if the patient answered 75% of the questions correctly, it would be considered as the effectiveness of the training and otherwise the training would continue. In order to provide more guidance and support in the intervals between sessions and during the 8-week follow-up period, the researcher answered the possible ambiguities of the intervention group by phone for about 10 minutes and in accordance with the needs of the patient and his caregiver.

Content of training sessions for patients and caregivers. The content of the sessions conducted by the researcher for patients and caregivers of the intervention group included the following: (i) First session: In this session, they were taught about asthma, disease triggers and allergens, familiarity with common medications and their side effects, and ways to prevent infections and asthma attacks; (ii) Second session: in the session, the were taught about proper breathing techniques and effective coughing, motivational dialogue to quit smoking and prevent smoking, diet and complementary nutrition, an exercise in asthma, and how to properly deal with acute conditions; and (iii) Third session: In this session, the use of asthma and nebulizer, familiarity with the peak flow meter device and how to use it were taught. Also, patients were evaluated for the correct performance of the taught techniques and the contents of previous sessions.

Statistical analysis. Data were evaluated using SPSS v.19 software and the final analysis was performed on 58 patients and caregivers. Mean and standard deviation were used to describe the data. Furthermore, the frequency and percentage were used to describe the qualitative data. To comparison between the two groups, in case of parametric assumptions, the T-test of two independent samples was used and in case of no assumptions, Mann-Whitney test was used. Dependent t-pair test was used to evaluate the intra-group comparison and Wilcoxon nonparametric test was used if the hypotheses were not met. Repeated analysis test was used to compare more than two groups if parametric assumptions were made and Friedman test was used if no assumptions were made. The relationship between qualitative variables was also assessed by Chi-square test (Significance level was considered 0.05 for all tests).

Results

Table 1 shows that the only variables studied in which statistically significant differences were found were sex and other diseases, which had higher proportions in the intervention group than in the control group.

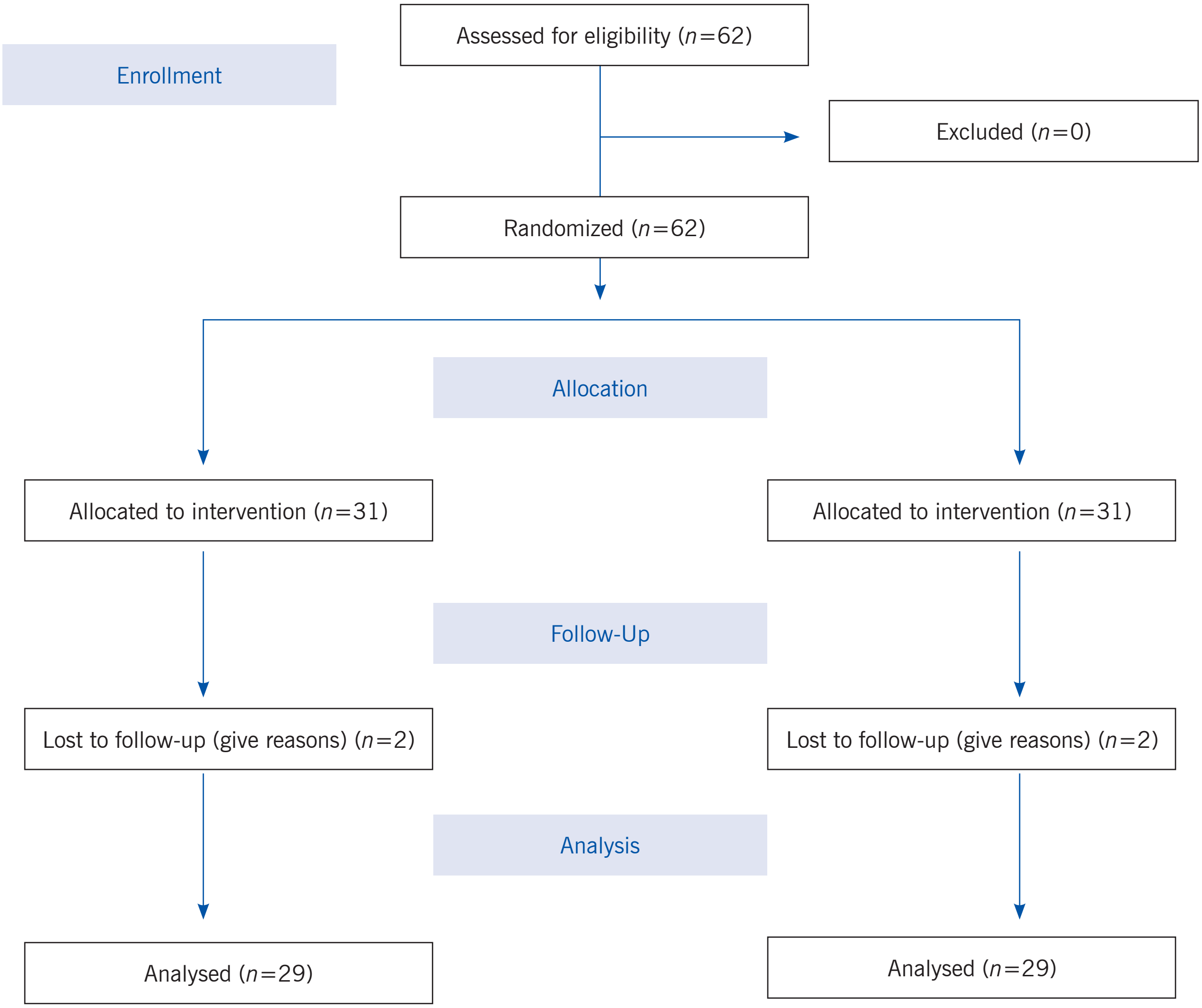

Assessed for eligibility (n=62)
Enrollment
Excluded (n=0)
Randomized (n=62)
Allocation
Allocated to intervention (n=31)
Allocated to intervention (n=31)
Follow-Up
Lost to follow-up (give reasons) (n=2)
Lost to follow-up (give reasons) (n=2)
Analysis
Analysed (n=29)
Analysed (n=29)

Table. 1. Frequency distribution of demographic variables of the studied units in the control and intervention groups

Groups		Intervention		Control		*p*-value
Variable		Number	Percentage	Number	Percentage	
Age	18-30	1	3.4	0	0.0	0.132
	31-40	7	24.1	7	24.1	
	41-50	5	17.2	11	37.9	
	51-60	14	48.3	11	37.9	
Sex	Male	3	10.3	13	44.8	0.003
	Female	26	89.7	16	55.2	
Level of education	Illiteratee	5	17.2	1	3.4	0.060
	Primary	6	20.7	10	34.5	
	Lower than diploma	3	10.3	9	31.0	
	Diploma	9	31.0	6	20.7	
	Bachelor	6	20.7	2	6.9	
	Upper than bachelor	0	0.0	1	3.4	
Marital status	Single	3	10.3	1	3.4	0.106
	Married	20	69.0	27	93.1	
	Divorced	3	10.3	0	0.0	
	The wife died	3	10.3	1	3.4	
Employment status	Employee	1	3.4	3	10.3	0.140
	Farmer	0	0.0	1	3.4	
	Free	1	3.4	6	20.7	
	housewife	20	69.0	11	37.9	
	Unemployed	1	3.4	1	3.4	
	Worker	1	3.4	2	6.9	
	Retired	5	17.2	5	17.2	

Table. 1. Frequency distribution of demographic variables of the studied units in the control and intervention groups. (Cont.)

Groups		Intervention		Control		*p*-value
Variable		Number	Percentage	Number	Percentage	
Income level	Less than 30 dollar	8	27.6	9	31.0	0.892
	Between 30-60 dollar	14	48.3	12	41.4	
	More than 60 dollar	7	24.1	8	27.6	
Having health insurance	Yes	28	96.6	28	96.6	0.754
	No	1	3.4	1	3.4	
Habitat	City	28	96.6	27	93.1	0.079
	Village	8	27.6	2	6.9	
Another diseases	Yes	18	62.1	9	31.0	0.034
	No	11	37.9	20	69.0	

Comparison of the mean score of asthma control test in control and intervention groups

Based on the results of repeated measures test, the mean score of asthma control test was different. The trend of changes in the mean score of asthma control test in the intervention group (before intervention =14.37±4.24, 4 weeks after intervention = 17.34±4.02, 8 weeks after intervention =20.03±3.51) more than the control group (before intervention = 14.86±3.80, 4 weeks after the intervention = 13.41±3.69, 8 weeks after the intervention = 13.03±3.64 which indicates the effect of the intervention on this group (p = 0.001), the asthma control score was statistically significant between the intervention and control groups (p <0.05); but the time and time/group variables showed no significant effect on asthma control score. In other words, time had no effect on asthma control test.

Comparison of mean scores of Spirometry indices in intervention and control groups

According to Table 2, in comparing the mean scores of Spirometry indices between the intervention and control groups before, 4 weeks after and 8 weeks after the intervention, it was found that 8 weeks after the intervention in the mandatory vital capacity index, there was a statistical difference between the control and intervention There was significance (p = 0.028). Regarding Spirometry FEV1 index, 8 weeks after the, there was a statistically significant difference between the control group and the intervention (p = 0.022). Regarding Spirometry FEV1/FVC index, 8 weeks after the intervention, there was a statistically significant difference between the control and intervention groups (p = 0.019). According the Spirometry FEF 25-75% index in 8 weeks after intervention, there was a statistically significant difference between control and intervention (p =0.023).

Table. 2. Comparison of mean scores of Spirometry indices by moment and groups

Spirometry	Moment	Intervention		Control		p-value
		Mean	SD	Mean	SD	
FVC	Before intervention	75.89	22.52	81.34	22.63	0.428
	4 weeks after the intervention	89.79	22.12	83.55	20.32	0.268
	8 weeks after the intervention	90.89	20.60	79.27	18.46	0.028
FEV1	Before intervention	66.13	22.53	74.93	23.69	0.189
	4 weeks after the intervention	80.44	20.90	74.17	22.76	0.279
	8 weeks after the intervention	85.51	21.03	70.62	22.78	0.022
FEV1/FVC	Before intervention	72.68	12.71	75.68	12.31	0.319
	4 weeks after the intervention	75.96	12.71	72.06	14.87	0.312
	8 weeks after the intervention	80.37	13.99	72	12.59	0.019
FEF 25-75%	Before intervention	48.82	31.77	61.10	35.20	0.124
	4 weeks after the intervention	57.75	29.92	58.3	32.30	0.973
	8 weeks after the intervention	67.31	28.92	49.58	28.82	0.023

Frequency distribution of demographic variables of patients' primary caregiver

Using Chi-square and Fisher tests, it was shown that the two groups of control and intervention did not have a statistically significant difference with each other in terms of age and sex ($p> 0.05$). In addition, there was no statistically significant difference between the two groups of control and intervention in terms of variables of education level, marital status, patient relationship and chronic diseases ($p> 0.05$) (Table 3).

Table 3. Demographic variables of patients' primary caregiver

Groups		Intervention		Control		p-value
Variable		Percentage	Number	Percentage	Number	
Age	Less than 20	10.3	3	10.3	3	0.91
	20-30	13.8	4	13.8	4	
	31-40	17.3	5	20.18	6	
	41-50	13.8	4	20.18	6	
	51-60	27.6	8	27.6	8	
	61-70	13.8	4	3.4	1	
	More than 70	3.4	1	3.4	1	
Sex	Male	48.3	14	48.3	14	0.793
	Female	51.7	15	51.7	15	
Level of education	illiterate	10.3	3	10.3	3	0.955
	Lower than diploma	44.8	13	48.3	14	
	Diploma	27.6	8	31.1	9	
	College education	17.3	5	10.3	3	
Marital status	Single	17.2	5	13.8	4	0.219
	Married	69	20	86.2	25	
	Divorced	6.9	2	0	0	
	The wife died	6.9	2	0	0	
Relationship with the patient	Father	10.3	3	3.4	1	0.260
	Mother	0	0	3.4	1	
	Wife	51.7	15	72.5	21	
	Sister	3.4	1	3.4	1	
	Brother	0	0	0	0	
	Child	34.6	10	17.3	5	
Chronic diseases	Yes	24.1	7	31	9	0.770
	No	75.9	22	69	20	

Comparison of mean scores of care stress in control and intervention groups

Mann-Whitney test was used to compare pre-intervention care pressure in the two groups due to non-normality of data. According to the results, there was no statistically significant difference between the two groups in terms of mean score of care pressure (mean care pressure of the control group= 35.24±10.73 and the intervention group = 35.51±11.31; p = 0.75). To compare the care pressure 8 weeks after the intervention in the two groups, due to the normal distribution of data, t-test was used and the results showed that there was a statistically significant difference between the two groups in terms of mean care pressure score (The mean care pressure of the control group = 35.72±9.63 and 18 ±6.61 in the intervention group ($p<0.001$). In other words, the Tech-back training method has reduced the care pressure in the caregivers of the intervention group.

Discussion

Today, no one doubts the need for disease prevention to take precedence over treatment, because any disease, in addition to the suffering it imposes, requires a high cost to cure it, which affects both the individual and the community, as a result, it can be helpful to teach disease-related content in a way that stays in the mind for a long time and promotes better interaction between the patient and the nurse. Although some diseases, such as asthma, are not curable, they can be controlled. In this study, we used the Teach-back education method for patients with asthma and measured its effect on patients' asthma control and family care pressure in patients with asthma.

Based on the results, in comparing the mean scores of asthma control test in the control and intervention groups, it was found that the mean scores of asthma control test in the control group, before, 4 weeks after and 8 weeks after the intervention were 14.86, 13.41, and 13.03 respectively. Accordingly, the results of the control group showed that their disease was not under control in all 3 time periods. On the contrary, our training method on the intervention group led to disease control in patients in this group. After 8 weeks, the patients in the intervention group went from uncontrolled asthma to controlled asthma. Due to the significance of the group variable, there was a statistically significant difference between the intervention and control in terms of asthma control. In addition, the time and time / group variables showed no significant effect on asthma control score. These findings indicate the effectiveness of Teach-back education in controlling asthma.

Furthermore, in comparing the mean scores of Spirometry indices, it was found that the mean scores of all Spirometry indices in the intervention group were statistically significant and not the same. Also, the trend of changes in the mean of these scores showed that this educational method has a positive effect on patients and their Spirometry index has increased.

Shermans *et al*.(14) conducted a randomized controlled clinical trial with the aim of the effect of a 10-minute training session on patients' asthma control. In the intervention group, a 10-minute training including basic information about asthma and the effectiveness of medications was given. This training was not provided to the control group. The training session caused that after 3 months, asthma was significantly controlled in the intervention group compared to the control group. However, in the study of Arikan-Yildiz *et al*.(15) the scores of asthma control test were not significantly different in comparison before and after the intervention; which did not agree with the results of the study. The reasons for this difference in results include differences in the number of training program sessions (one hour training session), the age range of study participants (5-18 years), the manner of holding training sessions or the educational content presented in the sessions

In comparing the mean scores of caregiving stress in the two groups of control and intervention before and after the intervention, it was found that there was no statistically significant difference between the two groups in terms of mean scores of caregiving pressure before the intervention; But 8 weeks after the intervention, there was a statistically significant difference between the two groups in terms of mean care pressure score. Ghaneh *et al*.(16) conducted a study to determine the effect of supportive education program on the care pressure of family caregivers of patients undergoing hemodialysis. The results showed that the care pressure in the experimental group decreased after the intervention. According to the results of this study, it can be said that the use of educational-supportive programs can be effective in reducing the care pressure of family caregivers.

In conclusion, the results of the present study showed that teaching asthma related topics to the patient and her caregiver along with the follow-up and supervision of the nurse improves asthma control and also reduces the caregiver pressure. Additionally, this study also shows that the use of educational methods by asthmatics in a way that stays in the mind for a long time leads to an improvement in their condition. Nursing managers should inform staff about the importance and learning of these training methods by holding training courses. It is also suggested that more educational-therapeutic methods be used to cure diseases.

Acknowledgment. This paper was extracted from the MSc thesis of Mohammad Imanipour and was financially supported by Shiraz University of Medical Sciences, Iran (grant number, 97-01-08-19134). The authors thank patients and their families for participating in this study.

The sources of funding: Shiraz University of Medical Sciences, Iran (grant number, 97-01-08-19134).

References

1. Ramsey RR, Plevinsky JM, Kollin SR, Gibler RC, Guilbert TW, Hommel KA. Systematic review of digital interventions for pediatric asthma management. J. Allergy Clin. Immunology Pract. 2020; 8(4):1284-93.
2. Zervas E, Samitas K, Papaioannou AI, Bakakos P, Loukides S, Gaga M. An algorithmic approach for the treatment of severe uncontrolled asthma. ERJ Open Res. 2018; 4(1):00125-2017.
3. Chu LM, Pahwa P. Prevalence and associated factors for self-reported asthma in a Canadian population: The Canadian Community Health Survey, 2014. J. Asthma. 2018; 55(1):26-34.
4. Varmaghani M, Farzadfar F, Sharifi F, Rashidain A, Moin M, Moradi LM, et al. Prevalence of asthma, COPD, and chronic bronchitis in Iran: a systematic review and meta-analysis. Iran. J. Allergy Asthma Immunol. 2016; 15(2):93-104.
5. Chen H, Cisternas MG, Katz PP, Omachi TA, Trupin L, Yelin EH, et al. Evaluating quality of life in patients with asthma and rhinitis: English adaptation of the rhinasthma questionnaire. Ann. Allergy Asthma Immunol. 2011; 106(2):110-8.
6. Bompori E, Niakas D, Nakou I, Siamopoulou-Mavridou A, Tzoufi MS. Comparative study of the health-related quality of life of children with epilepsy and their parents. Epilepsy Behav. 2014; 41:11-7.
7. Rodrigues CD, Pereira RP, Dalcin PD. Effects of an outpatient education program in patients with uncontrolled asthma. J. Bras. Pneumol. 2013; 39(3):272-9.
8. Adeboye NO, Ajibode IA, Aako OL. On the Survival Assessment of Asthmatic Patients Using Parametric and Semi-Parametric Survival Models. Occup. Dis Environ Med. 2020; 8(2):50-63.
9. Alotaibi HS, Shivanandappa TB, Nagarethinam S. Contribution of community pharmacists in educating the asthma patients. Saudi Pharm. J. 2016; 24(6):685-8.

10. Bonner S, Zimmerman BJ, Evans D, Irigoyen M, Resnick D, Mellins RB. An individualized intervention to improve asthma management among urban Latino and African-American families. J. Asthma. 2002; 39(2):167-79.
11. Kornburger C, Gibson C, Sadowski S, Maletta K, Klingbeil C. Using "teach-back" to promote a safe transition from hospital to home: an evidence-based approach to improving the discharge process. J. Pediatr. Nurs. 2013; 28(3):282-91.
12. Dalir Z, Reihani Z, Mazlom R, Vakilian F. Effect of training based on teach back method on self-care in patients with Heart failure. J. Mazandaran Univ. Med Sci. 2016; 25(134):209-20.
13. Press VG, Arora VM, Shah LM, Lewis SL, Charbeneau J, Naureckas ET, Krishnan JA. Teaching the use of respiratory inhalers to hospitalized patients with asthma or COPD: a randomized trial. J. Gen. Intern. Med. 2012; 27(10):1317-25.
14. Schuermans D, Hanon S, Wauters I, Verbanck S, Vandevoorde J, Vanderhelst E. Impact of a single 10 min education session on asthma control as measured by ACT. Respir. Med. 2018; 143:14-7.
15. Arıkan-Ayyıldız Z, Işık S, Çağlayan-Sözmen Ş, Anal Ö, Karaman Ö, Uzuner N. Efficacy of asthma education program on asthma control in children with uncontrolled asthma. Turk. J. Pediatr. 2016; 58(4):383-8.
16. Ghane GO, Seyedfatemi N, Ashghali Farahani M, Hagani H. Effectiveness of supportive educative program on the burden in family caregivers of hemodialysis patients. J. Urmia Nurs. Midwifery Fac. 2017; 14(10):885-95.

Editorial

UNIVERSIDAD
DE ANTIOQUIA
1803

Infant stimulation reduces weight loss and increases breastfeeding: a randomized controlled trial

Lucy Marcela Vesga Gualdrón[1,4]
https://orcid.org/0000-0003-1575-1782
María Mercedes Durán de Villalobos[2,4]
https://orcid.org/0000-0003-3431-1264
Nancy Milena Bernal Camargo[3]
https://orcid.org/0000-0003-0902-8010

Infant stimulation reduces weight loss and increases breastfeeding: a randomized controlled trial

Abstract

Objective. The study aimed to measure the effect of auditory, tactile, visual, and vestibular (ATVV) stimulation therapy on sucking effectiveness (SE), infant-feeding mode, weight, height, and head circumference (HC) of full-term infants. Methods. A single-blinded randomized trial with a sample of 107 mother-child dyads. Inclusion criteria were healthy first-time mothers and full-term infants with no known pathological conditions, weighing between 2500 and 4000 grams, and recommendation of exclusive or predominant breastfeeding. The mothers in the experimental group (EG) received training in ATVV stimulation therapy and provided it from birth (first 24 hours of life) until the end of the follow-ups at week 5. The control group (CG) received only standard care that included education on warning signs and basic guidance on breastfeeding. SE, infant-feeding mode, and neonatal

1 RN, Ph.D. Assistant Professor. Email: lmvesgag@unal.edu.co
2 RN, Ph.D. Emeritus Professor. Email: mmvillobos@gmail.com
3 MD, Pediatrician. Assistant Professor, Faculty of Medicine, Fundación Universitaria de Ciencias de la Salud, Colombia.
4 Faculty of Nursing, Universidad Nacional de Colombia, Sede Bogotá (Colombia).

Conflicts of interest: None.

Receipt: May 31, 2021.

Approved: March 3, 2022.

How to cite this article: Vesga LM, Durán MM, Bernal NM. Infant stimulation reduces weight loss and increases breastfeeding: a randomized controlled trial. Invest. Educ. Enferm. 2022; 40(1):e05.

DOI: https://doi.org/10.17533/udea.iee.v40n1e05.

growth were measured at weeks 2 and 5. Results. In contrast to CG infants, the EG infants drank 2.02 cc more human milk in one minute of effective breastfeeding (p=0.002) at week 2 and 5.51 cc more at week 5 (p<0.0001). They showed greater adherence to breastfeeding at week 5 (p=0.025) and gained more weight: 8.35 grams/day (p=0.009) and 4.19 grams/day (p=0.008). HC did not differ between groups, and height difference was statistically significant at week 5 (p=0.025). **Conclusion.** ATVV stimulation therapy has a positive effect on neonatal health as it promotes effective sucking and exclusive breastfeeding, reduces weight loss, and improves neonatal growth.

Descriptors: breast feeding; physical stimulation; anthropometry; mother-child relations; infant, newborn; neonatal nursing.

La estimulación del neonato reduce la pérdida de peso y aumenta la lactancia materna: un ensayo controlado aleatorio

Resumen

Objetivos. Medir el efecto de la terapia de estimulación auditiva, táctil, visual y vestibular en la succión eficaz, el modo de alimentación, el peso, talla y perímetro cefálico de los neonatos a término. **Métodos.** Ensayo aleatorizado ciego, con una muestra de 107 díadas madre-hijo. Los criterios de inclusión fueron madres primerizas sanas y bebés a término sin condiciones patológicas conocidas, con peso entre 2500 y 4000 gramos e indicación de lactancia materna exclusiva o predominante. En el grupo experimental las madres recibieron entrenamiento en la terapia de estimulación auditiva, táctil, visual y vestibular y lo aplicaron desde el nacimiento (primeras 24 horas de vida) hasta el final del seguimiento. El grupo control recibió solamente la atención estándar que incluyó la educación sobre los signos de alarma y las indicaciones básicas sobre la lactancia materna. Se midió la eficacia de la succión, el tipo de alimentación y el crecimiento neonatal en la semana 2 y la semana 5. **Resultados.** Los bebés del grupo experimental comparados con el grupo control bebieron 2.02 cc más leche humana en un minuto de lactancia efectiva (p=0.002) en la segunda semana y 5.51 cc más en la quinta semana (p<0.0001); las madres registraron una mayor adherencia a la lactancia a las 5 semanas (p=0.025) y los bebés ganaron más peso: 8.35 gramos/día (p=0.009) y 4.19 gramos/día (p=0.008). El perímetro cefálico no presentó diferencias entre grupos, mientras que la diferencia en la talla fue estadísticamente significativa en la semana 5 (p=0.025). **Conclusión.** La terapia de estimulación auditiva, táctil, visual y vestibular tiene un efecto positivo en la salud neonatal, promueve la succión eficaz, la lactancia materna exclusiva, atenúa la pérdida de peso y mejora el crecimiento neonatal.

Descriptores: lactancia maternal; estimulación física; antropometría; relaciones madre-hijo; recién nacido; enfermería neonatal.

A estimulação do neonato reduz a perda de peso e aumenta a lactância materna: um ensaio controlado aleatório

Resumen

Objetivos. Medir o efeito da terapia de estimulação auditiva, táctil, visual e vestibular na sucção eficaz, o modo de alimentação, o peso, tamanho e perímetro cefálico dos neonatos a término. **Métodos.** Ensaio aleatório cego, com uma mostra de 107 díade mãe-filho. Os critérios de inclusão foram mães de primeira viagem saudáveis e bebês a término sem condições patológicas conhecidas, com peso entre 2500 e 4000 gramas e indicação de lactância materna exclusiva ou predominante. No grupo experimental as mães receberam treinamento na terapia de estimulação auditiva, táctil, visual e vestibular e a aplicaram desde o nascimento (primeiras 24 horas de vida) até o final do seguimento; o grupo de controle recebeu somente a atenção padrão que incluiu a educação sobre os sinais de alarme e as indicações básicas sobre a lactância materna. Se mediu a eficácia da sucção, o tipo de alimentação e o crescimento neonatal na 2ª semana e na 5ª semana. **Resultados.** Os bebês do grupo experimental comparados com o grupo de controle beberam 2.02 cc mais leite humana num minuto de lactância efetiva (p=0.002) na segunda semana e 5.51 cc mais na quinta semana (p<0.0001); as mães registraram uma maior aderência à lactância às 5 semanas (p=0.025) e os bebês ganharam mais peso: 8.35 gramas/dia (p=0.009) e 4.19 gramas/dia (p=0.008). O perímetro cefálico não apresentou diferenças entre grupos, enquanto a diferença no tamanho foi estatisticamente significativa na 5ª semana (p=0.025). **Conclusão.** A terapia de estimulação auditiva, táctil, visual e vestibular tem um efeito positivo na saúde neonatal, promove a sucção eficaz, a lactância materna exclusiva, atenua a perda de peso e melhora o crescimento neonatal.

Descritores: aleitamento materno; estimulação física; antropometria; relações mãe-filho; recém-nascido; enfermagem neonatal.

Introduction

Breast milk is the best food for newborns, yet there is low adherence to this feeding practice worldwide. In Colombia, 72.7% of newborns are breastfed, but only 36.1% of them continue to be breastfed at six months.(1) The breastfeeding cessation is influenced by several factors, including the experience of mothers who sometimes describe breastfeeding as difficult. This perception can be worse when they are young, first-time mothers, or have undergone cesarean section. Breastfeeding difficulties involve biological, psychological, and social factors(2) and occur in more than 70% of mothers during the first month of the child's life.(3) Some physical difficulties in newborns reported are a poor suck or latch to the breast and drowsiness.(4) In the mother, the perception of an insufficient supply of milk is one of the predictors of exclusive breastfeeding cessation or the initiation of breast milk substitutes.(1) This kind of perception is associated with lactogenesis II, where there is an inverse relationship between the time to secrete milk and the infant's effective sucking.(5) On average, lactogenesis II occurs 60 hours after birth but it may take longer. Primiparity is a risk factor strongly associated with delayed onset of lactogenesis II.(6) Therefore, it is very important to establish sucking effectiveness (SE) early, which is determined by the inter-suck breaks, the number of sucks, and the intraoral pressure.(7) SE is expressed in milliliters of breast milk taken per suckling, which increases spontaneously in the first 15 days of life to an average of 70 ml per feeding event. This volume depends on the intraoral pressure improvement;(8) if muscle strength increases, the number of sucks per burst and inter-suck breaks are reduced, and more milk is taken with less effort. Also, delayed lactogenesis II is associated with increased neonatal weight loss, insufficient weight gain, or jaundice. These after-effects often motivate health professionals to recommend breast milk substitutes to supplement infant feeding. Therefore, mothers should be able to stimulate effective sucking early to ensure optimal growth of the child.

Therapies such as the auditory, tactile, visual, and vestibular (ATVV) stimulation, proposed in the 1970s and modified in 1994,(9) have proven, throughout approximately three decades of research, to have favorable results in regulating behavioral states, the mother-child relationship, and the feeding behavior of preterm newborns who face great difficulty in regulating states of alertness due to prematurity.(10) The ATVV intervention has helped improve feeding progression, intraoral pressure, and the number of sucks in preterm infants,(11) and weight gain in full-term and preterm infants.(12) Therefore, these benefits can also be verified in full-term infants and produce positive results concerning the common breastfeeding difficulties experienced during the first month of life, a critical period that often defines breastfeeding success or failure. This is the first study in which mothers give ATVV therapy at home; previous studies have been conducted in hospitals or orphanages. Health professionals support breastfeeding initiation and maintenance; particularly, during counseling, they listen to mothers, help identify obstacles, and guide decision-making.(13) Nurses are in a privileged position to promote strategies that increase breastfeeding adherence. This study aims to measure the effect of ATVV stimulation therapy on breastfeeding (SE and infant-feeding mode), and neonatal growth (weight, height, and HC) of full-term infants.

Method

Design. This article shows a secondary analysis from a larger study on the effect of infant stimulation on adaptation to birth, (14) a single-blinded randomized controlled trial study with two groups —experimental group (EG) and control group (CG)— and random allocation. The EG mothers were trained in ATVV therapy following the adapted Rice's protocol(9) and received the standard care. The ATVV therapy involves using four sensory stimuli: auditory, with the mother's voice humming a lullaby; tactile, with a sequential massage from less sensitive body areas to those with more nerve receptors; visual, with permanent eye-to-eye contact during therapy; and vestibular, with a few minutes of rocking in the mother's arms. Previously trained mothers delivered the ATVV stimulation therapy twice a day, in the morning and at night, from the first 24 hours until the first two weeks after birth. From then on, the therapy was delivered once a day until the end of follow-ups. The CG mothers received standard care, which is education on warning signs, when to go back to the hospital, and basic recommendations on breastfeeding. A pediatrician, a research assistant, and two video analysts, blinded to group allocation, assessed SE, infant-feeding mode, and neonatal growth (weight, height, and HC). The data were taken at the Children's University Hospital of San José Bogotá D.C., from July to November 2016. Only the results on the physiological adaptive mode "nutrition" are presented here using the same sample size from the main study.

Sample. Inclusion criteria were first-time mothers with no illnesses and breastfeeding intention and healthy full-term infants weighing between 2500 and 4000 grams with exclusive or predominant breastfeeding recommendation. Exclusion criteria were mothers under 18 years of age, mothers diagnosed with mental illness or cognitive deficit, hospitalization of the mothers or newborns, and breastfeeding cessation. The sample size was calculated for two independent groups, estimating a type I error of 0.04, a type II error of 0.01, and two groups to be compared (K=2). With these parameters, a sample size of 120 mother-child dyads was calculated, and the dyads were allocated randomly to CG or EG using a table with random numbers. The sampling method was consecutive and stratified with an equal allocation according to the mode of birth (i.e., vaginal delivery or Cesarean section). The percentage of participants lost to follow-up was 10.8% despite the measures taken by the research team. For the last follow-up, participants' distribution was CG=53 and EG=54. To see the participant flow diagram, refer to the article entitled "Effect of infant stimulation on birth adjustment: a randomized trial."(14)

Measurement. The variables measured were suckling effectiveness (SE), infant-feeding mode, and neonatal growth (weight, height, and HC). Analysis of video recordings by two independent analysts and the test weighing method (weighing the infant before and after breastfeeding), which can estimate milk intake from the third day of life using well-calibrated scales,(15) were used to assess SE. The SE ratio was created measuring variables described in the literature.(7) *Total time per feeding* : Time in minutes that the newborn takes from latching to voluntarily releasing the nipple. *Inter-suck break*: Time the newborn rests between suck bursts > 1.5 seconds. *Number of sucks*: Number of times the newborn sucks on the mother's breast. *Suck burst*: A cluster of sucks, which differs from another by an inter-suck break. *Volume of breastmilk taken (cc)*: Difference in infant's weight before and after breastfeeding, considering that 1 gram of weight is equivalent to 1 cc of milk taken. The SE indicator was calculated as follows:

$$SE = \frac{Volume\ of\ breastmilk\ (cc)}{Time\ of\ Effective\ Suckling[TES]}$$

Where

TES=Total time per feeding-Intersuck breaks (minutes)

Infant-feeding mode. The feeding mode the baby was breastfed in the last 24 hours was assessed and classified as exclusive breastfeeding or predominant breastfeeding. In exclusive breastfeeding, the infants received only breast milk from their mother or a wet nurse or expressed breast milk, and no other liquids or solids except for drops or syrups consisting of vitamins, mineral supplements, or medicines. On the other hand, in predominant breastfeeding, the infants are fed mainly on breast milk; however, the infants may also receive water and water-based drinks (i.e., teas, infusions); fruit juice, and Oral Rehydration Salts (ORS) solution.(16)

Growth. Using anthropometric measurements, the variables weight, height, and HC were was determined. Daily weight gain: This is the difference between the current weight and the birth weight, divided by the number of days of life at the time of measurement; it is measured in grams per day (g/day). Height gain: This is the difference between the current height and the height at birth, divided by the number of days of life at the time of measurement. Head circumference gain: This is the difference between the current HC and the HC at birth, divided by the number of days of life at the time of measurement. Height and HC were measured in centimeters per day (cm/day). Confounding variables such as gestational age (GA), Apgar test score, and the baby's age at the time of assessment were measured. The GA was estimated using the New Ballard Score, and the Apgar score was determined using the Apgar test. Early initiation of breastfeeding is not a policy of the hospital. The data were obtained from participants' medical records.

Data collection. The medical records of potential participants were reviewed to verify that the inclusion criteria were met. The dyads were recruited during the first 24 hours postpartum. The research was explained to the families, sociodemographic data was collected, and mothers' breastfeeding intention was asked. The mother-child dyads were randomly allocated to EG and CG, and EG mothers were trained in ATVV stimulation therapy according to the protocol. Resources were provided to perform the therapy at home and audio-visual tools were shared with the participants (see video created by Lucy Marcela Vesga and María Mercedes Durán entitled "Teaching early auditory, tactile, visual and vestibular (ATVV) stimulation" posted on YouTube on May 28, 2019 at https://www.youtube.com/watch?v=AEYg6UaOAV4 and the audio lesson created by the same authors entitled "Step-by-step instructions" posted on YouTube on October 24, 2019 at https://www.youtube.com/watch?v=H6iIib42uCs). Dates for follow-up meetings at the hospital were agreed on. Birth anthropometric measurements were obtained from medical records. A pediatrician and a research assistant who were unaware of the random allocation of the groups made face-to-face follow-ups at weeks 2 and 5 to the mother-infant dyads. For these follow-ups, the infant had to have been breastfed 2 hours before the appointment to equalize the satiety level and wear only one diaper for taking the anthropometric measurements. Breastfeeding was videotaped, and the end of it was considered when the baby spontaneously let go of the mother's breast, and she judged that the baby was finished. After breastfeeding, a research assistant weighed the infant wearing only a diaper on the same scale used for weighing the infant before the feeding. The mother was asked how she had breastfed the baby 24 hours earlier. Two video analysts followed a protocol to review each minute of the video recordings by sections, measuring criteria and optimizing the quality of the data obtained.

Data analysis. Data were analyzed using the SPSS 22.0 software. Concordance coefficients were used to ensure the quality of the data derived from the analysis of the video recordings. The data analysis followed two routes: one to compare between groups (CG and EG), and the other to compare within the groups at two different points in time (weeks 2 and 5). The effect size was calculated, and a linear regression model was created. The level of significance was set at $p < 0.05$.

Ethical issues. The study was approved by the hospital's research ethics committee (Approval 066 June 2016) and the university's research ethics committee (Approval 016-2016). Informed consents were signed by the mothers and by both parents approving the baby's participation. This study was registered at the Australian New Zealand Clinical Trials Registry (ANZCTR) with registration number ACTRN12617170000449336 on March 27, 2017.

Results

The analysis was performed with 107 mother-infant dyads (EG: 54 vs. CG: 53). Baseline data do not represent statistically significant differences between groups.

Table 1. Participants' baseline characteristics

Characteristics	Experimental Group (*n*=54)	Control Group (*n*=53)	*p*-value
Infants			
Gestational age (weeks); mean ± SD	38.9± 1.0	39±0.9	0.9*
Weight (g); mean ± SD	3077.3± 362.9	3152.7±361.4	0.3*
Height (cm); mean ± SD	50.7±1.8	50.3±1.4	0.2*
Head circumference (cm); mean ± SD	33.7±1.1	33.9±1.2	0.2*
Mothers			
Age (years); mean ± SD	25.2±6.2	24.3±4.2	0.9*
Occupation; *n* (%)			0.27**
Stay-at-home mom	18 (33.3)	15 (28.3)	
Employee	27 (50)	31 (58.4)	
Student	9 (16.6)	7(13.2)	
Breastfeeding intention; *n* (%)			0.062**
3 months	0 (0)	1 (1.8)	
6 months	3 (5.5)	6 (11.3)	
12 months	26 (48.1)	30 (56.6)	
>12 months	25 (46.2)	16(30.1)	

* Mann Whitney U test p-value; ** Chi-square test p-value

Effect of ATVV stimulation therapy on breastfeeding

Sucking Effectiveness (SE). Data quality was assessed by calculating Lin's Concordance Correlation Coefficient (CCC). It ranges from -1 to 1, with perfect agreement at 1 and good agreement when it is greater than 0.7.(17) Lin's CCC between the two analysts of the video recordings ranged from 0.903 to 0.996 for the first measurement of sucking parameters (number of sucks, number of bursts, inter-suck breaks), and it was 0.99 in all sucking parameters for the second measurement.

Table 2. Effect of ATVV on Sucking Parameters

Time / **Sucking Parameters**	**Week 2**			**Week 5**		
	Control Group ***Mean***	**Experimental Group** ***Mean***	**U Mann Whitney Test *p*-value**	**Control Group** ***Mean***	**Experimental Group** ***Mean***	**U Mann Whitney Test *p*-value**
Burst	79.31	73.12	0.393	81.28	75.75	0.305
Number of sucks per burst	9.47	10.15	0.282	9.87	9.71	0.486
Time of Effective Sucking (minutes)	9.35	9.02	0.715	9.94	8.94	0.152
Total time per feeding (minutes)	21.7	19	0.139	20.2	19.5	0.318

Table 3 shows the description of SE. There are no statistically significant differences between the EG and the CG. However, the results support the theory that ATVV stimulation promotes sucking development since there is a lower number of bursts, a higher number of sucks per burst, and a shorter sucking time in the EG than in the CG. This is a clinically meaningful result even though it is not statistically significant. These findings suggest that ATVV stimulation may increase muscle strength during sucking (not measured in this study), which allows for greater milk expression per minute. When comparing between groups the amount of breast milk expressed at week 2, it is observed that EG babies manage to express 2.02cc/TES more than CG babies (EG: 7.19 cc / TES vs. CG: 5.17 cc/TES, Mann-Whitney U-test $p=0.002$). At week 5, EG babies got 5.51 cc/TES more than CG babies (EG: 14.19 cc/TES vs. CG: 8.67 cc/TES, Mann-Whitney U-test $p=0.002$).

In the analysis of related samples, the Wilcoxon sign test showed statistically significant differences in both groups considering that time matures neonatal sucking ability. However, the benefits of ATVV stimulation are not unimportant, as seen in the regression model. A linear regression model was used and had an R-Squared of 0.336. Transformation of the dependent variable (SE) was necessary using the natural logarithm function to normalize the data distribution, a transformation that was verified using the Kolmogorov Smirnov test ($p=0.200$). Assessing the overall relevance of the model, its value $p<0.001$ allows us to affirm that the joint presence of the variables is relevant and, therefore, individual analysis of them is pertinent. In this sense, belonging to the EG and being a girl increase the natural logarithm of SE, while predominant breastfeeding decreases it. SE at week 2, weight gain, and neonatal age *directly correlate with SE at week 5*. These results confirm the importance of stimulating effective sucking early, as it can influence the feeding process in the long term; the use of breast milk substitutes can hinder SE. Other variables such as mode of birth, GA, birth weight, Apgar test score, use of epidural analgesia, or breastfeeding intention were removed from the model because they were not statistically significant (Table 3).

Table 3. Linear Regression Model for Sucking Effectiveness (SE) at Week 5

Model	Non-standardized coefficients		Standardized coefficients	*t*	*p*-value
	B	Standard error	Beta		
Constant term	1.546	0.820		1.886	0.062
Comparison group	0.356	0.133	0.234	2.679	0.009
Sex	0.256	0.131	0.168	1.954	0.054
Weight gain	0.025	0.009	0.265	2.824	0.006
Infant-feeding mode	-0.282	0.168	-0.147	-1.683	0.095
Sucking effectiveness at week 2	0.031	0.016	0.172	1.874	0.064
Infant's age	-0.017	0.022	-0.066	-0.789	0.432

Infant-feeding mode

Regarding the feeding mode, a higher frequency of exclusive breastfeeding was observed in the EG dyads, a difference that is only statistically significant at the follow-up measurement at week 5. The achievement of effective sucking in the EG infants possibly improved mothers' confidence in their ability to breastfeed, and for this reason, they return to exclusive breastfeeding (Table 4).

Table 4. Effect of ATVV on Infant-feeding Mode

Infant-feeding mode by follow-up measurement	Group		Chi-square *p*-value
	Control (*n*=53)	Experimental (*n*=54)	
Week 2			
Exclusive breastfeeding	41(77.3)	47(87)	0.19
Predominant breastfeeding	12 (22.7)	7(13)	
Week 5			
Exclusive breastfeeding	38(71.7)	48 (88.9)	0.025
Predominant breastfeeding	15 (28.3)	6 (11.1)	

Effect of ATVV on infants' growth

Weight, height, and HC variables were age-adjusted during statistical analysis to control bias. Table 5 shows a weight gain of 8.35 g/day in the EG at week 2 (Cohen's d = 0.54) compared to the CG. It is observed that weight loss slows down as compared to the CG. Meanwhile, at week 5, the difference between the groups is 4.19 g/day (Cohen's d = 0.53), which suggests a dose-dependent effect of ATVV therapy.

Table 5. Effect of ATVV on infants' growth

Variable	Group		Difference	Cohen's d	Mann-Whitney U *p*-value
	Control (*n*=53)	Experimental (*n*=54)			
Weight (g/day); mean					
Week 2	4.34	12.69	8.35	0.54	0.009
Week 5	29.10	33.29	4.19	0.53	0.008
Height (cm/day); mean					
Week 2	0.08	0.10	0.02	0.3	0.337
Week 5	0.08	0.11	0.03	0.4	0.025
Head circumference (cm/day); mean					
Week 2	0.12	0.10	0.02	0.3	0.515
Week 5	0.086	0.10	0.014	0.78	0.041

Discussion

No research on SE was found in full-term infants, though four studies evaluating SE in preterm infants were found. In these studies, babies had 23 to 33 weeks of GA, received 1 to 3 sessions of ATVV therapy, and researchers measured variables such as the transition from tube to oral feeding, time from the start to the end of the feeding, and milk-intake. Regarding oral feeding achievement, there are studies that did not prove the effectiveness of ATVV therapy(11,12) and studies that found a 4-day advantage of EG infants in achieving complete oral feeding, a difference statistically significant,(18,19) and increased oral intake during the first ten days of ATTV therapy(18) In our study, EG babies expressed more breast milk in both follow-up measurements than CG babies, and this difference was statistically significant. Compared to the number of sucks, these studies showed statistically significant differences between the groups, before and after the intervention; however this effect disappears when an analysis of variance is performed.(18)

The same occurs with the amount of milk taken and the time spent in feeding. These studies found sucking differences between the groups at 7 days post-intervention, which were a greater number of sucks, a greater number of sucks per burst, and a greater sucking pressure of preterm infants in the EG. These differences disappeared after 14 days of therapy. In our study, a difference not statistically significant was observed. Medoff-Cooper et al.(11) interpreted such results as the effect of neurological maturation and evolution of the infants and suggested that ATTV stimulation therapy may favor the earlier achievement of neurobehavioral organization and, thus, sucking maturity.(12)

Regarding the infant-feeding mode, no known studies precede this study and show the effect of ATVV therapy. One explanation we propose for this effect is that, by improving SE more quickly, lactogenesis II is accelerated;(5) this may increase the mother's confidence in her ability to breastfeed (6,20) and control the weight loss. In terms of the effect of ATVV therapy on weight gain, some studies differ mainly in the participants enrolled, who were hospitalized, preterm infants. The studies also differ in terms of the number of therapy sessions.(18,19) These differences affect comparability because preterm infants are under regulated temperature conditions, have diseases associated with a larger amount of energy expenditure, are fed on strict schedules, and have a controlled caloric intake. Furthermore, in some cases, fortified breast milk is used to increase nutritional intake of preterm infants; all of this is made to favor weight gain. However, research has found a positive effect of ATVV therapy on neonatal weight gain (18,19) and suggests a dose-response effect.(18)

In healthy full-term infants, there is a previous study using ATVV. The infants received two daily sessions, five days a week for four weeks, by a trained professional. They were admitted to the study at 2 weeks of age and were followed up to 6 months. All of the infants lived in an orphanage. The EG infants showed a daily weight gain that doubled the CG infants in the first four weeks. The limited socio-affective expressions and the use of breast milk substitutes may explain the size of the effect. The results agree that there is a favorable effect of ATVV stimulation therapy on neonatal weight gain.(12) Among the most solid hypotheses that explain the effect is that vagal system stimulation, activated by tactile stimulation, allows for a greater release of hormones such as insulin, thereby improving the gastric absorption of food.(21) However, confounding variables such as human milk exposure to tobacco metabolites and environmental pollution have not been controlled in any research.(22) Regarding height and HC, our results are similar to those reported by Kim et al., who found a difference of 0.87 cm in height in EG infants versus CG infants, and HC 1.78 cm larger in EG infants.(23) HC is an indicator of brain growth, and some studies have found that HC did not predict cognitive or fine motor scores but greater gross motor skills in boys, and it is affected by emotions, the environment,(24) and other factors. Therefore, it is understandable that a difference exists in the effect size between both studies. Another study tested the effect of ATVV in premature infants between 29 and 34 GA, who received two daily sessions of stimulation therapy during their hospitalization. The researchers found a difference between the groups in terms of height, though they found no difference in HC.(24)

Conclusion. This study shows that the ATVV stimulation therapy increases SE in full-term infants from week 2 onwards and perhaps increases adherence to exclusive breastfeeding, thereby becoming a technique to be used during the most challenging period of breastfeeding, as mothers can be trained quickly, and there are tools designed to support providing this therapy at home. Another important result of this research is that providing ATVV therapy at home reduces the weight loss in the first days and favors the neonatal growth expressed in weight gain, height, and HC. This is a significant result, as babies with low weight, borderline weight, or risk factors may benefit. Therefore, the beneficial effects of ATVV stimulation therapy can contribute to the health of healthy newborns and also to those full-term infants who are vulnerable and at nutritional risk.

Routine use of ATVV stimulation therapy in full-term infants during the first few weeks at home may help improve SE and, thus, the mother's confidence in her ability to breastfeed. This, in turn, could improve adherence to exclusive breastfeeding. Future studies should evaluate the effect of the therapy on longer follow-ups and control confounding variables that were beyond the scope of this research, such as early initiation of breastfeeding and exposure to tobacco toxins or environmental pollutants. The results are important for the clinical practice of health professionals, as they allow for evidence-based, effective, and presumably low-cost strategies in inpatient and outpatient settings. In clinical practice, stimulation therapy should replace the use of other stimuli such as cold (removing clothes, passing a wet cloth) to address the alertness difficulties that hinder strong and continuous sucking and the correct execution of the learned techniques for breastfeeding, as stimuli like these can cause stress in babies and have harmful repercussions.

Limitations. This research had budget limitations, as it did not receive any funding. In addition, there was a significant loss of participants, which required great logistical effort to continue the study. Despite this, at the end of the fieldwork, the loss of participants was a little over 10%. This study did not control variables such as exposure to environmental pollution or tobacco metabolites, intake of other liquids, or time of exclusive breastfeeding that may influence neonatal weight gain.

References

1. Fundación Salutia. Plan Decenal de Lactancia Materna y Alimentación Complementaria PDLMAC 2021-2030. Bogotá: Fundación Salutia; 2021. ISBN: 978-958-53528-1-0. [Cited: 24 Jan 2022]. Available from: https://www.icbf.gov.co/system/files/pdlmac_2021_2030_vf.pdf
2. Chopel A, Soto D, Joiner B, Benitez T, Konoff R, Rios L, et al. Multilevel Factors Influencing Young Mothers' Breastfeeding: A Qualitative CBPR Study. J. Hum. Lact. 2019; 35(2):301-17.
3. Gianni ML, Bettinelli ME, Manfra P, Sorrentino G, Bezze E, Plevani L, et al. Breastfeeding difficulties and risk for early breastfeeding cessation. Nutrients. 2019; 11(10):2266.
4. Brown A, Rance J, Bennett P. Understanding the relationship between breastfeeding and postnatal depression: The role of pain and physical difficulties. J. Adv. Nurs. 2016; 72(2):273-82.
5. Rocha B de O, Machado MP, Bastos LL, et al. Risk Factors for Delayed Onset of Lactogenesis II Among Primiparous Mothers from a Brazilian Baby-Friendly Hospital. J. Hum. Lact. 2020; 36(1):146-56.
6. Ditomasso D, Paiva AL. Neonatal weight matters: An examination of weight changes in full-term breastfeeding newborns during the first 2 weeks of life. J. Hum. Lact. 2018; 34(1):86-92.
7. Cunningham, T, Mullineaux, D, Tamilia, E, Papadelis, C, Giannone, P, Capilouto, G. Quantifying Neonatal Sucking Performance: Promise of New Methods. Semin. Speech Lan. 2017; 38(02): 147–58.
8. Thulier D. Challenging Expected Patterns of Weight Loss in Full-Term Breastfeeding Neonates Born by Cesarean. J. Obstet. Gynecol. Neonatal Nurs. 2017; 46(1):18-28.
9. Burns K, Cunningham N, White-Traut R, Silvestri J, Nelson MN. Infant stimulation: modification of an intervention based on physiological and behavioral cues. J. Obs. Gynecol. Neonatal Nurs. 1994; 23:581–9.
10. Griffith T, Rankin K, White-Traut R, Dowling D. The Relationship between Behavioral States and Oral Feeding Efficiency in Preterm Infants. Adv. Neonatal Care. 2017; 17(1):E12-E19.
11. Medoff-Cooper B, Rankin KM, Zhuoying L, Liu L, White-Traut R. Multi-sensory intervention for preterm infants improves sucking organization. Adv. Neonatal Care. 2015; 15(2):42-149.
12. White Traut R, Rankin KM, Yoder JC, Liu L, Vasa R, Geraldo V, et al. Influence of H-HOPE intervention for premature infants on growth, feeding progression, and length of stay during initial hospitalization. J. Perinatol. 2015; 35(8):636-41.

13. Chuisano SA, Anderson OS. Assessing Application-Based Breastfeeding Education for Physicians and Nurses: A Scoping Review. J. Hum. Lact. 2020; 36(4):699-709.
14. Vesga Gualdrón LM, Durán de Villalobos MM. Effect of infant stimulation on the adaptation to birth: a randomized trial. Rev. Lat. Am. Enfermagem. 2019; 27:e3176.
15. Panwara P, Kasem Ru, Wipada L Maysita S, and Pawin P. The Effect of Ginger on Breast Milk Volume in the Early Postpartum Period: A Randomized, Double-Blind Controlled Trial. Breastfeed. Med. 2016; 11(7).361-5.
16. World Health Organization. Guideline: counselling of women to improve breastfeeding practices. Geneve: World Health Organization; 2018. Available from: https://www.who.int/publications/i/item/9789241550468
17. Lin Kuei LI. A concordance correlation coefficient to evaluate reproducibility. Int. Biometric. Soc. Stable. 2017; 45(1):255-68.
18. Villamizar B, Durán M, Vargas C, Hernández H. Efecto de la estimulación multisensorial en el patrón alimenticio en prematuros. Index Enferm. 2019; 28(12):18-22.
19. White-Traut RC, Nelson MN, Silvestri JM, Vasan U, Patel M, Cardenas L. Feeding readiness behaviors and feeding efficiency in response to ATVV intervention. Newborn Infant Nurs. Rev. 2002; 2(3):166-73.
20. Chuaratanakul K. The Effect of Delivery Method on Milk Supply in Breastfeeding Mother Study. J. Obstet. Gynecol. 2016; 24(1):35-42.
21. Elataie SMAA, Bahgat RS,Thabet AM, Mahfouz FFA. The Effect of Massage Therapy on Weight and Length of Staying Premature Infant at Neonatal Intensive Care Units of Sohag city. Tanta Sci. Nurs. J. 2017; 13(2):25-42.
22. Mine T, Tanaka T, Nakasone T, Itokazu T, Yamagata Z, Nishiwaki Y. Maternal smoking during pregnancy and rapid weight gain from birth to early infancy. J. Epidemiol. 2017; 27(3):112-6.
23. KimTI, Shin YH, White-Traut RC. Multisensory intervention improves physical growth and illness rates in Korean orphaned newborn infants. Res. Nurs. Health. 2003; 26:424–33.
24. Dupont C, Castellanos-Ryan N, Séguin JR, Simard MN, Shapiro GD, Herba CM, et al. The predictive value of head circumference growth during the first year of life on early child traits. Sci. Rep. 2018; 8(1):9828.

Original article

Content validity of the NECPAL CCOMS-ICO© in Spanish to identify palliative needs in children and adolescents with Cancer

Julián Alberto López Alba[1]
https://orcid.org/0000-0002-9522-8803
Diana Marcela Jaramillo García[2]
https://orcid.org/0000-0002-1979-7182
Nadia Carolina Reina Gamba[3]
http://orcid.org/0000-0001-6434-744X

Content validity of the NECPAL CCOMS-ICO© in Spanish to identify palliative needs in children and adolescents with Cancer

Abstract

Objective: To perform content validation of the NECPAL CCOMS-ICO© instrument to identify palliative needs in Colombian children and adolescents from 8 to 17 years of age with cancer. **Methods.** Psychometric study, which used the Lawshe model, modified by Tristan, to perform content validity of the NECPAL CCOMS-ICO© instrument through expert consensus. **Results.** The Surprise Question (SQ) *Would it surprise you if this patient died within the next year?* and the parameters *Demand: Has there been any implicit or explicit expression of limitation of therapeutic effort or demand for palliative care from the patient, family, or team members?*, *Need: identified by professional members of the team*, *Checklist symptoms (ESAS) ≥ 2 persistent or refractory symptoms*, *Emotional Distress Detection (EDD) > 9*, *Social and family*

[1] Nurse, Masters in Palliative Care Nursing. Universidad El Bosque, Bogotá (Colombia).
Email: julopeza@unbosque.edu.co, julianlopez247@gmail.com.
Corresponding author.
[2] Nurse, Masters in Palliative Care Nursing. Universidad El Bosque, Bogotá (Colombia).
E-mail: djaramillog@unbosque.edu.co, dmjaga.3@gmail.com.
[3] Nurse. PhD. Professor, Universidad Nacional de Colombia, Bogotá (Colombia).
Email: ncreinag@unal.edu.co

Conflicts of interest: None

Received: June 12, 2021.

Approved: March 3, 2022.

How to cite this article: López-Alba JA, Jaramillo-García DM, Reina-Gamba NC. Content validity of the NECPAL CCOMS-ICO© in Spanish to identify palliative needs in children and adolescents with Cancer. Invest. Educ. Enferm. 2021; 40(1):e06.

DOI: https://doi.org/10.17533/udea.iee.v40n1e06.

Investigación y Educación en
Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

assessment", *Oncological disease (advanced metastatic or locoregional cancer)*, *Oncological disease (in progression (in solid tumors)* and *Oncological disease (Persistent symptoms poorly controlled or refractory despite optimizing specific treatment)*, were considered valid by the experts to identify palliative needs in Colombian children and adolescents aged 8 to 17 years with cancer according to the Lawshe criteria, as modified by Tristán. Parameters specifically related to the oncological disease belonging to the dimension *Indicators of severity/progression of the disease* showed the highest CVR' per parameter, with indices of agreement between 0.714 and 0.857. **Conclusion.** The content of the NECPAL CCOMS-ICO © 3.1 instrument is valid to identify palliative needs in Colombian children and adolescents from 8 to 17 years of age with cancer with a CVI of 0.68.

Descriptors: neoplasms; child; palliative care; needs assessment; surveys and questionnaires; validation study.

Validación de contenido del NECPAL CCOMS-ICO© en español para identificar necesidades paliativas en niños y adolescentes con cáncer

Resumen

Objetivo. Realizar validación de contenido del instrumento NECPAL CCOMS-ICO© para identificar necesidades paliativas en niños y adolescentes colombianos, entre 8 y 17 años, con cáncer. **Métodos.** Estudio psicométrico que utilizó el modelo de Lawshe modificado por Tristán para evaluar la validez de contenido del instrumento NECPAL CCOMS-ICO© a partir del consenso de expertos. **Resultados.** La Pregunta Sorpresa *¿Le sorprendería que este paciente muriese a lo largo del próximo año?* y los parámetros de *Demanda: ¿Ha habido alguna expresión implícita o explícita de limitación de esfuerzo terapéutico o demanda de atención paliativa de paciente, familia, o miembros del equipo?*, *Necesidad: identificada por profesionales miembros del equipo*, *Checklist síntomas ≥ 2 síntomas persistentes o refractarios*, *Detección de Malestar Emocional > 9, Valoración social y familiar*, *Enfermedad oncológica (Cáncer metastásico o locoregional avanzado)*, *Enfermedad oncológica (en progresión (en tumores sólidos)* y *Enfermedad oncológica (Síntomas persistentes mal controlados o refractarios a pesar de optimizar el tratamiento específico)*, se consideraron válidos por los expertos para la identificación de necesidades paliativas en niños y adolescentes colombianos, entre 8 y 17 años, con cáncer, de acuerdo con los criterios de Lawshe modificados por Tristán. Los parámetros relacionados específicamente con la enfermedad oncológica pertenecientes a la dimensión *Indicadores específicos de severidad y progresión de la enfermedad* presentaron los mayores valores de la Razón de Validez de Contenido por parámetro que oscilaron entre 0.714 y 0.857. **Conclusión.** La validez de contenido del instrumento en español NECPAL CCOMS-ICO© mostró ser apropiada para identificar las necesidades paliativas en niños y adolescentes colombianos, entre 8 y 17 años, con cáncer.

Descriptores: neoplasia; niño; cuidados paliativos; evaluación de necesidades; encuestas y cuestionarios; estudio de validación.

Validação de conteúdo do NECPAL CCOMS-ICO© em espanhol para identificar necessidades paliativas em crianças e adolescentes com câncer

Resumen

Objetivo. Realizar validação de conteúdo do instrumento NECPAL CCOMS-ICO© para identificar necessidades paliativas em crianças e adolescentes colombianos de 8 a 17 anos com câncer. **Métodos.** Estudo psicométrico que utilizou o modelo de Lawshe modificado por Tristán para avaliar a validez de conteúdo do instrumento NECPAL CCOMS-ICO© através do consenso de especialistas. **Resultados.** A Pergunta Surpresa. *Lhe surpreenderia que este paciente morresse ao longo do próximo ano?* e os parâmetros de *Demanda: Tem tido alguma expressão implícita ou explícita de limitação de esforço terapêutico ou demanda de atenção paliativa de paciente, família, ou membros da equipe?*, *Necessidade: identificada por profissionais membros da equipe*, *Checklist sintomas ≥ 2 sintomas persistentes ou refratários*, *Detecção de Mal-estar Emocional > 9, Valoração social e familiar*, *Doença oncológica (Câncer metastático ou locorregional avançado)*, *Doença oncológica (em progresso (em tumores sólidos)* e *Doença oncológica (Sintomas persistentes mal controlados ou refratários apesar de otimizar o tratamento específico)*, foram considerados válidos pelos especialistas para a identificação de necessidades paliativas em crianças e adolescentes colombianos de 8 a 17 anos com câncer, de acordo com os critérios de Lawshe modificados por Tristán. Os parâmetros relacionados especificamente com a doença oncológica pertencentes à dimensão *Indicadores específicos de severidade e progressão da doença* apresentaram os maiores valores da Razão de Validez de Conteúdo por parâmetro que oscilaram entre 0.714 e 0.857. **Conclusão.** A validez de conteúdo do instrumento em espanhol NECPAL CCOMS-ICO© mostrou ser apropriada para identificar as necessidades paliativas nas crianças e adolescentes colombianos de 8 a 17 anos com câncer.

Descritores: neoplasia; criança; cuidados paliativos; determinação de necessidades de cuidados de saúde; inquéritos e questionários; estudo de validação.

Introduction

According with data provided by the National Public Health Surveillance System in Colombia, the mortality rate due to cancer is estimated at two for every 100,000 minors under 18 years of age, which includes deaths due to acute pediatric leukemia.(1) When patients are diagnosed in terminal phase, health professionals must determine and assess the needs caused by the late effects that cancer brings as a catastrophic disease in the physical, mental, social, and psychological spheres.(2)

With respect to the information offered by the Work Group Palliative Care for Children of the European Association for Palliative Care, the estimated European prevalence rate for children and young people who may require palliative care is of 10 to 16 for every 10,000 inhabitants between 0 and 19 years of age (15 for every 10,000 if neonatal deaths are excluded), of which approximately 30% of these patients suffer from cancer, which would mean that, in a population of 250,000 people in which there are about 50,000 children, in one year there is a probability that eight children will die from life-limiting diseases, 37.5% as a consequence of cancer; 60 to 80 would suffer a life-limiting disease; 30 to 40 of them would need specialized palliative care, that is 50%.(3)

According to figures from the Colombian Ministry on Health and Social Protection, the Department of Epidemiology and Demographics and the National Cancer Observatory (ONC, for the term in Spanish) in Colombia, in the 2014 report, the age group with the highest mortality rate due to childhood cancer between 2005 and 2011 corresponds to minors between 10 and 18 years of age.(4) The aforementioned coincides with the 2016 report by the Colombian Fund for High-Cost Diseases on the distribution of childhood cancer, according to age group and gender, which denotes that the most-affected age group was comprised by those between 10 and 14 years of age.(5) The departments that were most affected were: Bogotá D.C., followed by Meta, Caldas, Antioquia, Valle del Cauca, Santander, Huila, Quindío, and Risaralda with a prevalence range from 331 to 543 per million inhabitants under 18 years of age.(5)

Given this scenario, one of the main challenges health professionals must face is to identify these palliative needs in people with life-threatening diseases, such as cancer. Internationally, instruments have been validated, like the IDC-Pal(6) and the PCP(7), to determine the amenable complexities and the phase in palliative care in which a patient is and others, like the RADPAC,(8) SPICT–ES™,(9) and NECPAL CCOMS-ICO©(10) to identify palliative needs; nevertheless, although the last two are validated in Spanish, none of those mentioned has been used in children and adolescents with cancer, unlike the PaPas Scale,(11) which was validated specifically in this type of population – but in English – and has five domains (Life expectancy, Expected outcome of disease-directed treatment, Performance status, Symptom burden and Problems and Preferences of the patient, family, or health professional). The aim of this study was to validate the contents of the NECPAL CCOMS-ICO© instrument to identify palliative needs in Colombian children and adolescents from 8 to 17 years of age with cancer.

Methods

This was a psychometric study, using the Lawshe model(12) modified by Tristán,(13) to determine the content validity of the NECPAL CCOMS-ICO© instrument – adapting it to identify palliative needs in Colombian children and adolescents from 8 to 17 years of age with cancer – through the assessment by seven Colombian professional medical experts of which one is a specialist in anesthesiology and interventionism in pain and palliative care with a master's degree in pain management, one is a specialist in pediatrics and pediatric oncology, three are specialists in pediatrics and pediatric palliative care, one is a specialist in family medicine and pediatric palliative care, and one is pediatrist specialist in pediatric haemato-oncology and doctor in medicine. All the experts have between 5 and 26 years of care experience in their area of expertise, as well as teaching experience between 5 and 23 years and research experience between 4 and 24 years.

The NECPAL CCOMS-ICO© instrument, developed by Gómez *et al.,*(10) was created from a Spanish adaptation, the Prognostic Indicator Guidance (PIG) scales(14) and the Supportive & Palliative Care Indicators Tool (SPICT)(15) in a joint initiative by the QUALY Observatory (WHO Collaborating Center for Public Programs on Palliative Care (CCOMS, for the term in Spanish) and the Catalan Institute of Oncology (ICO). The 3.1 version of the NECPAL CCOMS-ICO©, which dates to 2017,(16) was used by the authors in this study to conduct the psychometric study. This instrument, validated in Spain, is useful to identify people with advanced complex chronic processes, who are specially affected, have palliative needs and are in social and health services. It is comprised of a surprise question (SQ) *Would you be surprised if this patient died within the next year*, nine dimensions and the following parameters, as shown in Table 1.

The instrument is available in Spanish and its interpretation considers that only if the answer to the first question (surprise) is negative, the remaining parameters are completed with which the NECPAL is deemed positive when the answer to the surprise question (SQ) was *"no"* and one or more of the other parameters was positive. This instrument has been subjected to validation processes in adult population in Latin American countries, like Chile, where a cultural adaptation was carried out, along with content validity, piloting, application, and statistical analysis of the NECPAL-CCOMS-ICO 3.1©;(17) Argentina, where the instrument was used to identify people with advanced chronic diseases and needs for palliative care in the city of Buenos Aires;(18) and Colombia, where Moreno and Peláez(19) conducted face validation of the NECPAL - CCOMS© instrument in Bogotá D.C by using professional health experts to verify comprehension, precision, and clarity of the instrument in the health staff.

The dimension of *geriatric syndromes* was not kept in mind because it was not applicable to the target population in this study and only included specific severity or progression indicators related with oncological disease, so that, in addition to the surprise question (SQ), the remaining parameters shown in Table 1 were submitted to the content validation process by experts.

Personal or telephone contact was established with the experts. Three documents were delivered

Table 1. Dimensions of the NECPAL CCOMS-ICO© instrument version 3.1 2017

Surprise question (SQ)	*Would you be surprised if this patient died within the next year?*	
Dimensions	**Parameter**	
"Demand" or "Need"	Demand: Has there been any implicit expression or limitation of therapeutic effort or demand for palliative care from the patient, family, or staff members? Need: identified by professional staff members	
Overall clinical progression indicators - The last six months - Not related to recent/reversible intercurrent process	Nutritional decline	Weight loss > 10%
	Functional decline	• Karnofsky or Barthel deterioration >30% • Loss of >2 ADLs
	Cognitive decline	Loss >5 minimental or >3 Pfeiffer
Severe dependence	Karnofsky <50 or Barthel <20	Anamnesis clinical data
Geriatric syndromes	• Falls • Pressure ulcers • Dysphagia • Delirium • recurrent infections	• Anamnesis clinical data • ≥ 2 geriatric syndromes (recurrent or persistent)
Persistent symptoms	Pain, weakness, anorexia, digestive…	•Symptoms checklist (ESAS) >2 persistent or refractory symptoms
Psychosocial aspects	Distress and/or Severe adjustment disorder	Emotional Discomfort Detection (EDD) >9
	Severe social vulnerability	Family social assessment
Multi-morbidity	>2 advanced chronic diseases or conditions (from the list of specific indicators)	
Use of resources	Assessment of the demand or intervention intensity	• >2 emergency or unplanned admissions 6 months • Increased demand or intervention intensity (home care, nursing interventions, *etc*.,)
Specific indicators of severity/ progression of the disease	Oncological disease	• Advanced locoregional or metastatic cancer • In progression (in solid tumors) • Poorly controlled or refractory persistent symptoms despite optimizing specific treatment.

to those who accepted (letter of invitation to participate, characterization sheet by the expert and content validation instructions), which contained a validation grid for professionals to evaluate the surprise question (SQ) and the parameters, being able to only select one of the following options: *Essential, Useful but not essential,* and *Not necessary*, besides having a grid to conduct the observations the expert considered pertinent.

After receiving the documents from the experts, the researchers gathered to analyze the information provided by said experts and a Microsoft Excel database was constructed to determine the Content Validity Rate (CVR and CVR') and the Content Validity Index (CVI) for each of the items and, finally, the Instrument's Content Validity Index, through the equations described in the Lawshe model(12) modified by Tristán(13) for which the CVI cut-off point must be ≥ 0.58 to consider the question and the parameters valid (preferring the CVI over the Kappa index because it permits a reduced number of experts in areas as specific as pediatric palliative care).

Results

The results show that the Surprise question (SQ) *Would you be surprised if this patient died within the next year* and the parameters *Demand: Has there been any implicit expression or limitation of therapeutic effort or demand for palliative care from the patient, family, or staff members*, *Oncological disease (Advanced locoregional or metastatic cancer), Oncological disease (in progression (in solid tumors),* and *Oncological disease (Poorly controlled or refractory persistent symptoms despite optimizing specific treatment),* exceed the cut-off point of 0.58, which is why they are considered acceptable according with criteria by Lawshe(12) modified by Tristán.(13) Moreover, the authors in this study have decided to include in this same category the parameters of *Need: identified by professional staff members, Symptoms checklist (ESAS) ≥ 2 persistent or refractory symptoms, EDD > 9, Family and social assessment* given that, although they all scored at 0.5714, their value is very close to the cut-off point.

Besides the Surprise question (SQ), of the 16 instrument's parameters subjected to the content validation process, eight were considered pertinent by the experts to identify palliative needs in children and adolescents with cancer and those related specifically with the oncological disease belonging to the dimension *specific disease severity/progression indicators* had the highest CVR' per parameter, with indices of agreement among experts ranging between 0.714 and 0.857. The global CVI was 0.6825. The CVR for each of the items are shown in Table 2.

Table 3 evidences that the CVI by expert is adequate because it exceeds the cut-off point defined by the Lawshe model,(12) modified by Tristán,(13) that is CVI > 0.58.

The parameters *Nutritional decline (Weight loss > 10%), Cognitive decline (Loss ≥ 5 minimental or ≥ 3 Pfeiffer), >2 advanced chronic diseases or conditions (from the list of specific indicators), Assessment of the intervention demand or intensity: > 2 emergency or unplanned admissions (six months), Assessment of the intervention demand or intensity: increased intervention demand or intensity (home care, nursing interventions, etc.)* were not considered acceptable by the experts; however, the instrument's CVI is 0.68.

Although the parameters *Functional decline (Karnofsky or Barthel deterioration > 30%* and *Functional decline (loss of >2* ADLs*)* and *Karnofsky <50 or Barthel <20* did not reach the cut-off point, the experts coincided in that the Karnofsky and Barthel scales are not validated and adequate clinical tools to apply in children and adolescents with cancer, which is why they suggested in the observation to replace them with the Lansky scale.

Table 2. Content validity index for the NECPAL CCOMS-ICO© 3.1 parameters

Dimension/ Parameter	Score			CVR	CVR’
	Essential	Useful	Not necessary		
Demand or need					
Demand	5	2	0	0.4286	0.7143
Need	4	3	0	0.1429	0.5714
Progression indicators					
Nutritional decline	0	6	1	-1.0000	<0.0001
Functional decline *	2	3	2	-0.4286	0.2857
Functional decline**	3	2	2	-0.1429	0.4286
Cognitive decline	0	2	5	-1.0000	<0.0001
Severe dependence	1	4	2	-0.7143	0.1429
Persistent symptoms	4	3	0	0.1429	0.5714
Psychosocial aspects					
Distress and/or Severe adjustment disorder	4	2	1	0.1429	0.5714
Severe social vulnerability	4	2	1	0.1429	0.5714
Multi-morbidity	1	3	3	-0.7143	0.1429
Use of resources					
>2 emergency or unplanned admissions (six months)	2	4	1	-0.4286	0.2857
Increased demand or intervention intensity	3	4	0	-0.1429	0.4286
Severity or progression indicators					
Advanced locoregional or metastatic cancer	5	1	1	0.4286	0.7143
In progression	6	1	0	0.7143	0.8571
Poorly controlled or refractory persistent symptoms	6	1	0	0.7143	0.8571
Surprise question: Would you be surprised if this patient died within the next year?	5	2	0	0.4286	0.7143

* Karnofsky or Barthel deterioration >30% ** Loss of >2 ADLs

Table 3. Content validity index by expert

Expert	Global CVI
1	0.525
2	0.76
3	0.85
4	0.645
5	0.83
6	0.675

Bearing in mind the results obtained, the work eliminated eight items that did not comply with that established by the Lawshe model(12) modified by Tristán;(13) according to expert consensus, who did not consider these items pertinent to identify palliative needs in children and adolescents from 8 to 17 years of age with cancer.

In the final version, the instrument was integrated with the SQ *Would you be surprised if this patient died within the next year* and eight parameters belonging to four dimensions distributed, thus: the dimension *Demand or Need* was comprised by the parameters *Demand: Has there been any implicit expression or limitation of therapeutic effort or demand for palliative care from the patient, family, or staff members?* and *Need: identified by the professional staff members*, the dimension *Persistent symptoms* remained with the parameter *Symptom checklist (ESAS) ≥ 2 persistent or refractory symptoms*, the dimension *Psychosocial aspects* was integrated by both parameters from the original version *Emotional Discomfort Detection (EDD) > 9* and *Family and social assessment* and the dimension *Specific disease severity/progression indicators* was comprised by the parameters *Oncological disease (Advanced locoregional or metastatic cancer)*, *Oncological disease (in progression (in solid tumors)* and *Oncological disease (Poorly controlled or refractory persistent symptoms despite optimizing specific treatment)*. The final results are indicated in Table 4.

Table 3. NECPAL CCOMS ICO instrument for pediatric and adolescent population

Surprise question (SQ)		*Would you be surprised if this patient died within the next year?*
Dimension	**Parameter**	
"Demand" or "Need"	Demand: Has there been any implicit expression or limitation of therapeutic effort or demand for palliative care from the patient, family, or staff members?	
	Need: Identified by professional staff members	
Persistent symptoms	Pain, weakness, anorexia, dyspnea, digestive	Symptoms checklist (ESAS) ≥ 2 persistent or refractory symptoms
Psychosocial aspects	Distress and/or Severe adjustment disorder	Emotional Discomfort Detection (EDD) > 9
	Severe social vulnerability	Family and social assessment
Specific disease severity/ progression indicators	Oncological disease	Advanced locoregional or metastatic cancer
		Cancer in progression (in solid tumors)
		Poorly controlled or refractory persistent symptoms despite optimizing specific treatment

Discussion

The Lawshe model,(12) modified by Tristán(13) to conduct the content validity process of an instrument, has become useful in this study to determine expert consensus; this methodology has been used successfully by other authors, like Vesga and Ruiz,(20) who evaluated the validity and reliability of a professional care scale in Spanish, finding that the tool obtained a CVI of 0.893 and validity for each of the parameters that exceeds the values established in the literature. Likewise, in 2019 Castro A(21) validated the Spanish version of the instrument Jefferson Scale of Attitudes toward Physician – Nurse Collaboration (JSAPNC) by using the Lawshe model modified by Tristán, obtaining a CVI of 0.84.

Following the same methodology, Cruz and Muñoz,(22) validated an instrument to identify the level of vulnerability of health workers to tuberculosis in health institutions (IVTS TB-001) obtaining a CVI of 0.91. Moreover, Corredor Parra,(23) presents a study titled *Validity and reliability of the instrument of quality of life by Betty Ferrell, for people with chronic disease*, which was a study of six dimensions, with 41 items with CVR with high values ranging between N = (0.77 – 1); only 14 items did not have an adequate value to include them in the results, given that they were a value ranging between N = (0.11 – 0.55). The statistical test used was the CVI by Lawshe modified by Tristán- López, it was determined an adequate content validity with CVI of N = (0.9), an adequate CVI to use in the local context, which demonstrates that the CVI by Lawshe modified by Tristán- López, is widely used.

The surprise question *Would you be surprised if this patient died within the next year* and the parameter *Need: Identified by professional staff members*, validated as pertinent to identify palliative needs in Colombian children and adolescents with cancer, coincide with affirmations by other authors,(11) upon considering terminality as a factor that undoubtedly proposes the need for palliative care or end-of-life care. Similarly, the parameter *Demand: Has there been any implicit expression or limitation of therapeutic effort or demand for palliative care from the patient, family, or staff members* has been documented by other authors who highlight even the importance of the palliation as purpose of any useful therapeutic intervention.(24) In this respect, the Spanish Society of Outpatient Pediatrics and Primary Care(25) has emphasized on the importance of consensus with the family on the importance of not continuing futile invasive maneuvers that temporarily prolong life at the expense of patient suffering.

Depending on the child's age, the degree of compromise of the disease, the dynamic status and capacity to carry out activities both personally and with the people around them, the Lansky scale is evaluated. This scale is measured through scores, every 10 points correspond to a different category that ranges from 10 to 100, with 10 being the most-severe restriction score and 100, which suggests optimal conditions in their functional state, given that in them it can be difficult to apply the criteria of the Karnofsky and Eastern Cooperative Oncology Group (ECOG) scales that measure the quality of life in oncology patients.(26) Hence, the Lansky scale provides quantifiable, reproducible, and significant data, necessary for effective monitoring and management of children with cancer, having proven even useful to demonstrate significant improvement in functionality and independence after months of chemotherapy in minors with lymphomas and miscellaneous tumors compared with others suffering leukemia, tumors of the central nervous system, and other solid tumors.(27)

In turn, the persistence and refractoriness of symptoms in a child with cancer, identified in the parameter *Pain, weakness, anorexia, dyspnea, digestive... Symptom checklist (ESAS) >2 persistent or refractory symptoms,* was found valid by the experts participating in the study as a component of the 2017 NECPAL CCOMS-ICO© 3.1 instrument that identifies palliative needs in this population group. The aforementioned coincides with that reported by distinct authors(28) who highlight that not only the diagnosis or prognosis can increase this need along with the treatment, mentioning the high prevalence of nausea, vomit, and pain in the pediatric patient with chemotherapy and radiotherapy, with palliative sedation standing out as alternative to control hard-to manage symptoms, especially in end-of-life scenarios. (29)

The parameters *Distress and/or Severe adjustment disorder; Emotional Discomfort Detection (EDD);* and *Severe social vulnerability; Family and social assessment* were accepted by the experts because socio-family vulnerability and emotional discomfort are determining factors during the course of the disease. This agrees with that manifested by other researchers (30,31) who have documented the emotional experience in pediatric patients as a burden that sometimes includes unpleasant sensations, like discomfort, sleep problems, crying, and apprehension to the treatment, adding to the above the change in social and family roles, where the parents perceive more negative interactions strongly associated with stress, given that they refer to greater work conflicts when missing work due to their children's disease.

The parameters *Oncological disease: Advanced locoregional or metastatic cancer, Oncological disease: in progression (in solid tumors)* and *Oncological disease: Poorly controlled or refractory persistent symptoms despite optimizing specific treatment* were found pertinent by the experts to identify palliative needs in Colombian children and adolescents from 9 to 17 years of age with cancer. In this regard, other authors have pointed to neoplasia as the second cause of death in children > 1 year of age, highlighting that solid tumors (lung carcinoma, osteosarcoma, thyroid carcinoma, rhabdomyosarcoma, teratocarcinoma, melanoma, and Wilms tumor) are associated with higher mortality compared with leukemia, besides the increased risk of metastasis and poor prognosis according to stage.(32)

Furthermore, the findings herein coincide with some of the items and domains of the PaPas Scale,(11) an instrument validated in English to identify palliative needs in pediatric population, given that item 1.2 from this instrument corresponds to domain 1 *Life expectancy* also tries to establish the prognosis perceived by the treating professional, as well as the surprise question from the NECPAL CCOMS-ICO© version 3.1 2017. Items 4.1 and 4.2 from domain 4 *Burden of symptoms and problems* of the PaPaS Scale, on the number and intensity of symptoms, agree with the parameter *Symptom checklist (ESAS) ≥ 2 persistent or refractory symptoms,* as well as items 4.3, 4.4 and 4.5 *Psychological distress of the patient, Psychological distress of the parents and Psychological distress of the siblings* from domain 4 *Burden of symptoms and problems* of the PaPas Scale that resemble the parameters *Distress and/or Severe adjustment disorder: Emotional Discomfort Detection (EDD) > 9* and *Severe social vulnerability: Family and social assessment*, all considered valid by the experts participating in the assessment process.

Consequently, palliative care is appropriate for children and adolescents suffering from a highly life-threatening disease, like cancer, where – according to its stage – there are unpleasant symptoms, like pain and other symptoms, which require not only medical support, but also social, spiritual, and psychological attention during the illness and bereavement to improve the quality of life of minors and their families. The need to have instruments to identify palliative needs is fundamental to establish criteria to identify these palliative needs in different environments, from the early phases of the disease to the end of life, favoring an early and quality palliative approach upon a scenario of oncological disease in the pediatric and adolescent population.

Finally, the authors in this study recognize as limitation that the number of pediatric palliative care in Colombia is scarce, which represents difficulties when wishing to have a considerable number of experts to conduct the content validity process, thus highlighting that – to date – Colombia has no formation programs in pediatric palliative care for professionals in health sciences.

In conclusion, the 2017 NECPAL CCOMS-ICO© version 3.1 instrument's content validity in Spanish proved appropriate to identify palliative needs in Colombian children and adolescents from 8 to 17 years of age with cancer with a CVI of 0.68. The study provides a valid instrument from the consensus by experts to identify palliative needs in the study's target population for the Colombian context, validated in Spanish. These results enrich the nursing discipline by generating knowledge in the field of pediatric palliative care and, specifically, in validation processes of instruments, recognizing that the 2017 NECPAL CCOMS-ICO© version 3.1 questionnaire for Colombian children and adolescents could be used by distinct specialties to identify palliative needs in Colombian children and adolescents with cancer from 8 to 17 years of age.

Information on conflicts of interest. The authors declare having no conflicts of interest.

Funding. This article derives from the degree work to qualify for the title of Master of Nursing in Palliative Care from Universidad El Bosque. No scholarships, grants, or any other type of funding was received.

References

1. García OEP, Bonilla HQ, González M. Protocolo Vigilancia en Salud Pública. Cáncer Infant. 2014; (00):28.
2. National Cancer Institute. Efectos tardíos del tratamiento anticanceroso en la niñez [Internet]. 2005 [cited 7 Feb. 2022]. Available from: https://www.cancer.gov/espanol/tipos/infantil/efectos-tardios-pdq
3. Villegas RJA, Antuña GMJ. Cuidados Paliativos Pediátricos. Rev Bol Pediatr 2012; 52: 131-145.
4. Ministerio de Salud y Protección Social. Dirección de Epidemiología y Demografía Análisis de Situación de Salud ASIS Colombia [Internet]; 2016. [cited 7 Feb. 2022]. Available from: https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/VS/ED/PSP/asis-colombia-2016.pdf
5. Fondo Colombiano de Enfermedades de Alto Costo. Cuenta de alto costo. Situación del cáncer en la población pediátrica atendida en el SGSSS de Colombia [Internet]; 2017 [cited 7 Feb. 2022]. Available from: https://cuentadealtocosto.org/site/images/Libro_Situacion_Cancer_Pediatrico_201 7.pdf
6. IDC-Pal. (Instrumento Diagnóstico de la Complejidad en Cuidados Paliativos). 2014. [Internet]. Consejería de Igualdad, Salud y Políticas sociales. Fundación Cudeca. [cited 7 Feb. 2022]. Available from: http://www.cuidarypaliar.es/wp-content/uploads/2016/09/Instrumento-diagn%C3%B3stico-de-la-complejidad-en-cuidados-paliativos.-Servicio-Andaluz-de-Salud_2014.pdf
7. Masso M, Allingham SF, Banfield M, Johnson CE, Pidgeon T, Yates P, et al. Palliative Care Phase: inter-rater reliability and acceptability in a national study. Palliat. Med. 2015; 29(1):22-30.
8. Thoonsen B, Engels Y, Rijswijk E, Verhagen S, Van Weel C, Groot M, et al. Early identification of palliative care patients in general practice: development of RADboud indicators for Palliative Care Needs (RADPAC). Br. J. Gen. Pract. 2012; 62(602):e625-31.
9. Alonso-Fachado A, Sansó-Martínez N, Martín-Roselló M, Ventosa-Rial J, Benito-Oliver E, Gómez-García R, et al. Adaptación y validación al español del cuestionario de identificación paliativa SPICT-ES™. Rev. Saude Pub. 2018; 52:3.
10. Gómez-Batiste X, Martínez-Muñoz M, Blay C, Amblàs J, Vila L, Costa X. Identificación de personas con enfermedades crónicas avanzadas y necesidad de atención paliativa en servicios sanitarios y sociales: elaboración del instrumento NECPAL CCOMS-ICO©. Med. Clin. (Barc). 2013; 140(6):241-5
11. Bergstraesser E, Hain RD, Pereira JL. The development of an instrument that can identify children with palliative care needs: The Paediatric Palliative Screening Scale (PaPaS Scale): a qualitative study approach. BMC Palliat. Care. 2013; 12:20.
12. Lawshe CH. A quantitative approach to content validity. Pers. Psychol. 1975; 28(4): 563-75.
13. Tristan A. Modificación al modelo de Lawshe para el dictamen cuantitativo de la validez de contenido de un instrumento objetivo. Av. Medición. 2008; 6:37–48.
14. Royal College of General Practitioners. The Gold Standards Framework Proactive Identification Guidance (PIG): The National GSF Centre's guidance for clinicians to support earlier identification of patients nearing the end of life leading to improved proactive person-centered care [Internet]; 2016. Available from: https://www.goldstandardsframework.org.uk/cd-content/uploads/files/PIG/NEW%20PIG%20-%20%20%2020.1.17%20KT%20vs17.pdf
15. The University of Edinburgh. Supportive and Palliative Care Indicators Tool (SPICTTM) [Internet]; 2019. Available from: https://www.spict.org.uk/the-spict/
16. Gómez-Batiste Xavier, et al. Recomendaciones para la atención integral e integrada de personas con enfermedades o condiciones crónicas avanzadas y pronóstico de vida limitado en Servicios de Salud y Sociales: NECPAL-CCOMS-ICO© 3.1 [Internet]; 2017. [Cited 7 Feb. 2022]. Available from: http://ico.gencat.cat/web/.content/minisite/ico/professionals/documents/qualy/arxius/INSTRUMENTO-NECPAL-3.1-2017-ESP_Completo-Final.pdf
17. Troncoso J, Morales-Meyer T, Villarroel J, Turrillas P, Rodríguez-Nuñez A. Adaptación y validación en Chile del instrumento de identificación de pacientes con necesidad de atención paliativa: NECPAL-CCOMS-ICO 3.1©. 2021. Aten. Primaria. 2021; 53(4)101994.
18. Tripodoro VA. Proyecto NECPAL CCOMS-ICO© para la identificación de personas con enfermedades crónicas avanzadas y necesidades de atención paliativa en la Ciudad de Buenos Aires, Argentina [Internet]; 2016 [Cited

7 Feb. 2022]. Available from: https://www.tesisenred.net/bitstream/handle/10803/385615/tesdoc_a2016_tripodoro_vilma_proyecto_necpal.pdf?sequence=1

19. Celis J, Vargas M. Validez facial del instrumento NECPAL - CCOMS© en Bogotá D.C. – Colombia [Internet]. 2020 [cited 7 Feb. 2022]. Bogotá: Pontificia Universidad Javeriana. Available from: https://repository.javeriana.edu.co/handle/10554/52115
20. Vesga L, Ruiz C. Validez y confiabilidad de una escala de cuidado profesional en español. Av. Enferm. 2016; 34(1):69-78.
21. Castro A. Validación de la versión en español del instrumento Jefferson Scale of Attitudes toward Physician – Nurse Collaboration (JSAPNC) [Internet]. Bogotá: Universidad Nacional de Colombia; 2019 [cited 7 Feb. 2022]. Available from: http://www.bdigital.unal.edu.co/72265/
22. Cruz O, Muñoz A. Validación de instrumento para identificar el nivel de vulnerabilidad de los trabajadores de la salud a la tuberculosis en instituciones de salud. (IVTS TB001). Med. Segur. Trab. 2015; 61(241):448-67.
23. Corredor L. Validez y confiabilidad del instrumento de calidad de vida de Betty Ferrell, para personas con enfermedad crónica" [Internet]; 2014 [cited 7 Feb. 2022]. Bogotá: Universidad Nacional de Colombia. Available from: https://core.ac.uk/download/pdf/77275469.pdf
24. González CL. Consideraciones sobre la Limitación del esfuerzo terapéutico (LET) en pediatría. Una aproximación a los conocimientos, prácticas y actitudes en la comunidad académica y asistencial del Hospital de La Misericordia y del Departamento de Pediatría de la Universidad Nacional de Colombia [Internet]. Bogotá: Universidad Nacional de Colombia; 2014 [cited 7 Feb. 2022]. Available from: http://www.bdigital.unal.edu.co/12322/1/luisricardogonzalezcruz.2014.pdf
25. Sociedad Española de Pediatría Extrahospitalaria y Atención Primaria. Limitación del Esfuerzo Terapéutico en menores [Internet]; 2015 [cited 7 Feb. 2022]. Available from: https://sepeap.org/limitacion-de-esfuerzo-terapeutico-en-menores/
26. Ministerio de Salud. Manual control de síntomas 2013. Cuidados Paliativos cáncer infantil. Santiago de Chile: Ministerio de Salud; 2016 [cited 7 Feb. 2022]. Available from: http://www.uss.cl/biblioteca/wp-content/uploads/2016/10/Manual-Control-de-s%C3%ADntomas-cuidados-paliativos-c%C3%A1ncer-infantil-MINSAL.pdf
27. Batra P, Kumar B, Gomber S, Bhatia MS. Assessment of Quality of Life during Treatment of Pediatric Oncology Patients. Indian J. Public Health. 2014; 58(3):168-73.
28. Díaz K, Reyes J, Morgado K, Everardo D. Síntomas en niños con cáncer y estrategias de cuidado familiar. Rev. Cuid. 2019; 10(1):e597.
29. González M, Velasco G. Sedación y analgesia en la fase terminal en pediatría. Informe de dos casos y revisión de la literatura. Acta Pediatr. Mex. 2013; 34(1):21-7.
30. Ministerio de Salud. Lineamientos para la atención integral en cuidados paliativos [Internet]. [cited 7 Feb. 2022]. Available from: https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/VS/PP/ENT/lineamnts-cuids-paliatvs-gral-pediatrc.pdf
31. Pozo C, Bretones B, Martos M, Morillejo E, Cid N. Repercusiones psicosociales del cáncer infantil: apoyo social y salud en familias afectadas. Rev. Latinoam. Psicol. 2015; 47(2):93-101.
32. Instituto Nacional de Cáncer. Tratamiento del sarcoma de tejido blando infantil (PDQ®) –Versión para profesionales de salud [Internet]; 2019 [cited 7 Feb. 2022]. Available from: https://www.cancer.gov/espanol/tipos/sarcoma-de-tejido-blando/pro/tratamiento-tejido-blando-infantil-pdq

Original article

Creating spaces for care for nurses working in the pandemic in light of the nursing process

Julia Valeria de Oliveira Vargas Bitencourt[1,7]
https://orcid.org/0000-0002-3806-2288
Juliana Baldissera Dors[2,7]
https://orcid.org/0000-0003-4862-2258
Kimberly Lana Franzmann[3,7]
https://orcid.org/0000-0003-4012-2240
Débora Cristina Morais Migliorança[4,7]
https://orcid.org/0000-0003-1090-2318
Eleine Maestri[5,7]
https://orcid.org/0000-0002-0409-5102
Priscila Biffi[6]
https://orcid.org/0000-0001-5476-5840

Creating spaces for care for nurses working in the pandemic in light of the nursing process

Abstract

Objective. To make a dialog about the nursing professionals' perception regarding how they cope with COVID-19 and the repercussions on their practice and personal life. **Methods.** This is a qualitative study, typified as participatory action research, which was carried out using Paulo Freire's Research Itinerary linked to the steps of the Nursing Process. To that end, the following guiding question was launched: How is it for you to act as a nursing professional in the hospital area during the COVID-19 pandemic? **Results.** Three syntheses emerged, which guided the discussion: The challenges of being a nursing professional in the pandemic. The learning and growth that the challenges of the pandemic have generated and Nursing as the protagonist of care. The Virtual Culture Circle was a space where, despite the limitations, provided a social interaction among the participants, with mutual

1 Nurse, PhD. Professor.
E-mail: julia.bitencourt@uffs.edu.br
2 Undergraduate Nursing Student.
E-mail: ju.dors@hotmail.com
3 Undergraduate Nursing Student.
E-mail: kimberlyftanz@gmail.com
4 Undergraduate Nursing Student.
E-mail: migliorancadebora@gmail.com
5 Nurse, PhD. Professor.
E-mail: eleine.maestri@uffs.edu.br
6 Bachelor's Degree in Nursing, Trainee Nurse at the Unimed Hospital, Chapecó, SC, Brazil.
E-mail: priscilabiffi99@gmail.com.
Corresponding author.
7 Federal University of Southern Border - Chapecó, SC, Brazil.

Conflicts of interest: None

Received: September 10, 2021.

Approved: Marzo 3, 2022.

How to cite this article: Bitencourt JVOV, Dors JB, Franzmann KL, Migliorança DCM, Maestri E, Biffi P. Criando espaços de cuidados a enfermeiros atuantes na pandemia a luz do processo de enfermagem. Invest. Educ. Enferm. 2022; 40(1):e07.

DOI: https://doi.org/10.17533/udea.iee.v40n1e07.

exchange of experiences, with many reflections, besides expressions of feelings, experiences and learning obtained during the COVID-19 pandemic. **Conclusion.** The nurses perceived that, although this moment highlights and appreciates the profession, nursing is overloaded and exhausted by the COVID-19 pandemic, with repercussions on professional and personal life. The care for those who care needs to be planned and implemented in different scenarios, and the Nursing Process built based on theoretical and scientific knowledge guide the effective improvement of the quality of health care.

Descriptors: nursing process; occupational health; COVID-19; hospital care.

Creando de espacios de cuidado para los enfermeros que laboran en la pandemia a la luz del proceso de enfermería

Resumen

Objetivo. Dialogar sobre la percepción de los profesionales de enfermería con respecto a la lucha contra el COVID-19 y las repercusiones en su práctica profesional y en su vida personal. **Métodos.** Estudio cualitativo del tipo investigación acción participante, realizado mediante el itinerario de investigación de Paulo Freire vinculado a las etapas del Proceso de Enfermería. Para ello se propuso la siguiente pregunta orientadora: ¿Cómo ha sido su actuación como profesional de la enfermería en el área hospitalaria durante la pandemia de COVID-19? Para organizar el Círculo de Cultura Virtual (CCV), las investigadoras invitaron por W*hatsApp*® a los profesionales de enfermería de las instituciones hospitalarias de Santa Catarina (Brasil); participaron 10 enfermeras. **Resultados.** Emergieron tres síntesis que guiaron la discusión: *Los retos de ser profesional de enfermería en la pandemia, El aprendizaje y el crecimiento que generaron los retos de la pandemia,* y *La enfermería como protagonista del cuidado*. A pesar de las limitaciones, el CCV fue un espacio que proporcionó una interacción social entre los participantes, con intercambio mutuo de experiencias, con muchas reflexiones, así como expresiones de sentimientos, vivencias y aprendizajes obtenidos durante la Pandemia de COVID-19. **Conclusión.** Las participantes perciben que, aunque el momento destaca y valora la profesión, están sobrecargados y agotados por la pandemia del COVID-19, lo cual ha tenido repercusiones en la vida profesional y personal. El cuidado para las personas que cuidan requiere planificarse y ser implementado en los diferentes escenarios. El Proceso de Enfermería, construido con base en los conocimientos teóricos y científicos, debe servir de guía para la mejora efectiva de la calidad de los cuidados de salud.

Descriptores: proceso de enfermería; salud laboral; COVID-19; atención hospitalaria.

Criando espaços de cuidados a enfermeiros atuantes na pandemia a luz do processo de enfermagem

Resumo

Objetivo. Dialogar sobre a percepção dos profissionais da enfermagem no que tange ao enfrentamento da COVID-19 e as repercussões em sua prática profissional e em sua vida pessoal. **Métodos.** Estudo qualitativo do tipo pesquisa ação participante, realizado por meio do Itinerário de Pesquisa de Paulo Freire atrelado às etapas do Processo de Enfermagem. Para tal, se lançou a seguinte pergunta norteadora: Como está sendo para você atuar como profissional da enfermagem na área hospitalar durante a pandemia de COVID-19? **Resultados.** Emergiram três sínteses que nortearam a discussão: Os desafios de ser profissional de enfermagem na pandemia. Os aprendizados e crescimentos que os desafios da pandemia geraram e A enfermagem como protagonista do cuidado. O Círculo de Cultura Virtual foi um espaço onde, apesar das limitações, proporcionou uma interação social entre as participantes, com trocas de experiências mútuas, com muitas reflexões, além de expressões de sentimentos, vivências e aprendizados obtidos durante a pandemia da COVID-19. **Conclusão.** Os enfermeiros perceberem que, embora o momento destaque e valorize a profissão, estão sobrecarregados e extenuados pela pandemia da COVID-19, que repercutiu em sua vida profissional e pessoal. O cuidado para quem cuida necessita ser planejado e implementado nos diferentes cenários, e o Processo de Enfermagem construído com base em conhecimentos teóricos e científicos, guia a efetiva melhoria da qualidade da assistência à saúde.

Descritores: processo de enfermagem; saúde do trabalhador; COVID-19; assistência hospitalar.

Introduction

On March 11, 2020, the World Health Organization (WHO) declared pandemic status for the SARS-CoV-2 virus, which causes COVID-19. Two years after this declaration, the pandemic status is maintained worldwide. Countless deaths have been recorded, containment measures have been advanced, and, in the meantime, the implementation of immunization and systematic testing have been conquered; nevertheless, new variants of the virus sustain the pandemic and multiply its dissemination.(1) Thus, throughout the time of coping with the pandemic, in order to mitigate and/or eradicate this disease, nursing professionals together with the entire health team have become protagonists in the care provided to patients suspected and infected with this virus, needing to learn to deal with various difficulties quickly and dynamically. Moreover, these professionals are challenged every day with long working hours, mental overload, distance from family members, as well as the large number of colleagues in the profession being removed and/or progressing to death. In Brazil, data reported by the Health System *Nursing Observatory*, released by the Federal Council, show a total of 872 deaths from March 20, 2020 to February 5, 2022.(2)

In this pandemic period, there was an increase in anxiety and stress symptoms among health professionals, besides a growing change in the way they live, work and organize themselves, which also generated feelings of helplessness and abandonment, associated with increased insecurity about the future. These professionals face many stressors, some of which are exposure to infection, fear of infecting others, fatigue from overwork and coexistence with fatal cases, which are also linked to frustration with the feeling that it is impossible to prevent deaths. For this reason, health-promoting initiatives must be immediate and continuous, aiming to provide emotional support to professionals, helping them in the adaptation process.(3) Thus, in a recent study by the Pan American Health Organization (PAHO) in conjunction with universities in Colombia and Chile, it was revealed that, throughout Latin America, about 14.7% to 22% of the interviewed professionals presented symptoms of depressive episodes.(4)

Mostly, nursing acts in different services, from reception to intensive care. The new scenario of physical and emotional exposure during work activities presents itself to nurses at exactly the moment when the international campaign *Nursing Now* emerges to promote their empowerment as protagonists in health production. Nurses revealed the power of Nursing as a voice that comes from scientific knowledge and experience. For them, the pandemic also represents an opportunity for the profession to empower itself through ethical attitudes, continuing education and political militancy, claiming its appreciation in the face of class entities and councils.(5)

This conjuncture imposes that nursing professionals working in the hospital area are challenged daily to face the high risk of contamination, the possibility of transmitting the disease to third parties and family members, as well as the scarcity of Personal Protective Equipment (PPE), being that, in 2020, the Federal Council of Nursing (COFEN) received approximately 3.6 thousand complaints about the lack, scarcity or poor quality of PPE.(6) In addition, one can mention the creation of many beds in a short period of time, the lack of training and the adaptation to the new care with the management of patients and staff. All this, together with the historical demands of the category that still perpetuate, such as the working conditions offered, the excessive workload, the sizing and lack of personnel, the remuneration, and, until then, the social visibility (7), which, despite having been appreciated in 2020, there is much to advance.

In addition, nursing professionals are faced with the ambivalence of what would be correct and incorrect in the care provided during the pandemic, where there are moments when it is necessary to decide who will die or live, due to the high number of hospitalizations and the lack of beds.(8) Furthermore, all these feelings and uncertainties are taken outside the hospital area, in their daily lives, the frustrations, anxieties, doubts and fears continue and are accentuated by the fact that people do not comply with the worldwide recommendations for preventing the disease, so that there is, at least, a reduction in the number of cases. Considering the above, it is of interest to know if the nursing professionals who experience this reality in their work process receive attention, are cared for in terms of their anxieties, fears and uncertainties, and are being heard and welcomed. These are questions that translate the justification for this study. Accordingly, it was proposed to create a space for care during the research using the Nursing Process (NP) methodology linked to Freire's Research Itinerary.

NP consists of a tool that enables nurses to put their knowledge into practice in an organized and qualified manner, constituting a methodological instrument, which is defined in five interrelated, interdependent and recurring steps, as follows: 1) Nursing data collection or Nursing History; 2) Nursing Diagnosis; 3) Nursing Planning; 4) Implementation; and 5) Nursing Assessment. (9) With this in mind, the objective of this study is to make a dialog about the nursing professionals' perception regarding how they cope with COVID-19 and the repercussions on their practice and personal life.

Methods

This is a qualitative study, typified as participatory action research, which was carried out through the Culture Circle (CC), whose theoretical construct was developed by Paulo Freire. During the study, it went through the steps of CC structured in the so-called research itinerary, as follows: 1) Generating Themes; 2) Coding and Decoding; and 3) Critical Unveiling.(10) At each step of the research itinerary, it was proposed to perform an alignment with the steps of NP, precisely to expose the care that was being offered to nursing professionals during CC. CCs are the spaces where meetings take place, where a group of people, with similar interests, discuss, dialog and reflect about their problems and life situations, based on the sharing of their experiences.(10)

In general, it is developed in person, but, in view of the need for social distance, due to the COVID-19 pandemic, it was decided to carry it out in a virtual way, through the Cisco Webex® online application, which enabled the active and simultaneous participation of nursing professionals who were invited to participate. In order to organize the Virtual Culture Circle (VCC), the researchers made an invitation via WhatsApp® available to nursing professionals from hospital institutions in Santa Catarina (Brazil). Of these, some professionals invited others within their institution, considering the Snowball sampling method.(11) Thus, the study was composed of 10 participating nursing professionals.

The inclusion criteria were nursing professionals working for one year or more in a hospital institution. VCC was held in May 2021, and the meeting time lasted a maximum of two hours, mediated by a nurse with a doctorate and experience in terms of conducting CC.

In the data collection system, methodologically, the investigation of the theme takes place initially, aiming to contemplate the first research step of the itinerary: the generating themes. This happens through a preliminary dialog where it becomes possible to identify these generating themes.(10) To that end, the following guiding question was launched: "How is it being for you to act as a nursing professional in the hospital area during the COVID-19 pandemic?". With the question launched, the participants were instructed to access the link of the Mentimeter® online application and respond to the question with meaningful words. From this dynamic in which the generating themes were chosen, the syntheses that guided the discussion emerged: "The challenges of being a nursing professional in the pandemic", "The learning and growth that the challenges of the pandemic have generated" and "Nursing as the protagonist of care". In alignment with the steps of NP, the ideas that represent the generating themes correspond to the moment when data collection is held.

Following the data collection systematics, the second step of the research itinerary was reached. Thus, when coding, the generating themes were discussed and contextualized with the participants and, from that, they began to gain meaning, i.e., the magical view was replaced by a critical and social view of the discussed theme. This action of making the initial vision more critical, sustained the decoding, that is, at this step, even if unconsciously, an analysis of the experienced situation. This coding and decoding movement makes participants start to admire and reflect on their actions, and perceive their ability to self-transform their world and overcome the limits imposed on their daily lives.(10) In the interface with NP, there is its second step, the Nursing Diagnosis, understanding coding codes as clinical signs and decoding as the clinical judgment made considering the clinical relationships of signs and symptoms expressed during the coding process. Subsequently, still in the second step of the itinerary, the participants were encouraged to give meaning to the moment through an image that conveyed the exposed feelings. From this, the auxiliary researchers went online in search of images with the listed ideas, which resulted in five images, and one of them was selected by the nursing professionals to represent them (Figure 1 presented in the results).

In the last step of application of the research itinerary, entering the Critical Unveiling, already touched by the reflections and the meaning of the image, the mediator posed the following questions: what has been learned from this? What can you take back to your professional life? What is it like to be a nurse after what you have experienced? How has what you experienced touched you and changed you? This last step made the participants reflect on their reality and see the possibilities and the positive points in the problems they experienced.(10) In the analogy with NP, the Critical Unveiling is the moment in which care is planned and then implemented, that is, respectively the third and fourth steps of NP.

As far as data analysis is concerned, the transcription of the participants' speeches and the analysis of the generating themes were carried out concomitantly with the development of VCC, together with the participants, since the Research Itinerary foresees an analytical process that must happen continuously and with the participation of everyone involved.(10) As a final act, the mediator invited the group to express feelings about the participation in VCC, which represents the fifth step of NP, the assessment. This was developed with the participants about the results obtained in the space for care, considering the research proposal, which was to promote care to nursing professionals. Then, the video of a song called "Laços - Homenagem aos profissionais da saúde", composed by Gabriel Moura and performed by Nando Reis and Ana Vilela, available on the YouTube® platform, was played as a way of honoring and thanking the important work done by these nursing professionals. The dialogs of VCC were recorded and transcribed; and, for the analysis, the dialog originated in the generating themes was read and reread. It is also explained that the participants' speeches were identified by referring to nursing theorists, aiming to honor these professionals who contributed to the structuring of science in nursing. Accordingly, the following codenames were used: Florence Nightingale, Anna Nery, Wanda Horta, Dorothea Orem, Lydia Hall, Mother Marie Domineuc, Olga Verderese, Imogene King, Edith de Magalhães Fraenkel and Mary Seacole.(12)

The research was approved by the Ethics Committee, with opinion number 4.068.387 in 2020. The Free and Informed Consent Form (FICF) was sent via Google Forms® on the day of VCC, and the participants' anonymity was preserved by codenames as already mentioned.

Results

The participants were women, ages ranging from 29 to 47 years, with 1 to 17 years of experience in the hospital area, 7 working in public institutions and 3 in private ones. Of these, 3 worked in the COVID-19 ICU and the others can be seen in Table 1.

Following the presentation of the sociodemographic profile of the participants, the results from the data collection related to the steps of the research itinerary are presented.

Thus, the production of the generating themes triggered from the guiding question described in the method generated a "cloud of ideas", expressed in words organized in Table 2.

This cloud of ideas allowed the researchers to access the second step of the research itinerary, that is, the coding and decoding. Accordingly, the discussion among the participants allowed to codify the generating themes and, in the deepening of this discussion, to decode them. This process is also demonstrated in Table 2.

The following are the speeches of the participants that express the syntheses established in the walk through the itinerary involving the first and second steps of this research itinerary.

The challenges of being a nursing professional in the pandemic

*I think that, for everyone, for all the health areas involved, it was hard, in the emotional sense (*Florence Nightingale*); It really gets to a point of exhaustion, I think it's good that it decreased, the teams were already very exhausted, we perceived that we couldn't hold it, we couldn't deal with so much sadness, so much loss* (Anna Nery)*; Therefore, it also shakes us emotionally, it's heavy, it's hard because we are not trained for these moments of loss, of mourning, these more [...] challenging moments* (Wanda Horta)*; There were several deaths during the day, the gratitude of being there, with your family well, of being able to be healthy, of being able to develop more, this was very strong for me* (Dorothea Orem); *Uncertainty, because it was an uncertain disease, there were uncertain treatments, the uncertainty of how my shift will be today* (Lydia Hall).

The learning and growth that the challenges of the pandemic have generated

To do our best in the beginning, so that, after that, we could reorganize the service, make care

Table 1. Participants' characteristics

Name	Age	Type of institution	Years working in the hospital environment	Hospital facility
Florence Nightingale	42	Public	17	Maternity and Clinical Neonatology
Anna Nery	35	Private	14	Hemodynamics
Wanda Horta	29	Public	2.5	COVID-19 Infirmary
Dorothea Orem	42	Public	7	Nursing Audit
Lydia Hall	30	Private	6	Emergency/First-Aid Room
Madre Marie Domineuc	31	Public	7.25	COVID-19 ICU
Olga Verderese	30	Public	1.25	COVID-19 ICU
Imogene King	47	Public	12	COVID-19 ICU
Edith de Magalhães Fraenkel	32	Private	5	Emergency/First-Aid Room
Mary Seacole	39	Public	10	General ICU

Table 2. Generating themes, coding and decoding

Generating themes	Coding	Decoding
Challenging Challenge Learning Knowledge Fear Adaptation Gratifying Uncertainty Caution Resilience Appreciation Study Courage Reassess Altruism Overcoming Team Exhaustion Growth Organization Strength Anguish Emotional health Focus Dressing Emotional control Losses Fatigue Union	The pandemic generated uncertainty, exhaustion, losses, anguish and fear.	The challenges of being a nursing professional in the pandemic.
	The pandemic provided the opportunity for resilience, teamwork, appreciation of the dressing, development of emotional control, overcoming, altruism and the will to learn.	The learning and growth that the challenges of the pandemic have generated.
	The pandemic provided the appreciation of nursing, the union among professionals, the organization of work, the feeling of courage and strength, professional gratitude and empowerment.	Nursing as the protagonist of care.

flows, and also encourage the teams, so I think it was a learning process from several points of view, technical and scientific (Florence Nightingale)*; Learning because not only negative things came with the COVID, since we started to learn more, to seek more, in order to see what would be the best way of serving these patients* (Mother Marie Domineuc)*; We needed to go study, go after, know ourselves again, reassess ourselves, assess the team* (Lydia Hall)*; I made an effort to manage, I think that there is no professional that, at this moment, did not test, know or overcome his/her limits* (Olga Verderese)*; Therefore, we had to learn very quickly and adapt nursing care to everything we learned in college during our practice, clinical technique* (Florence Nightingale)*; We're able to work as a team, each one with his/her own field of action, physiotherapist, psychologist, nutritionist, intensivist and nurse, so I think we strengthened the roles and competences a lot* (Mother Marie Domineuc)*; The union of the multidisciplinary team is a remarkable thing, I didn't see this before the COVID in an intra-hospital environment* (Anna Nery)*.*

Nursing as the protagonist of care

We have been empowered in our profession with this pandemic (Florence Nightingale)*; We think about reorganizing the sector, reorganizing the hospital, so I think our vision goes far beyond, we can empower ourselves in our role as nurses* (Florence Nightingale)*; The nurse has certainly been strengthened as a manager because, all the time, it required a new adaptation, a new planning, from scientific knowledge to assistance and management* (Anna Nery); *Nursing as the protagonist of care, the leadership, because we're leaders of this care* (Florence Nightingale); *Nursing is a science that thinks about care, that plans care and that makes a whole movement of a multidisciplinary team* (Florence Nightingale); *Everyone working as equals was a difficulty and today I see that this has strengthened a lot, each one knowing the value of each profession and nursing as never before* (Anna Nery).

Moreover, in the presentation of the results, the evidence of the third step of the research itinerary is shown, the critical unveiling. In this step, the participants expressed the care developed in this period of the pandemic as differentiated, and the speech below demonstrates these perceptions.

I think altruism is that unselfish care, not selfish, at that moment I was as a nurse, I was exercising care as a profession, but I also needed to go beyond (Wanda Horta); *Then, when there was this second wave that was now this year, it was an even greater challenge, of various uncertainties too, a lot of strength, empathy, altruism (*Lydia Hall).

Finally, the participants' speeches that reveal the moment of assessment of VCC are highlighted:

I found it very welcoming and I identified with several of the speeches (Mother Marie Domineuc)*; I think these moments are unique, because we end up in our daily routine and, within our institution, we don't have time for this, and it was nice to hear the other fellows* (Florence Nightingale)*; It was a very welcoming moment, a chat, I would even say a refreshment for us* (Olga Verderese)*; I think these moments really strengthen us as professionals and as a profession. (*Anna Nery).

The following image is the expression of the meaning of the pandemic in practice and in the personal lives of nursing professionals, who, when participating in VCC, were able to talk and make a dialog about their perceptions. As described in the method, this is the result of an internet search for a better representation of this moment. When visualizing nursing professionals dressed and embracing, the participants selected this image as representative of their experiences in the pandemic period.

Figure 1. Image selected by the participants through an internet search during data collection, giving meaning to their perceptions about their professional activities during the pandemic.

Photo 1. Nurse's Day(13)

Discussion

As the researchers went through the phases of Freire's Research Itinerary, they correlated them with the steps of the Nursing Process (NP) based on the assumption that, in action research, one intervenes in the health reality of a given population or individual, just as nurses do when developing NP. The literature points out the relevance of using this research method whose object of study is NP. Thus, in an action research proposal in which the objective was to give new meaning to the knowledge of nurses from a hospital about NP, the importance of using this approach, in terms of its interventional character, was evidenced in the researched scenario. Firstly, it was shown how the strategy favored the detection of difficulties related to the application of NP in care practice and, subsequently, contributed to the development of the participants' knowledge and skills in relation to NP, aiming to optimize its implementation in the health institution.(14)

Accordingly, when combining the investigation of Generating Themes with the first step of NP, i.e., data collection, the interface with the second step of NP is followed through decoding. In this sense, it should highlight the Nursing Diagnoses (ND) whose clinical judgment allowed to list from the evidence that was organized by considering the coding and decoding procedures of VCC. In the same way that in the decoding step it is possible to reflect on the situation presented and how it is theoretically supported, leading to a broadening of understanding and the elaboration of a synthesis of ideas, in the step of clinical judgment (referring to the step of NP related to diagnosis identification), an analysis is made of the real health conditions that are being assessed and, from these characteristics, the clinical analysis sustained on scientific bases is undertaken, which allows materializing the diagnostic idea.(10,15) Therefore, "the challenges of being a nursing professional in the pandemic", one of the decoding steps worked on, were translated from the following diagnostic statement extracted from the taxonomy *North American Nursing Diagnosis Association International* (NANDA-I): 1) Stress overload related to repeated stressors characterized by impaired emotional health, negative impact of losses, exhaustion, insecurity. From a conceptual point of view, this diagnosis has the following meaning: Excessive amounts and types of demands that require action.(15)

Nevertheless, outlining considerations about the identification of this ND among the group of nurses participating in the research, which demonstrates their stress overload experienced in the face of the pandemic, it is conjectured that this stress overload in an early form was perceived in the daily lives of health professionals, especially nurses, which consists of the largest quantity of work force in this field of social action.(5) In this sense, it is discussed that anxiety, fear and insecurity surround events of this nature, and it is factual that, historically, this reality has already been experienced in similar situations. Therefore, considering the unique repercussion of this pandemic, one can revisit scientific productions whose evidence points to the psychological support to be offered in these health contexts.(16) Worldwide mental health proposals are designed to help this group of professionals who are vulnerable.(16) in this perspective, it is mentioned relevant actions of the Brazilian Ministry of Health structured based on Telemedicine and Telehealth resources, through which a teleconsultation channel is available for COVID-19 (TeleSUS) and the psychological teleconsultation service (TelePsi) for health professionals who work in the care of patients with coronavirus.(17) Furthermore, psychological support has been offered, involving psycho-educational actions by means of informative materials in physical form, or even online, using various communication platforms, as well as the services of volunteer psychology professionals, either online or in person, in university hospitals in many regions of Brazil.(18) Thus, the space for dialog that was provided to the nursing professionals participating in the study in VCC allowed the exposure of their concerns regarding the work activity around the pandemic, enabling relief from stressors by considering that, in conducting groups, communication, exchange and sharing help therapeutically(5).

As for the decoding: "The learning and growth that the challenges of the pandemic have generated", it was judged that this health phenomenon is conveyed by the idea conceived in the NANDA-I diagnosis: 2) Disposition for improved coping characterized by the search for overcoming through study, ability to focus, adapt, reassess and being resilient. In NANDA-I, the concept of this ND is: pattern of valid appraisal of stressors, with cognitive and/or behavioral efforts, to control demands related to well-being, which can be improved.(19) It is debated that personal and professional growth in the work processes confers a desirable status regarding the development of skills that are required for a profession. In this sense, resilience is the necessary attribute that enables the achievement of adaptations, reformulations and re-significations in the work context. The participants of this study recognized the difficulties they called challenges and processed them aiming at the best result from the new demands.(19) It is consensual that, when there are adversities in the world of work, in order to face them healthily, it is fundamental for the emotional balance to be equalized to exercise resilience,(20) which was a noticeable movement mentioned in the research in question.

Finally, the decoding that extols "Nursing as the protagonist of care" presented characteristics that allowed diagnosing based on NANDA-I for the study participants: 3) Disposition for improved self-concept characterized by self-confidence in professional abilities and satisfaction with the sense of appreciation. In the taxonomy in question, this means the pattern of perceptions or ideas about oneself that can be improved.(19) The appreciation of nursing was never more evident than during the pandemic, where nurses were agile in making decisions based on scientific evidence and global recommendations for the restructuring of services, so that it was possible to meet the new health demand. Undeniably, they played a leading role in the situation of COVID-19 in all dimensions of care, assistance, management, politics, research and education. They composed work committees, planned the operation and physical structures to provide care, people management, the creation of protocols and care flows, and also acted directly in the care process.(21) In this vein, from the defining characteristics that were inscribed in the identified diagnosis showing the willingness to improve the self-concept of the professionals participating in the research, it was clear how much they felt appreciated in their knowledge and performance in the pandemic context in their workplace.

In the sequence, considering the phases of the Research Itinerary, the critical unveiling follows when researchers and participants dialogically construct propositions from the expanded critical consciousness provided by the previous phases. To that end, following the interconnection established in this discussion, with the steps of NP, the 3rd step is reached, that is, planning, a moment in which the nurse makes clear the desired results and the nursing interventions that have the potential to respond to the results. Therefore, considering the listed ND, the next step is the identification of nursing outcomes that are formulated in the development of clinical reasoning that takes place in the sequence of steps of NP. Thus, these should configure responses to correlated health phenomena. For such selection, the taxonomy of the Nursing Outcomes Classification (NOC) was used.(22) The chosen nursing diagnoses, 1) Stress overload, 2) Enhanced coping disposition and 3) Enhanced self-concept disposition refer to the following nursing outcome goals to be achieved: 1) Stress level, 2) Coping, 3) Self-esteem and quality of life. Given these goals, interventions were extracted from the taxonomy of the Nursing Interventions Classification (NIC),(23) thus highlighting that the following interventions emerge as possibilities of action for nursing in the face of the diagnoses identified in research group of VCC: emotional support and support group, aiming to obtain responses to health phenomena captured in the course of the Research Itinerary.

In a study carried out in the Federal District in a Primary Health Care Unit, a psychology researcher structured a group with the purpose of providing an opportunity for listening, welcoming and expressing the feelings experienced by PHCU professionals during the pandemic. The experience report reveals that three meetings were held; however, the proposal is of a continuous nature, as long as it is necessary.(24) Another experience found in the literature, developed by the Pernambuco Regional Council in partnership with the Federal Nursing Council, shows that, sensitized by the situation of nursing workers, they created the Nursing Care Network, a service that provides free psychological care remotely and guidance for integrative and complementary practices in health, with the potential to help reduce stress and overcome the numerous challenges that trigger suffering of all kinds.(25)

From this perspective, involved as they were in the dialog group provided by VCC, which promoted emotional support, the participants understand that one of the great meanings of the pandemic was to allow the professional to develop a nursing care permeated by attributes such as empathy, love and solidarity, and also made them think again about the purpose of the profession, rediscovering the pleasure in being a health professional in the field of nursing, because it is gratifying to take care of human life. These feelings are uniquely reflected in their choice of image, which makes clear the strength, unity and affection in the face of the pandemic.

In this context, it is problematized that the health crisis brings ethical and humanitarian principles to the surface, thus enabling the discussion of the conceptions imbricated in the National Humanization Policy (NHP). The participants of this study extol attributes of NHP, instigated at the core of the scenario they experience. It is agreed that in situations of conflict character, whose scope is social, in this case worldwide, humanization principles are indispensable, walking towards the union of forces. Therefore, the establishment of a model of comprehensive care, based on an inter and multidisciplinary praxis should be strengthened in all levels of complexity of health care, resulting in a decrease of the biopsychosocial impact on individuals and communities.(26) When finishing the assessment of the activity, they demonstrate that the results were achieved by expressing the opportunity as a welcoming one that allows exchanges and strengthening.

As limitations of this study, it is presented that VCC used as a space for care combined with NP proved to be promising, but, despite the positive perception, it is relevant to highlight that the study reached a small number of professionals who were reached with a nursing intervention whose character was resolute, i.e., the formation of the group itself and the achieved emotional support. Naturally, when such an approach is proposed to larger groups, there is a risk of losing the welcoming essence, and it is because of this that it is important to replicate these support groups aiming to broaden their therapeutic scope.

It is concluded that VCC reveals itself as a research and learning tool configured as a space, where, despite the limitations, it provided a social interaction among the participants, with mutual exchange of experiences, with many reflections, besides expressions of feelings, experiences and learning obtained during the COVID-19 pandemic. The participants felt welcomed during the time of VCC and had positive feedbacks. The interface developed between the steps of Paulo Freire's Research Itinerary with the steps of NP strengthened the initiative to create spaces for welcoming and listening, aiming at emotional support for nursing professionals. The application of NP made it possible to know the reality experienced by nurses working in the pandemic, making them express their perceptions that were captured as health phenomena, i.e., the defining characteristics of the selected nursing diagnoses, as well as the selection of outcomes and interventions. This dynamic attached to an action research allowed the researchers to jointly research and intervene, reaching the goals set in the application of the steps of NP, thus making it possible to visualize the application of all steps of NP.

Despite the fact that this moment highlights and appreciates the profession, nursing professionals are overloaded and exhausted by the COVID-19 pandemic, with repercussions on professional and personal life. The care for those who care needs to be planned and implemented in different scenarios, and NP built based on theoretical and scientific knowledge guide the effective improvement of the quality of health care.

References

1. Souza JB, Potrich T, Bitencourt JVOV, Madureira VSF, Heidemann ITSB, Menegolla GCSc. COVID-19 vaccination campaign: dialogues with nurses working in Primary Health Care. Rev. Esc. Enferm. USP. 2021; 55:e20210193.
2. Conselho Federal de Enfermagem. Observatório da Enfermagem. Profissionais infectados com COVID-19 informado pelo serviço de saúde [Internet]. Brasília (DF): Ministério da Saúde; 2021 [cited 5 Feb 2022]. Available from: http://observatoriodaenfermagem.cofen.gov.br/

3. Pereira ACC, Pereira MMA, Silva BLL, Freitas CM de, Cruz CS, David DBM, et al. O agravamento dos transtornos de ansiedade em profissionais de saúde no contexto da pandemia da COVID-19. Braz. J. Health Rev. 2021; 4(2):4094-410.
4. Organização Pan-Americana da Saúde. Estudo alerta para altos níveis de depressão e pensamentos suicidas em trabalhadores de saúde na América Latina durante a pandemia. Brasília (DF) [Internet]; 2022 [cited 5 Feb 2022]. Available from: https://www.paho.org/pt/noticias/13-1-2022-estudo-alerta-para-altos-niveis-depressao-e-pensamentos-suicidas-em#:~:text=O%20relat%C3%B3rio%20COVID%2D19%20Health,que%20pensaram%20em%20cometer%20suic%C3%ADdio.
5. Souza JB, Vendruscolo C, Maestri E, Bitencourt JVOV, Brum CN, Luzardo AR Círculo de cultura virtual: promovendo a saúde de enfermeiros no enfrentamento da covid-19 Rev. Gaúcha Enferm. 2021; 42(esp):e20200158.
6. Oliveira AC. Desafios da enfermagem frente ao enfrentamento da pandemia da COVID19. Rev. Min. Enferm. 2020; 24:e1302.
7. Souza NVD de, Carvalho EC,Soares SSS, Varella CMYM, Pereira SRM, Andrade KBS de. Trabalho de enfermagem na pandemia da covid-19 e repercussões para a saúde mental dos trabalhadores. Rev. Gaúcha Enferm. 2021; 42(esp):e20200225.
8. Costa DM. Os Desafios do Profissional de Enfermagem Mediante a COVID-19. Gestão e Tecnologia Faculdade Delta. 2020; 1:e-30.
9. Conselho Federal de Enfermagem. Resolução nº 358 de 15 de outubro de 2009. Dispõe sobre a Sistematização da Assistência de Enfermagem e a implementação do Processo de Enfermagem. Brasília (DF): Ministério da Saúde 2009. [cited 20 Jul 2021]. Available from: http://www.cofen.gov.br/resoluo-cofen-3582009_4384.html
10. Heidemann ITSB, Dalmolin IS, Rumor PCF, Cypriano CC, Costa MFBNA, Durand MK. Reflections on paulo freire's research itinerary: contributions to health. Texto Contexto Enferm. 2017; 26(4): e0680017
11. Naderifar M, Goli H, Ghaljaie F. Snowball Sampling: A Purposeful Method of Sampling in Qualitative Research. Strides Dev. Med. Educ. 2017; 14(3):e67670.
12. Comissão Nacional de Ética em Pesquisa. Ofício circular nº 2, de 24 de fevereiro de 2021. Orienta para procedimentos em pesquisas com qualquer etapa em ambiente virtual [Internet]. Brasília (DF): Ministério da Saúde 2021. [cited 20 Jul 2021]. Available from: http://conselho.saude.gov.br/images/Oficio_Circular_2_24fev2021.pdf
13. Dia do Enfermeiro: Neste sábado haverá uma homenagem à linha de frente na batalha contra o vírus [Internet]. Interesse geral. Rio Grande, Argentina. Tempo fueguino. 19 de novembro de 2020 [cited 09 Fev 2022]. Available from: https://www.tiempofueguino.com/dia-del-enfermero-este-sabado-habra-un-homenaje-a-la-primera-linea-en-la-batalla-contra-el-virus/
14. Ribeiro RV, Fausto FN, Benites PT, Corona ARP del, Ribeiro VS. A pesquisa-ação na reconstrução do conhecimento de enfermeiros sobre processo de enfermagem na área hospitalar. New Trends Qual. Res. 2020; 3:423–436.
15. Herdman HT, Kamitsuru S, Lopes CT. Diagnósticos de enfermagem da NANDA-I: definições e classificação 2021-2023. 12. ed. Nova Iorque: Thieme Medical Publishers; 2021.
16. Schmidt B, Crepaldi MA, Bolze SDA, Neiva-Silva L, Demenech LM. Saúde mental e intervenções psicológicas diante da pandemia do novo coronavírus (COVID-19). Estud. Psicol. 2020; 37:e200063.
17. Brasil. Ministério da Saúde. Profissionais do SUS já podem contar com suporte psicológico [Internet]. Brasília (DF): Ministério da Saúde 2020 [cited 28 Jun 2021]. Available from: https://www.saude.gov.br/noticias/agencia-saude/46906-profissionais-do-sus-ja-podem-contar-com-suporte-psicologico
18. Fundação Oswaldo Cruz. Saúde mental e atenção psicossocial na pandemia COVID-19: recomendações para gestores [Internet]. Brasília (DF): FIOCRUZ 2020 [cited 28 Jun 2021]. Available from: https://www.fiocruzbrasilia.fiocruz.br/wp-content/uploads/2020/04/Sa%c3%bade-Mental-e-Aten%c3%a7%c3%a3o-Psicossocial-na-Pandemia-Covid-19-recomenda%c3%a7%c3%b5es-gerais.pdf
19. Brolese DF, Lessa G, Santos JLG, Mendes JDS, Cunha KSD, Rodrigues J. Resilience of the health team in caring for people with mental disorders in a psychiatric hospital. Rev. Esc. Enferm USP. 2017; 51:e03230.
20. Luana LRS, Gonçalves JLC, Láscari MPS, Nunes TP. Análisis de los componentes que influyen en el procesamiento seguro de la cajuína desde la perspectiva del APPCC: una revisión. Res. Soc. Develop. 2020; 9(11):e159119493
21. Bitencourt JVOV, Meschial WC, Frizon G, Biffi P, Souza JB, Maestri E. Protagonismo do enfermeiro na estruturação e gestão de uma unidade específica para COVID-19. Texto Contexto Enferm. 2020; 29:e20200213.

22. Moorhead S, Johnson M, Maas ML, Swanson E. Classificação dos resultados de enfermagem (NOC). 4. ed. Rio de Janeiro: Elsevier; 2008.
23. Bulechek GM, Butcher HK, Dochterman JM, Wagner CM. Classificação das Intervenções de Enfermagem (NIC). 6. ed. Rio de Janeiro: Elsevier; 2016.
24. Andrade CEBM, Moura MG. Grupo de Saúde Mental com Servidores de uma UBS do Distrito Federal, durante a pandemia por COVID-19: relato de experiência. Health Residencies J. 2020; 1(4):1-10.
25. Conselho Federal de Enfermagem. Conselho Regional de Enfermagem Pernambuco. Criada rede de apoio para cuidar dos profissionais de enfermagem na pandemia. Brasília (DF): Ministério da Saúde 2020. [cited 5 Feb 2022]. Available from: http://www.cofen.gov.br/criada-rede-de-apoio-para-cuidar-dos-profissionais-de-enfermagem-na-pandemia_79223.html
26. Sánchez EG. Humanizar la muerte en tiempos de crisis sanitaria: morir acompañado, despedirse y recibir atención espiritual. Cuad. Bioét. 2020; 31(102):203-22.

Characteristics, treatment, and nursing care of patients infected by Sars-CoV-2 hospitalized in intensive care units: multicenter study of colombian hospitals

Original article

Olga L. Cortés[1,11]
https://orcid.org/0000-0002-9023-747 9
María del Pilar Paipa[2,11]
https://orcid.org/0000-0001-9222-6266
Carolina Mojica[3,11]
https://orcid.org/0000-0001-8874-8221
Yudy A. Rojas[4,11]
https://orcid.org/0000-0002-5939-3457
Sandra Pulido[5,12]
https://orcid.org/0000-0002-7512-0010
Martha Arias[6,12]
https://orcid.org/0000-0001-7065-8746
Maribel Esparza[7,13]
https://orcid.org/0000-0003-0149-2572
Natalia Martínez[8,13]
https://orcid.org/0000-0001-7980-0534
Skarlet M. Vasquez[9]
https://orcid.org/0000-0003-2552-9819
Indira Arevalo[10]
https://orcid.org/0000-0003-0806-5936

[1] RN, Ph.D.
Email: ocortes@cardioinfantil.org.
Corresponding author.
[2] Nurse, Specialist.
Email: mpaipa@cardioinfantil.org
[3] Nurse.
Email: t-cmojica@cardioinfantil.org
[4] Nurse, Specialist.
Email: jrojas@cardioinfantil.org
[5] Nurse, M.Sc.
Email: nursing.liderdp@hus.org.co
[6] Nurse, M.Sc.
Email: hospitalizacion.pyp@hus.org.co
[7] Nurse, M.Sc.
Email: maribel.esparza@foscal.com.co
[8] Nurse. Email: natalia.martinez@foscal.com.co
[9] Nurse, M.Sc. Autonomous University of Bucaramanga, Colombia. Email: svasquez196@unab.edu.co
[10] Nurse, Master's student. La Sabana University Clinic, Chia, Colombia. Email: indira.arevalo@clinicaunisabana.edu.co
[11] Fundación Cardioinfantil Instituto de Cardiología, Bogotá, Colombia.
[12] Hospital Universitario de la Samaritana, Bogotá, Colombia.
[13] FOSCAL Clinic, Bucaramanga, Colombia.

Conflicts of interest: None.

Receipt: July 13, 2021.

Approved: March 3 2022.

How to cite this article: Cortés OL, Paipa MP, Mojica C, Rojas J, Pulido S, Arias M, et al. Characteristics, treatment, and nursing care of patients infected by SARS-CoV-2 hospitalized in intensive care units: Multicenter study of Colombian hospitals. Invest. Educ. Enferm. 2021; 40(1):e08.

DOI: https://doi.org/10.17533/udea.iee.v40n1e08.

Characteristics, treatment, and nursing care of patients infected by SARS-CoV-2 hospitalized in intensive care units: Multicenter study of Colombian hospitals

Abstract

Objective. To describe the clinical characteristics, treatment, evolution, and nursing care of adult patients with severe acute respiratory distress syndrome who were positive for SARS-CoV-2 and hospitalized in intensive care units (ICUs) during the first peak of the pandemic in Colombia, 2020. **Methods.** Multicenter descriptive study of four high-complexity hospitals in Colombia, which included 473 consecutive adult patients admitted to intensive care units with a confirmed diagnosis of SARS CoV-2. Sociodemographic and clinical information - comorbidities, treatment and evolution - and nursing care provided were included. **Results.** Of the patients included, 43.7% died, 88.8% had pneumonia, and 60.2% developed respiratory distress syndrome. Most of those who died were men. Those who died had a median age of 68.4 years and a higher frequency of comorbidities (hypertension, cardiovascular disease, chronic obstructive pulmonary disease, and higher body mass index). They were admitted to the ICU with higher rate of dyspnea, lower oxygen saturation, and higher score of multiorgan failure. They also more often required mechanical ventilation and pronation therapy and were given more vasopressors and renal replacement therapy. **Conclusion.** People with severe acute respiratory distress syndrome due to COVID-19 who were hospitalized in the ICU had a high risk of death, especially older patients; males; those with cardiovascular, respiratory, and hypertension comorbidities; those who needed mechanical ventilation; and those with an elevated SOFA score. The nursing care of these critically ill patients focused on respiratory care and the prevention of associated complications.

Descriptors: COVID-19; Critical Care; Nursing Care.

Características, tratamiento y cuidados de enfermería de pacientes infectados por SARS-CoV-2 hospitalizados en unidades de cuidados intensivos: estudio multicéntrico de hospitales colombianos

Resumen

Objetivo. Describir las características clínicas, tratamiento, evolución y cuidados de enfermería de los pacientes adultos con síndrome de dificultad respiratoria aguda grave, positivos para SARS-CoV-2, hospitalizados en Unidades de Cuidados Intensivos (UCI) durante el primer pico de pandemia en Colombia en 2020. **Métodos.** Estudio descriptivo multicéntrico con la participación de cuatro hospitales de alto nivel de complejidad en Colombia, que incluyó 473 pacientes adultos, admitidos de forma consecutiva en unidades de cuidados intensivos –UCI-, con diagnóstico confirmado para SARS CoV-2. Se incluyó información sociodemográfica, clínica, comorbilidades, tratamiento y evolución, además de los cuidados de enfermería brindados. **Resultados.** Del total de pacientes incluidos fallecieron el 43.7%, presentaron neumonía el 88.8% y un 60.2% desarrollaron síndrome de dificultad respiratoria. Las personas que fallecieron en su mayoría fueron hombres, con una mediana de edad de 68.4 años, con mayor frecuencia de comorbilidades (hipertensión, enfermedad cardiovascular, enfermedad pulmonar obstructiva crónica y mayor índice de masa corporal); además ingresaron a UCI con mayor presencia de disnea, menor saturación de oxígeno, y con puntaje mayor de falla multiorgánica. Así mismo, requirieron con más frecuencia de ventilación mecánica, terapia de pronación, uso de vasopresores y terapia de reemplazo renal. Los cuidados de enfermería de estos pacientes en estado crítico se enfocaron al cuidado respiratorio y la prevención de complicaciones asociadas. **Conclusión.** Las personas con síndrome de dificultad respiratoria aguda grave por COVID-19 que se hospitalizaron en UCI tuvieron un riesgo elevado de fallecer, especialmente los pacientes de mayor edad, sexo masculino y con comorbilidades cardiovasculares, respiratorias e hipertensión arterial, uso de ventilación mecánica y un puntaje puntaje de SOFA elevado. Los cuidados de enfermería de estos pacientes en estado crítico se enfocaron al cuidado respiratorio y la prevención de complicaciones asociadas.

Descriptores: COVID-19; Cuidados Críticos; Atención de Enfermería.

Características, tratamento e cuidados de enfermagem de pacientes infectados por SARS-CoV-2 hospitalizados em unidades de tratamento intensivos: estudo multicêntrico de hospitais colombianos

Resumo

Objetivo. Descrever as características clínicas, tratamento, evolução e cuidados de enfermagem dos pacientes adultos com síndrome de dificuldade respiratória aguda grave, positivos para SARS-CoV-2, hospitalizados nas Unidades de tratamentos Intensivos (UTI) durante o primeiro pico de pandemia na Colômbia em 2020. **Métodos.** Estudo descritivo multicêntrico com a participação de quatro hospitais de alto nível de complexidade na Colômbia, que incluiu 473 pacientes adultos, admitidos de forma consecutiva nas unidades de tratamentos intensivos –UTI-, com diagnóstico confirmado para SARS CoV-2. Se incluiu informação sociodemográfica, clínica, comorbilidades, tratamento e evolução, além dos cuidados de enfermagens brindados**. Resultados.** Do total de pacientes incluídos faleceram 43.7%, apresentaram pneumonia 88.8% e um 60.2% desenvolveram síndrome de dificuldade respiratória. As pessoas que faleceram em sua maioria foram homens, com uma média de idade de 68.4 anos, com maior frequência de comorbilidades (hipertensão, doença cardiovascular, doença pulmonar obstrutiva crónica e maior índice de massa corporal); ademais ingressaram a UTI com maior presença de dispneia, menor saturação de oxigeno, e com pontuação maior de falha multiorgânica. Assim mesmo, requereram com mais frequência de ventilação mecânica, terapia de pronação, uso de vasopressores e terapia de substituição renal. Os cuidados de enfermagem destes pacientes em estado crítico se enfocaram ao cuidado respiratório e a prevenção de complicações associadas. **Conclusão.** As pessoas com síndrome de dificuldade respiratória aguda grave por COVID-19 que se hospitalizaram em UTI tinham um elevado risco de morte, especialmente os pacientes mais velhos; os homens; aqueles com comorbilidades cardiovasculares, respiratórias e hipertensão; aqueles que precisavam de ventilação mecânica; e aqueles com um escore SOFA elevado. Os cuidados de enfermagem destes pacientes criticamente doentes concentraram-se nos cuidados respiratórios e na prevenção de complicações associadas.

Descritores: COVID-19; Cuidados Críticos; Cuidados de Enfermagem

Introduction

In March 2020, the World Health Organization (WHO) announced a new global outbreak of pneumonia caused by a virus belonging to the family of coronaviruses, which was associated with the development of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).(1) This was detected for the first time in Wuhan, China, causing coronavirus disease 2019 (COVID-19), and from its initial detection until January 2022, more than 386.6 million infections worldwide have been confirmed, 306.4 million of which patients recovered and 5.72 million died.(2,3) In Colombia as of January 28, 2022, a total of 5.91 million cases had been confirmed, and a total of 134,781 of those had led to death (5.62 million recovered).(4)

SARS-CoV-2 infects the lower respiratory tract by binding to angiotensin-converting enzyme 2 (ACE2) in alveolar epithelial cells. This activates an immune response with increased secretion of inflammatory cytokines and chemokines in pulmonary vascular endothelial cells,(5) leading to diffuse alveolar damage with edema and necrosis of alveolar and endothelial cells and a rapid deterioration of oxygenation, which characterizes acute respiratory distress syndrome (ARDS).(6) Patients with more severe disease may develop shock at onset and ARDS requiring admission to the intensive care unit (ICU) for hemodynamic management of shock, mechanical ventilation, antibiotic therapy and other rescue measures.(7-11) The time between the onset of symptoms and the onset of dyspnea has been an average of 5 days, to hospital admission of 7 days, and to the appearance of ARDS of 8 days.(7,8) The particular characteristics of some markers of multiorgan failure show changes in laboratory values, such as lymphopenia and elevated liver enzymes, lactate dehydrogenase, inflammatory markers (e.g., C-reactive protein, ferritin), D-dimer (>1 mcg/mL), procalcitonin, prothrombin time (PT), troponin, and creatine phosphokinase.(7-11)

Disease progression is observed much more frequently in patients at high risk for severe disease and death, such as in individuals aged ≥ 60 years and patients with comorbidities such as hypertension, cardiovascular disease, chronic respiratory disease, diabetes, and cancer.(8,12) The time between the onset of symptoms and death is estimated at 17.8 days (95% CI = 6.9-19.2), and the time to discharge is 24.7 days (95% CI = 22.9-28.1). In patients confirmed with a laboratory-confirmed diagnosis of COVID-19 in China (n = 70,117 cases), a case fatality rate of 3.67% (95% CI = 3.56-3.80) was estimated. Worldwide, the death rate has been equivalent to 1.4% (95% CI = 0.4-3.5) in patients younger than 60 years and to 4.5% (95% CI = 1.8-11.1) in patients aged 60-65 years or older.(4) The general estimate of the fatality rate for this infection in China was 0.66% (95% CI = 0.39-1.33), which increased with age.(11,13)

Intensive-care nurses provide specialized care and have a high level of risk that is accentuated when caring for patients with COVID-19.(14) The care patterns and care interventions of these professionals are organized according to the needs or problems identified for each patient. Among the different activities are the hourly evaluation of the general state of each patient and the structuring of changes to the care plan according to individual needs. The interventions must be more complex in patients with ARDS-COVID-19 and are oriented toward improving the ventilation/perfusion ratio through the use and control of parameters in mechanical ventilation and the implementation of interventions such as prone position and delivering related care when oxygenation with extracorporeal therapy is needed. Other interventions are designed to reduce complications, improve well-being, and improve patient survival.(14)

This study aimed to describe the clinical characteristics, treatment, evolution, and specific nursing care of adult patients who died and did not die from severe or critical ARDS who were positive for SARS-CoV-2 and were hospitalized in ICUs of hospitals and clinics of Bogotá, Colombia, to support and rethink the appropriate strategies for the mitigation and care of this disease in Colombia and across the world.

Methods

This is a longitudinal, multicenter study of a case series of adult patients diagnosed hospitalized with COVID-19. The design had a retrospective component, given that the inclusion of patients began on March 1, 2020, corresponding to the period in which the outbreak began in Colombia, and a prospective component because all the cases admitted to the ICU observed until December 15, 2020 were included. Four hospitals of level IV complexity in Cundinamarca and Santander agreed to participate in the study after evaluation and acceptance of the project by their respective ethics committees.

The study entry criteria included adults aged 18 years or older with a definite positive diagnosis of ARDS due to SARS-CoV-2 obtained by the polymerase chain reaction (PCR) test of a nasopharyngeal sample, who required admission to the ICU due to their severe or critical condition or other existing evidence. Patients who were not treated in the ICU for some reason or who died before admission or in the first 4-6 hours in the ICU were excluded. All hospitals included about 25% of the participants. No sample size calculation was performed.

We defined a severe case as the presence of oxygen saturation ($\leq$92%) at rest or $PaO2/F_{IO2}$ of <300 mmHg. Critical cases included patients with a diagnosis of respiratory failure, shock, or multiorgan failure who required mechanical ventilation. The severity was judged by the Berlin classification of ARDS.(15) The inclusion of at least 150 patients in the participating centers was planned before the signing of informed consent [administered in each ICU to family members]. Follow-up was performed from the time of admission of all consecutive patients to the ICU until discharge from the ICU due to recovery, hospital discharge, or death. The main outcome included the clinical outcome of alive vs. deceased. Living was defined as surviving at the time of discharge from the ICU. Death was recorded from a diagnosis of death by the attending physician.

Other variables measured were (i) sociodemographic aspects; (ii) health history [comorbidities, body mass index], previous treatments, and consumption of toxic substances [cigarettes, alcohol, stimulants]; (iii) epidemiological data related to the onset of COVID-19 (probable contagion, time of onset of symptoms, symptoms at the time of admission, length of stay in the ICU, length of stay in the hospital); (iv) classification of severity and medical treatment; (v) variables related to support/rescue procedures (use of extracorporeal membrane oxygenation or renal replacement therapy); and (vi) nursing care related to the prone position, onset time after the start of invasive ventilation, initiation of early mobilization, and care related to the well-being of the patient. The leaders of each center received training on the inclusion of patients and collection of information. They also received training on the inclusion of information in the study platform [http://investigacionenfermeriauci.org/], in which the identification of each center was anonymized.

The statistical analysis plan included the proportion of patients admitted to the ICU out of the total number of infected patients treated in each center and the proportion with each severity of ARDS. The characteristics, interventions, procedures, and nursing care of the individual patients in the ICU are reported as count (%), mean (standard deviation, SD), and median (interquartile range) for deceased and alive patients. Similarly, the time ranges (hours) between onset of symptoms and admission to the ICU, start of mechanical ventilation, and death were described, as were the time of admission to the ICU and initiation of the prone position, length of stay in the ICU, length of hospital stay, discharge time, and confirmation of tests in suspected patients. To compare categorical variables between groups (living and deceased), we used the chi-squared test or Fisher's exact test. For continuous variables, we used Student's t test or the Mann–Whitney–Wilcoxon test.

Results

By December 2020, 4426 patients had been admitted to the four hospitals participating in the study, with a diagnosis of pneumonia and a confirmation for SARS-CoV-2. Of these patients, 587 (13%) were admitted to the ICU and were critically ill, of whom 476 (82%) were included in the present study. The other 111 patients were not included since neither the patients nor their relatives had the opportunity to sign an informed consent form. A total of 207 (43.7%) enrollees died, and 266 (56.3%) survived.

The majority of the patients (70%) were men, with a median age of 63.6 years, were from urban regions (93.2%), came from low socioeconomic strata (54.6%), were contributory regime members (82.2%), did not live alone (83.7%), and had a poor educational level (68.3%). 56.3 percent lived and 43.7 percent died. With a median age of 68.4 years, there was a substantial difference in prevalence, with a higher frequency in non-living persons (Table 1).

A higher frequency of arterial hypertension (HTN), obesity, cardiac disease, and current cigarette smoking were identified among the comorbidities discovered (Table 2).

Among the observed antecedents, those who died had a higher incidence of comorbidities (statistically significant) than those who lived. Hypertension, chronic obstructive pulmonary disease-COPD-, cardiomyopathies, arrhythmias, and peripheral vascular disease were more common in the deceased. Similarly, the deceased had a greater body mass index-BMI- than the living.

The most frequent symptoms seen at the time of admission were dyspnea, cough, fever, and fatigue. Significant differences were observed, with a greater presence of dyspnea, fatigue, and nausea in those who died. (Table 3). The median time between the onset of symptoms and hospital admission was 7 days in both groups. The median time between hospital admission and admission to the ICU was 3.5 days (Table 4), which was also similar between groups (Table 3).

Table 1. Sociodemographic characteristics of 473 patients included in the study according to vital status at ICU discharge

Characteristics	Total *n*=473	Deceased *n*=207	Alive *n*=266	*p*-value
Male sex, n (%)	331 (70.0)	144 (69.6)	187 (70.3)	0.863
Age years, median (IQR)	63.6 (53.4-73.1)	68.4 (60.5-75.7)	59.3 (47.7-68.9)	<0.001
Urban area of origin [*n*= 455], n (%)	424 (93.2)	178 (89.5)	246 (96.1)	0.008*
Socioeconomic stratum [*n*=365], n (%)				0.643*
1-2	199 (54.6)	92 (57.1)	107 (52.4)	
3-4	160 (43.8)	66 (41.0)	94 (46.1)	
5-6	6 (1.6)	3 (1.9)	3 (1.5)	
Social security regime [*n*=460], n (%)				0.117*
Contributive	378 (82.2)	157 (77.7)	221 (85.7)	
Subsidized	60 (13.0)	33(16.3)	27 (10.5)	
Linked/uninsured	13 (2.8)	6 (3.0)	7 (2.7)	
Living arrangement [*n*=429], n (%)				0.335
Not alone	359 (83.7)	157 (81.8)	202 (85.2)	
Alone	70 (16.3)	35 (18.2)	35 (14.8)	
Occupation [*n*=361], n (%)				0.010*
Housewife	90 (24.9)	43 (29.2)	47 (22.0)	
Employee	88 (24.4)	30 (20.4)	58 (27.1)	
Retired	80 (22.2)	41 (27.9)	39 (18.2)	
Health worker	11 (3.0)	1 (0.7)	10 (4.7)	
Independent worker	92 (25.5)	32 (21.8)	60 (28.0)	
Schooling level [*n*=224], n (%)				0.481*
Primary	86 (38.4)	34 (44.7)	52 (35.1)	
Baccalaureate	67 (29.9)	19 (25.0)	48 (32.4)	
Technician	16 (7.1)	6 (7.9)	10 (6.8)	
University	55 (24.6)	17 (22.4)	38 (25.7)	

IQR = interquartile range, * Fisher's exact test

Table 2. Health history of the 473 patients according to vital status at ICU discharge

Characteristics	Total *n*=473	Deceased *n*=207	Alive *n*=266	*p*-value
Comorbidities and Habits				
Arterial hypertension [*n*=471], *n* (%)	243 (51.6)	125 (61.0)	118 (44.4)	<0.001
Obesity [*n*=451], *n* (%)	119 (26.4)	54 (27.5)	65 (25.5)	0.623
BMI [*n*=451], median (IQR)	27.1 (24.2-30.3)	27.3 (24.4-30.4)	26.7 (23.9-30.3)	0.003†
COPD [*n*=466], *n* (%)	31 (6.7)	21 (10.4)	10 (3.8)	0.004
Cardiopathy [*n*=467], n (%)	46 (9.9)	29 (14.2)	17 (6.5)	0.005
Renal disease, n (%)	36 (7.6)	19 (9.2)	17 (6.4)	0.257
Vascular peripheral disease [*n*=467], n (%)	23 (4.9)	15 (7.3)	8 (3.1)	0.050*
Active cancer [*n*=466], n (%)	21 (4.5)	12 (5.9)	9 (3.4)	0.260
Arrhythmias [*n*=466], n (%)	20 (4.3)	14 (6.9)	6 (2.3)	0.020
HIV/autoimmune illness [*n*=465], n (%)	13 (2.8)	7 (3.5)	6 (2.3)	0.573*
Stroke [*n*=463], n (%)	8 (1.7)	3 (1.5)	5 (1.9)	1.000*
Currently pregnant [*n*=107], n (%)	3 (2.8)	1 (2.2)	2 (3.2)	1.000*
Smoker [*n*=442], n (%)	36 (8.1)	15 (7.8)	21 (8.4)	0.801
Alcohol drinker [*n*=439], n (%)	15 (3.4)	11 (5.8)	4 (1.6)	0.031*
Pharmacological history, *n* (%)				
Antihypertensives [*n*=470]	228 (48.5)	115 (56.1)	113 (42.6)	0.004
Beta blockers [*n*=466]	82 (17.6)	54 (26.5)	28 (10.7)	<0.001
Lipid-lowering drugs [*n*=460]	74 (16.1)	42 (21.0)	32 (12.3)	0.012
Diuretics [*n*=463]	64 (13.8)	39 (19.3)	25 (9.6)	0.003
Anticoagulants [*n*=463]	50 (10.8)	32 (15.9)	18 (6.9)	0.002
Pregnancy history [*n*=141], n (%)	56 (39.7)	21 (33.3)	35 (44.9)	0.164

* Fisher's exact test. COPD = chronic obstructive pulmonary disease, HIV = human immunodeficiency virus, BMI = body mass index, IQR = interquartile range, SD = standard deviation.

Table 3. Signs and symptoms at the time of diagnosis of COVID-19 of the 473 patients included in the study according to vital status at ICU discharge

Characteristics	Total $n=473$	Deceased No $n=207$	Alive $n=266$	*p*-value
Fever [$n=469$], n (%)	318 (67.8)	130 (63.4)	188 (71.2)	0.073
Cough [$n=471$], n (%)	373 (79.2)	169 (82)	204 (77)	0.180
Fatigue [$n=467$], n (%)	227 (48.6)	115 (56.4)	112 (42.6)	0.003
Dyspnea [$n=472$], n (%)	374 (79.2)	174 (84.5)	200 (75.2)	0.014
Nausea [$n=466$], n (%)	44 (9.4)	28 (13.7)	16 (6.1)	0.006
Myalgia [$n=467$], n (%)	169 (36.2)	80 (39.6)	89 (33.6)	0.180
Diarrhea [$n=464$], n (%)	78 (16.8)	38 (18.7)	40 (15.3)	0.332
Pain swallowing [$n=468$], n (%)	144 (30.8)	61 (29.9)	83 (31.4)	0.721
Other symptoms [$n=466$], n (%)	282 (60.5)	133 (64.7)	149 (57.3)	0.112
Time between onset of symptoms and hospital admission, median (IQR), days	7 (4-10)	7 (4-9)	7 (4-10)	0.239

IQR = interquartile range.

The most common diagnosis of ICU admission was pneumonia (413 patients, 88.8%), of which 271 (60.2%) cases advanced to ARDS and 58 (12.9%) were accompanied by shock at admission. Severe ARDS was more prevalent in deceased patients than in living patients (Table 4). Among the risk indicators at admission of the patients who died were lower hemodynamic and ventilatory parameters, such as systolic and diastolic blood pressure. Upon admission to the ICU, those who died had a lower oxygen saturation, with higher ventilatory support parameter requirements of tidal volume, than the living patients. Likewise, the deceased had a higher Sequential Organ Failure Assessment (SOFA) score.

Table 5 lists the nursing treatments administered. The patients who died required greater support with mechanical ventilation, with a longer dwell time, than the living patients ($p<0.001$). Of all the patients, 59.8% received pronation, and this rate was higher in those who died (78.7%). The medications that were administered most often were antibiotics, anticoagulants, dexamethasone, vasopressors, inotropes, and bronchodilators. Of these medications, only bronchodilators and dexamethasone were given at similar rates between the two groups. Additionally, those who died required the insertion of central catheters, peripherally inserted central catheters (PICCs), rescue therapy with renal replacement, and the start of enteral nutrition (EN) more frequently for their care in the ICU than the live group (all $p<0.05$).

Table 4. Characteristics related to ICU admission of patients included in the study according to vital status at ICU discharge

Characteristics	Total *n*=473	Deceased *n*=207	Alive *n*=266	*p*-value
Admission diagnosis, *n* (%)				
Pneumonia [*n*=465]	413 (88.8)	185 (90.7)	228 (87.4)	0.258
ARDS [*n*=450]	271 (60.2)	121 (61.1)	150 (59.5)	0.733
Shock [*n*=451]	58 (12.9)	45 (22.3)	13 (5.2)	<0.001
Place of referral, *n* (%)				
Emergency room	247 (53.5)	121 (59.6)	126 (48.7)	0.019
Hospitalization	187 (40.5)	70 (34.6)	117 (45.0)	0.025
Time between hospital admission and admission to the ICU, median (IQR), days	3.5 (1-4)	3.4 (1-4)	3.6 (1-4)	0.979
Degree of severity of ARDS [*n*= 266], n (%)				0.139
Mild ARDS	14 (5.3)	6 (5.1)	6 (5.4)	
Moderate ARDS	60 (22.6)	20 (17)	40 (27)	
Severe ARDS	192 (72.2)	92 (78)	100 (65.6)	
Hemodynamic variables, median (IQR)				
Systolic BP mmHg	120 (107-134.5)	117 (101-133)	124.5 (111-135)	0.005
Diastolic BP mmHg	74 (61-82)	70 (59-81)	74 (64-84)	0.008
Temperature °C	36.2 (36-37)	36.3 (36-37)	36.2 (36-37)	0.879
Heart rate (beats/min)	87 (74-100)	86 (72-101)	87 (75-99)	0.839
Respiratory rate, min	22 (18-26)	22 (18-28)	22 (18-25)	0.297
Oxygen saturation, mean (SD)	89.7 (7.3)	88.8 (7.5)	90.4 (7.1)	0.024
F_{i02} (%)	70 (35-90)	70 (50-90)	60 (32-90)	<0.001
SOFA score [*n*=339]	6 (3-10)	8 (4-11)	5 (3-8)	<0.001
Barthel score *[n*=132]	100 (52-100)	100 (80-100)	100 (47-100)	0.290
Delirium CAM-ICU [*n*=267], n (%)	11 (4.1)	1 (1.1)	10 (5.8)	0.103*
Parameters at the beginning of ventilatory support)				
Oxygen saturation% [*n*= 347]	92 (89-94)	92 (88-94)	92 (90-94)	0.224
F_{i02}% [*n*=341], median (DS)	75.5 (25.1)	76 (25.1)	74.9 (25.3)	0.893
PaO_2 [*n*=294], median (RIC)	61 (51-75.9)	58 (49-70)	65 (57-84.6)	<0.001
PEEP [*n*=342], media (DS)	11.3 (2.6)	11.2 (2.8)	11.3 (2.2)	0.357
Tidal volume [*n*= 132], median (IQR)	430 (400-480)	440 (408-480)	387 (420-480)	0.189
Laboratories, median (IQR)				
Troponin I *[n*=271]	0.02 (0.01-0.208)	0.04 (0.01-0.69)	0.01 (0.01-0.09)	<0.001
Creatinine [*n*=462], mg/dl	0.9 (0.76-1.17)	0.97 (0.8-1.34)	0.9 (0.7-1.1)	<0.001
Secondary prothrombin time [*n*=418]	14.1 (12.2-15.1)	14.1 (11.7-15.8)	14.2 (12.3-15.4)	0.688
Secondary partial thromboplastin time *[n*=415]	30.1 (28.5-32.4)	30.5 (28.7-34)	30.1 (28.4-31.5)	0.044
PCR mg/L [*n*=397]	39.5 (10.3-150.8)	79.1 (16-169.4)	27.4 (6.2-138.3)	<0.001
High-flow oxygen devices [*n*= 347], *n* (%)				0.225
Non-reinhalation mask	238 (68.6)	116 (64.8)	122 (72.6)	
Orotracheal tube	91 (26.2)	54 (30.2)	37 (22)	
Venturi	18 (5.2)	9 (5)	9 (5.4)	

ARDS = acute respiratory distress syndrome, BP = blood pressure, IQR = interquartile range. * Fisher's exact test

Table 5. Treatment during the ICU stay of the 473 patients included in the study according to vital status at ICU discharge

Nursing care	Total *n*=473	Deceased *n*=207	Alive *n*=266	*p*-value
Type of ventilation, n (%)				<0.001
Invasive (mechanical ventilation)	348 (73.6)	202 (97.6)	146 (54.9)	
Noninvasive	16 (3.4)	1 (0.5)	15 (5.6)	
Days between admission and start of mechanical ventilation, median (IQR)	3 (1-6)	3 (2-7)	3 (1-5)	0.063
Days on ventilation, median (IQR)	12 (7-18)	13 (8-18)	10 (6-18)	0.045
Pronation, n (%)	283 (59.8)	163 (78.7)	120 (45.1)	<0.001
Number of hours/day in pronation *[n*= 275], median (IQR)	16 (16-24)	16 (16-24)	16 (16-18)	0.003
Administration of medications, n (%)				
Antibiotics	447 (94.5)	201 (97.1)	246 (92.5)	0.029
Dexamethasone *[n*=470]	396 (84.3)	177 (86.3)	219 (82.6)	0.275
Vasopressors [*n*=470]	246 (52.3)	175 (84.5)	71 (27)	<0.001
Antivirals [*n*=461]	26 (5.6)	15 (7.5)	11 (4.2)	0.136
Antimalarials [*n*=457]	21 (4.6)	9 (4.6)	12 (4.6)	1.000*
Bronchodilators [*n*= 465]	240 (51.6)	102 (50.7)	138 (52.3)	0.744
Inotropics [*n*=463]	178 (38.4)	127 (62.6)	51 (19.6)	<0.001
Anticoagulants [*n*=472]	407 (86.2)	186 (90.3)	221 (83.1)	0.024
Drug infusion catheter, n (%)				
Central catheter [*n*=468]	212 (45.3)	132 (64.4)	80 (30.4)	<0.001
PICC [*n* = 466]	204 (43.8)	101 (50)	103 (39)	0.018
Peripheral catheter *[n* = 466]	281 (59.9)	107 (52.2)	174 (65.9)	0.003
Extracorporeal membrane for oxygenation *[n* = 465], n (%)	3 (0.7)	1 (0.5)	2 (0.8)	1.000
Renal replacement therapy [*n* = 468], n (%)	79 (16.9)	61 (29.8)	18 (6.8)	<0.001
Enteral nutrition catheter [*n* = 470], n (%)	338 (71.9)	190 (92.7)	148 (55.9)	<0.001
Parenteral nutrition catheter *[n* = 467], n (%)	15 (3.2)	7 (3.4)	8 (3.0)	0.799*

IQR = Interquartile range, TOT = Orotracheal tube.

* Fisher's exact test

In average, 83.6 percent of patients received bed position alterations as part of the nonpharmacological therapy (Table 6) offered by nurses. Patients who died had more positional changes than those who were alive (89.8% vs. 78.9%, $p=0.002$). Oral hygiene was advocated more frequently in surviving patients (92.4 vs. 83.4, $p=0.002$) than in deceased patients. Communication between the patient and his or her family (by phone or video call) was more common in those who survived than in those who died.

The hospital stay was 18 days in general (IQR 11-26), being longer in living patients than in deceased patients (19, IQR 11-29 vs. 17, IQR 11-22, $p = 0.010$). The median ICU stay was 12 days (IQR 6-19) and was also longer in the deceased (median 15, IQR 9-20 vs. 9, *IQR* 4-17, $p \leq 0.001$). Complications in the ICU are shown in Table 7. Among the most frequently identified in deceased patients compared to living patients were septic shock (63.3 vs. 12.4, $p<0.001$), renal failure (47.8 vs. 8.3, $p<0.001$), and thromboembolism (13.0 vs. 6.4, $p=0.006$). Pressure ulcers were also more frequent in deceased patients than living patients (38.7 vs. 15.8, $p<0.001$).

Table 6. Nursing care

Nursing care	Total $n=473$	Deceased $n=207$	Alive $n=266$	*p*-value r
Skin care measures Changes in bed position [n= 470], n (%)	393 (83.6)	184 (89.8)	209 (78.9)	0.002
Number of position changes/day [n= 366], mean (IQR)	2.6 (2-2)	2.7 (2-2)	2.6 (2-2)	
Promotion of early mobilization, n (%)	95 (20.1)	62 (30.0)	33 (12.4)	<0.001
Comfort Measures				
Bed bath, n (%)	459 (97.04)	201 (97.1)	258 (97.0)	
Number of bed baths/day [n= 453], median (IQR)	1 (1-2)	1 (1-2)	1 (1-2)	
Oral hygiene, n (%)	416 (88.5)	171 (83.4)	245 (92.4)	0.002
Promotion of communication with family				
Telephone [n=367], n (%)	234 (63.8)	109 (60.9)	125 (66.5)	
Video call [n=365], n (%)	191 (52.3)	82 (45.8)	109 (58.6)	0.014
In person [n=366], n (%)	18 (4.9)	11 (6.2)	7 (3.7)	

IQR = interquartile range.

Table 7. Complications during hospitalization of patients included in the study according to vital status at ICU discharge

Complications [n (%))	Total *n*=473	Deceased *n*=207	Alive *n*=266	*p*-value
Septic shock	164 (34.7)	131 (63.3)	33 (12.4)	<0.001
Renal failure	121 (25.6)	99 (47.8)	22 (8.3)	<0.001*
Pressure ulcers	122 (25.8)	80 (38.7)	42 (15.8)	<0.001
Arrhythmias	72 (15.2)	57 (27.5)	15 (5.6)	<0.001
Delirium	63 (13.3)	16 (7.7)	47 (17.7)	0.006
Thromboembolism	44 (9.3)	27 (13)	17 (6.4)	0.006
Acute myocardial infarction	17 (3.6)	14 (6.8)	3 (1.1)	0.002*
Myocarditis	9 (1.9)	9 (4.3)	-	<0.001*
Intravascular coagulation	7 (1.5)	6 (2.9)	1 (0.4)	0.080

* Fisher's exact test

Discussion

We report in our study 473 critically ill patients with a confirmed diagnosis of SARS-CoV-2 acquired during the first outbreak of the pandemic in Colombia in 2020 who were hospitalized in intensive care units in the four participating hospitals. A total of 207 patients died (43.8%), and 266 (56.8%) survived. Most were admitted with a diagnosis of pneumonia (88.8%)and with ARDS (60.2%). Multiple studies have reported the characteristics and evolution of patients hospitalized for COVID-19 in intensive care units since the beginning of the pandemic around the world. We find some similarities and differences in relation to these references, which we present below. Our paper also includes descriptive information related to nursing care in critical patients.

The mortality rate of 43.7% was very similar to that reported by the Intensive Care National Audit & Research Center (ICNARC) in infected patients in 2020.(16) This report included a mortality of 48.6% of a total of 224,748 admitted to 263 ICUs (London, UK). However, the length of stay in the ICUs of our study was longer in those who died (median 15 days) than those who survived (median 9 days), contrary to that reported by the ICNARC ICUs, in which the length of stay of the deceased was approximately 8 days and of those who survived 13 days.(16)

Characteristics such as age, sex, and having some comorbidities have been associated with greater susceptibility to infection and complications after infection by SARS-CoV-2.(7-11,17) In our data, the majority of those infected by SARS-CoV-2 who died were men, and they were older than the survivors, consistent other studies.(7,8) The identification of comorbidities has been key in the characterization of those who may be at risk of lower survival. In our study, the results coincide with those reported in a sample of 46,248 patients admitted to the ICU with a diagnosis of COVID-19, included in a systematic review of eight studies reported by Yang *et al.*(18) They found higher mortality in patients with a history of cardiovascular disease [OR 3.42], respiratory system disease [OR 2.46], or arterial hypertension [OR 2.46]. Overweight in our study showed a higher frequency in the deceased (not significant), similar to the findings of Yang et al*.* (27.3 vs. 26.7, p=0.187).(18)

The most frequent symptoms at the time of admission were cough (79%), dyspnea (79.2%), fever (67.8%), and fatigue (48.6). Dyspnea and fatigue were more frequent in patients who died than those who did not. These data are similar to the data reported, for example, in the systematic review and meta-analysis conducted by Grant *et al.,*(19) which included 138 studies conducted in nine countries. In that study, the most prevalent symptoms were fever (78%) and fatigue (31%).(19) Nausea was frequent in our cohort but had a very low prevalence in the study by Grant *et al.* 19)

Considering that patients with COVID-19 often have bilateral interstitial pneumonia/ARDS with acute hypoxemic respiratory failure and multiple-organ failure, we observed some indicators that have been reported as determinants of prognosis in these patients upon admission to the ICU. Among the predictors of mortality, we observed that at the time of admission, patients who died in the ICU had a higher SOFA score, consistent with Gao *et al.*, in which a high SOFA score was associated with a high risk of mortality (HR 1.171, 95% CI 1.013–1.354, p = 0.033).(17) In this same group, another indicator was the need for invasive mechanical ventilation, more pronation being required in more severe disease. Respiratory nursing care related to the adequate administration of mechanical ventilation parameters and the implementation of pronation are some of the most frequent interventions in the ICU, especially in patients diagnosed with ARDS due to COVID-19. We found elevated mortality in patients exposed to mechanical ventilation, 58%, higher than the 41% reported in several studies during the first peak of the pandemic. Medications are administered hourly and according to the medical prescription by the nursing professional through a central catheter or PICC.(20) For the most part, the insertion of the PICC, insertion of peripheral lines, and care during the administration of medications is performed by the nursing professional, a constant of quality in the ICU.(20) Specialized medications are given by nurses according to the critical state of each patient and the system of greatest compromise (cardiovascular, renal, neurological, immunological, and systemic).

Among the drugs administered during the first outbreak in our country, two drugs, the antiviral remdesivir(21) and the immunomodulatory corticosteroid dexamethasone (RECOVERY Trial Study),(22) were approved for use in these patients. The evidence suggests they help manage and reduce the mortality of those who require respiratory support with oxygen or mechanical ventilation. During the first peak of the pandemic, we observed the beginning of the management of the disease with antivirals with a very low frequency of use, which makes it difficult to establish an estimate of their effect. The frequency of use of dexamethasone in these patients was very similar in both the living and the deceased. Anticoagulants were also given to 86.2% of these patients with COVID-19 as part of its treatment to prevent the occurrence of thromboembolic events and their possible complications, as was mentioned in some studies.(23)

In our study, cardiovascular support with inotropes and vasopressors was used mostly in patients who died in the ICU, given the severity of the disease and the presence of complications such as septic shock and renal failure. The most frequent complication in our study was septic shock, whose association with mortality in COVID-19 patients has also been similar in other studies (OR of 3.2, p = 0.003).(24) Similarly, support with renal replacement therapy was required in 17% of critically ill patients with acute kidney injury. Renal failure was observed much more frequently in the deceased, in line with the report of the study by Ferrando *et al.,*(24) which showed an increased probability of mortality in patients with renal failure and COVID-19 (OR of 2.4). These results are similar to the ICNARC report,(16) which showed that 26.7% of patients in the final state in the ICU required advanced renal support, 65% basic cardiovascular support, and 30.4% advanced cardiovascular support.

Other nursing care described was nutritional support, preventive care for the onset of delirium, skin care, and basic care such as body and oral hygiene. Regarding nutritional support in our study, of the total number of patients included in the ICU who received EN, 72% had been reported in similar studies.(25) The deceased received this intervention in greater proportion, but it is not possible to establish any association with EN, since we do not have information on the onset of EN, the status or nutritional assessment of the patients at this time, or other associated complications of pronation, which can determine the relationship between survival and EN use.

The nursing activities aiming to promote behaviors that improve the COVID-19 patient's mental orientation (prevention of delirium), calmness, and cooperation in the ICU, according to the protocols of intensive care,(26) was implemented most often in patients at high risk of death, probably due to their critical condition and the promotion of bed mobilization. The promotion of patient contact with the family via phone calls or video calls was more frequent in the living population. This group, despite communicating better with their relatives, presented delirium more frequently than the deceased (17.7% vs. 7.7%). Despite the promotion of mobilization, an activity directly implemented by nurses in 83.6% of the patients included in the study, the frequency of its implementation depended on the high frequency of pronation, which was performed in prolonged cycles of 12-16 hours. Prolonged cycles of pronation together with other factors, such as hypoperfusion and nutritional failures (probably a late start in the ICU), lead to the appearance of pressure ulcers in 25% of patients, with a higher prevalence in deceased patients (38.7%) with worse critical state, in line with other studies.(20,27,28)

Oral hygiene, a basic part of nursing care, has been highly recommended in patients in the ICU on mechanical ventilation, since the oral cavity is considered a reservoir for cross-infection for caregivers and one of the routes of entry of microorganisms. In our study, oral hygiene was performed more frequently in living patients than in deceased patients. These results agree with those reported in the study by Kamel *et al.*,(29) in which it was observed that a poor state of oral health, that is, with low hourly cleaning, was related to a greater severity of COVID-19. On the other hand, a high frequency of general bed bathing was maintained to provide comfort to patients. The data of this study give us information on the characteristics, clinical evolution, complications, and nursing interventions that were administered to adult patients hospitalized in four ICUs of Colombian hospitals.

The limitations of the study are related to the possibility of selection biases related to the noninclusion of all patients consecutively. This was because critically ill patients could not sign the informed consent form themselves, and their family members, because they could not enter hospitals during the pandemic, could not authorize entry into the research study. Likewise, it is possible that the biases may have been related to incomplete data that should have been collected retrospectively from the medical records once the patient had died. The observations made in this study correspond to the characteristics of the patients who received care in the four participating institutions and the management protocols of each institution; therefore, the generalization of their results is limited to the observed hospitals.

Conclusion. Since the beginning of the SARS-CoV-2 pandemic in Colombia and in the rest of the world, nursing personnel in ICUs have had to initiate a process of relearning and skills training for the care of critical patients with ARDS. Although nurses implement a number of interventions derived from medical orders, the progress and recovery of each patient in intensive care depends on the combination of these measures with their own measures within the role that nurses play on an hourly basis. Each intervention depends on an assessment of the health status and the adequate interpretation of the vital signs, from which the results of the administration of medications, respiratory care, positioning, and identification and timely management of complications in the ICU are derived.

In conclusion, the findings of our study add to the understanding of the behavior and the impact of the COVID-19 pandemic in Colombia, which are very similar to those in the rest of the world. The progress of the pandemic, the rapidity of the transmission of the disease, its evolution, and its impact on certain systems, such as the respiratory system, allowed us to recognize the need to build an appropriate multidisciplinary care plan in intensive care applicable to future epidemics. The behavior of the pandemic, similar to that observed in the rest of the world, in terms of mortality and demographic characterization, comorbidities, ventilatory parameters, and complications allowed us to understand the importance of coordinated multidisciplinary work and to highlight the importance of specific nursing care linked to all structured treatment processes in the ICU. The findings of the study improve our understanding of the pandemic in Colombia and will help in the construction of strategic and curriculum plans for the future management of similar situations.

References

1. Organización Mundial de la Salud. Mapa de casos confirmados de COVID-19 de la OMS [Internet]; 2022 [cited 8 Jan 2022]. Available from:https://www.paho.org/es/temas/coronavirus/enfermedad-por-coronavirus-covid-19.
2. Organización Panamericana de la Salud. Brote de enfermedad por el Coronavirus (COVID-19). 2022 [cited 8 Jan 2022] Available from: https://www.paho.org/es/temas/coronavirus/brote-enfermedad-por-coronavirus-covid-19
3. Zhou F, Yu T, Du R, Fan G, Liu Y, Liu Z, Xiang J, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. Lancet. 2020; 395(10229):1054-62.
4. Reported cases and deaths by country or territory [Internet]. 2022 [Cited 8 Jan 2022]. Available from: https://www.worldometers.info/coronavirus/#countries.
5. Anesi GL. Coronavirus disease 2019 (COVID-19): Critical care issues. Literature review current through: 2020 [cited 7 Apr 2020].
6. Harapan H, Itoh N, Yufika A, Winardi W, Keam S, Te H, et al. Coronavirus disease 2019 (COVID-19): A literature review. J. Infect. Public Health. 2020; 13(5):667-73.
7. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N. Engl. J. Med. 2020; 382(18):1708-20.
8. Wang D, Hu B, Hu Ch, Fang Zhu F, Liu X., et al. Clinical Characteristics of 138 Hospitalized Patients with 2019 Novel Coronavirus–Infected Pneumonia in Wuhan, China. JAMA. 2020; 323(11):1061-9.
9. Bhatraju PK, Ghassemieh BJ, Nichols M, Kim R, Jerome KR, Nalla AK, et al. Covid-19 in Critically Ill Patients in the Seattle Region - Case Series. N. Engl. J. Med. 2020; 382(21):2012-22.
10. Richardson S, Hirsch JS, Narasimhan M, Crawford JM, McGinn T, Davidson KW; et al. Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized with COVID-19 in the New York City Area. JAMA. 2020 May 26;323(20):2052-2059. doi: 10.1001/jama.2020.6775. Erratum in: JAMA. 2020; 323(20):2098.
11. Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, et al. Baseline Characteristics and Outcomes of 1591 Patients Infected with SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. JAMA. 2020; 323(16):1574-81. Erratum in: JAMA. 2021; 325(20):2120.

12. Centros de Control y Prevención de Enfermedades CDC. Guía clínica provisional para el tratamiento de pacientes con infección confirmada por el nuevo coronavirus 2019 (2019-nCoV) [Internet]; 2020 [12 Feb 2020]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html
13. Cook TM, El-Boghdadly K, McGuire B, McNarry AF, Patel A, Higgs A. Consensus guidelines for managing the airway in patients with COVID-19: Guidelines from the Difficult Airway Society. Anaesthesia. 2020; 75(6):785-99.
14. Llamamiento en situación de emergencia por COVID-19 desde la Sociedad Española de Medicina Intensiva, Crítica y Unidades Coronarias (SEMICYUC)y la Sociedad Española de Enfermería Intensiva y Unidades Coronarias (SEEIUC) a los profesionales de cuidados intensivos [Internet]. 2020 [cited 28 Mar 2020]. Available from: http://seeiuc.org/wp-content/uploads/2020/03/Comunicado-conjunto-SEMICYUC-SEEIUC.pdf
15. Sánchez-Oro R, Torres Nuez J, Martínez-Sanz G. Radiological findings for diagnosis of SARS-CoV-2 pneumonia (COVID-19). Med. Clin. (Barc). 2020; 155(1):36-40.
16. Intensive Care National Audit and Research Centre (ICNARC). ICNARC report on COVID-19 in critical care. April 24th. London: ICNARC; 2020, page 1-23 [23 Apr 2020]. Available from: https://www.icnarc.org/DataServices/Attachments/Download/c5a62b13-6486-ea11-9125-00505601089b
17. Gao J, Zhong L, Wu M, Ji J, Liu Z, Wang C, Xie Q, Liu Z. Risk factors for mortality in critically ill patients with COVID-19: a multicenter retrospective case-control study. BMC Infect. Dis. 2021; 21(1):602.
18. Yang J, Zheng Y, Gou X, Pu K, Chen Z, Guo Q, et al. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. Int. J. Infect. Dis. 2020; 94:91-5.
19. Grant MC, Geoghegan L, Arbyn M, Mohammed Z, McGuinness L, Clarke EL, et al. The prevalence of symptoms in 24,410 adults infected by the novel coronavirus (SARS-CoV-2; COVID-19): A systematic review and meta-analysis of 148 studies from 9 countries. PLoS One. 2020 23; 15(6):e0234765.
20. Asghari E, Archibald M, Roshangar F. Nursing interventions for patients with COVID-19: A medical record review and nursing interventions classification study. Int. J. Nurs. Knowl. 2022; 33(1):57-63.
21. Beigel JH, Tomashek KM, Dodd LE, Mehta AK, Zingman BS, Kalil AC, et al. Remdesivir for the Treatment of Covid-19 - Final Report. N. Engl. J. Med. 2020; 383(19):1813-26.
22. RECOVERY Collaborative Group. Tocilizumab in patients admitted to hospital with COVID-19 (RECOVERY): a randomised, controlled, open-label, platform trial. Lancet. 2021; 397(10285):1637-45.
23. Paranjpe I, Fuster V, Lala A, Russak A, Glicksberg BS, Levin MA, et al. Association of Treatment Dose Anticoagulation with In-Hospital Survival Among Hospitalized Patients with COVID-19. J. Am. Coll. Cardiol. 2020; 75(1): 122-4.
24. Ferrando C, Mellado-Artigas R, Gea A, Arruti E, Aldeota C, Bordell A, et al. Patient characteristics, clinical course and factors associated to ICU mortality in critically ill patients infected with SARS-CoV-2 in Spain: A prospective, cohort, multicentre study. Rev. Esp. Anestesiol. Reanim. (Engl Ed). 2020; 67(8):425-37.
25. Moreira E, Olano E, Manzanares W. Terapia nutricional en el paciente crítico con COVID-19. Una revisión. Rev. Méd. Urug. [Internet]. 2020; 36(4):102-30.
26. Rojas JS, Urriago JD, Montaño YC, Moreno L, Ahumada E, Chavarro GA, et al. Enfoque y manejo clínico de pacientes con enfermedad por SARS cov2 (covid-19) en unidad de cuidado intensivo. Rev. Méd. Sánitas. 2020; 23(1):14-33. 27.Bloomfield R, Noble DW, Sudlow A. Prone position for acute respiratory failure in adults. Cochrane Database Syst. Rev. 2015; (11):CD008095.
27. Team V, Team L, Jones A, Teede H, Weller CD. Pressure Injury Prevention in COVID-19 Patients with Acute Respiratory Distress Syndrome. Front Med (Lausanne). 2021; 7:558696.
28. Kamel AHM, Basuoni A, Salem ZA, AbuBakr N. The impact of oral health status on COVID-19 severity, recovery period and C-reactive protein values. Br. Dent. J. 2021 [cited 11 Feb 2021]; Available from: 10.1038/s41415-021-2656-1.

A National Survey of the Prevalence of Chronic Pain in Nursing Students and the Associated Factors

Original article

Maryam Shaygan[1,5]
https://orcid.org/0000-0002-1456-9340
Banafsheh Tehranineshat[2,6]
https://orcid.org/0000-0002-2066-5689
Agrin Mohammadi[3,7]
https://orcid.org/0000-0002-5613-4564
Zohreh Foruhi[4,7]
https://orcid.org/0000-0002-5344-6386

National Survey of the Prevalence of Chronic Pain in Nursing Students and the Associated Factors

Abstract

Objective. To examine the prevalence of chronic pain and the associated factors among nursing students. **Methods.** This study is a descriptive, cross-sectional. The subjects were 1684 nursing students who were selected from the universities of medical sciences in Iran via cluster sampling in 2019. Data were collected using a three-part questionnaire: a demographic characteristics survey, characteristics of chronic pain, and a pain scale. **Results.** The majority of the students were female (62.1%) and single (87%).The mean age of the participants was 22.4±2.96 years. The results of data analysis showed that 30.2% of the students suffered from chronic pain. The areas which were most affected by pain were: head (31.24%), abdomen (11.98%), and the back (9.23%). 56.4% of the nursing students declared the origin of their pain to be unknown, 22.7% attributed their pain

1 Associate Professor.
Email: m2620.shaygan@gmail.com
2 Assistant Professor.
Email: tbanafsheh@yahoo.com.
Corresponding author.
3 Student. Email: agrinmohammadi@yahoo.com
4 Student. Email: z.foruhi@yahoo.com
5 Community Based Psychiatric Care Research Center, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran
6 Department of Nursing, School of Nursing and Midwifery, Hormozgan University of Medical Sciences, Bandar Abbas, Iran
7 Student Research Committee. Shiraz University of Medical Sciences, Shiraz, Iran

Conflicts of interest: None.

Receipt: August 9, 2021.

Approved: March 3, 2022.

How to cite this article: Shaygan M, Tehranineshat B, Mohammadi A, Foruhi Z. A National Survey of the Prevalence of Chronic Pain in Nursing Students and the Associated Factors. Invest. Educ. Enferm. 2022; 40(1):e09.

DOI: https://doi.org/10.17533/udea.iee.v40n1e09.

Investigación y Educación en
Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

to migraine, and 6.48% reported spinal disorders to be the cause of their pain. There was a significant relationship between the students' chronic pain and the variables of age (higher in the 29-and-above age group), marital status (higher in married subjects), and education (higher in postgraduates). **Conclusion.** A relatively large number of nursing students suffer from chronic pains. Nursing schools should contribute to improving students' knowledge of chronic pain prevention and management.

Descriptors: students, nursing; chronic pain; cross-sectional studies.

Encuesta nacional sobre la prevalencia del dolor crónico en estudiantes de enfermería y sus factores asociados

Resumen

Objetivo. Estimar la prevalencia del dolor crónico y sus factores asociados entre los estudiantes de enfermería. **Métodos.** Estudio descriptivo de corte transversal. Participaron 1684 estudiantes de enfermería (1496 de pregrado y 188 de Maestría) de las universidades de ciencias médicas en Irán seleccionados mediante un muestreo por conglomerados. Los datos se recogieron a partir de un cuestionario dividido en tres partes: una encuesta de características demográficas, características del dolor crónico y una escala de dolor. **Resultados.** La mayoría de los estudiantes fueron de sexo femenino (62.1%) y solteros (87%). La edad media fue de 22.4±2.9 años. Los resultados del análisis de los datos mostraron que el 30.2% de los estudiantes sufría dolor crónico. Las zonas más afectadas por el dolor fueron: la cabeza (31.24%), el abdomen (11.98%) y la espalda (9.23%). El origen del dolor fue más frecuentemente atribuido a la migraña (22.7%) y a los trastornos de la columna vertebral (6.5%). Un 56.4% declaró desconocer el origen de su dolor. Hubo una relación significativa entre el dolor crónico de los estudiantes y las variables: edad (mayor en el grupo de 29 años o más), estado civil (mayor en los casados), educación (mayor en los estudiantes de maestría). **Conclusión.** Un número relativamente elevado de estudiantes de enfermería sufre de dolores crónicos. Las escuelas de enfermería deben contribuir en mejorar el conocimiento de ellos acerca de la prevención y manejo del dolor crónico.

Descriptores: estudiantes de enfermería; dolor crónico; estudios transversales.

Enquete nacional sobre a prevalência da dor crónica em estudantes de enfermagem e seus fatores associados

Resumo

Objetivo. Estimar a prevalência da dor crónica e seus fatores associados entre os estudantes de enfermagem. **Métodos.** Estudo descritivo de corte transversal. Os participantes foram 1684 estudantes de enfermagem (1496 de graduação e 188 de Mestrado) das universidades de ciências médicas no Irã que foram selecionados através de uma amostragem por conglomerados. Os dados se recolheram mediante um questionário dividido em três partes: uma enquete de características demográficas, características da dor crónica e uma escala de dor. **Resultados.** A maioria dos estudantes foram do sexo feminino (62.1%) e solteiros (87%). A idade média dos participantes foi de 22.4±2.9 anos. Os resultados da análise dos dados mostraram que 30.2% dos estudantes sofriam dor crónica. As zonas mais afetadas pela dor foram: a cabeça (31.24%), o abdômen (11.98%) e as costas (9.23%). A origem da dor foi mais frequentemente atribuída à enxaqueca (22.7%) e aos transtornos da coluna vertebral (6.5%). Um 56.4% dos estudantes de enfermagem declararam desconhecer a origem da sua dor. Houve uma relação significativa entre a dor crónica dos estudantes e as variáveis: idade (maior no grupo de 29 anos ou mais), estado civil (maior nos casados), educação (maior nos estudantes de mestrado). **Conclusão.** Um número relativamente elevado de estudantes de enfermagem sofre de dores crónicas. As escolas de enfermagem devem contribuir em melhorar o conhecimento dos estudantes sobre a prevenção e manejo da dor crónica.

Descritores: estudantes de enfermagem; dor crônica; estudos transversais

Introduction

Chronic pain is a prevalent healthcare issue which can affect all age groups and cause varying degrees of disability in individuals.(1) Chronic pain defines as persistent or recurrent pain that lasts longer than three months and is associated with several biological changes, as well as having some psychological and social elements contributing to its onset, maintenance, and exacerbation.(2) Pain has emerged as a prevalent health issue among college students. Many students are living with unrelieved pains which result in their low quality of life, poor academic performance, absenteeism, sleep disorder, and reduced psycho-social well-being.(3) Due to the financial burden which it imposes on the society and the healthcare system, the prevalence of chronic pain has emerged as a global issue with adverse effects on individuals' daily activities. Even though young college students are among the main groups which suffer from chronic pain, few researchers have studied the prevalence and consequences of chronic pain among young adults and college students.(4) The results of some studies verify the high prevalence of musculoskeletal pain among college students: 42.8% of medical and non-health related students complain of neck pain and 72.1% of medical students complain of back pain.(1,5)

Despite the special lifestyle of healthcare personnel and college students, few studies have addressed musculoskeletal pain in this population.(6) In their cross-sectional study, Silva *et al.* report that 35.69% of the students of various medical specialties at Tauba University suffer from chronic pain.(7) Several studies in Iran have reported the prevalence of back pain and general pain in the adult population to be high; however, certain nursing-related activities, e.g. moving patients, and disregard for ergonomic principles cause nurses to be more prone to chronic pain and the physical limitations ensuing from it than others.(8,9) Engagement in nursing-related activities starts from nursing school (7) as nursing students are among the primary caregivers in Iran.

A review of the available literature shows that few studies have investigated the prevalence of chronic pain among nursing students.(4) Thus, there is a lack of precise information in this area. As nursing students are more prone to chronic pain than the other members of the society, study of chronic pain in this population is important. In addition, nursing students' rigorous education and training can aggravate their chronic pain. Chronic pain can adversely affect the daily and academic activities of this young population, as well as their important decisions in their life and profession.(10) Study of chronic pain in its early stages and the factors related to it can help identify students who are at higher risk and contribute to development of more effective preventive programs. One of the most important measures in pain control is determining the number of individuals who suffer from pain and the causes of their pain.(11) As the physical and psychological well-being of nursing students plays a key part in the public health of the country in the future, the present study addresses the prevalence of different types of chronic pain and the factors associated with it in the nursing students of the universities of Iran. The aim of this study was to examine the prevalence of chronic pain and the associated factors among nursing students.

Methods

This descriptive, cross-sectional study was conducted on the nursing students at the universities of medical sciences of Iran between February and October 2019. Based on the findings of previous studies and the assumption that at least 20% of nursing students suffer from chronic pain(11) and using a sample size formula and an attrition rate of 20%, sample size was set at a minimum of 1500 students. The inclusion criteria were students who finished at least one semester of study at the time at which they completed the questionnaire, students who did not work in the nursing profession or any other job, being willing to participate in the study and being a nursing student at one of the universities of medical sciences in Iran. The students who had a self-declared chronic physical condition not related to their pain (e.g. M.S, diabetes, cancer, congenital and developmental diseases, history of accidents, and surgery) were excluded.

After obtaining permission from the authorities at the nursing schools, the researchers used the lists of all the public nursing schools in the 5 geographic regions of Iran (north, south, east, west, and center). Initially, nursing schools were selected via cluster-random sampling: one school was simple randomly selected from each geographic region. Using a list of the names of all the undergraduate nursing students, the researchers coded the names and then the sample was selected from a random number table. The students who met the inclusion criteria were selected as potential participants. Next, the faculties were contacted and asked to submit the students' class schedules. On the days when the selected students were present in school, the researcher met them and informed them about the objectives of the study and the definition of chronic pain. The questionnaires were completed by the students themselves. Data were collected over a 9-month period. When the questionnaires were being completed, one of the researchers (AM or ZF) was present to answer any queries.

30 questionnaires which had not been filled out completely were eliminated. Eventually, 1684 questionnaires (completed by 1045 female and 639 male nursing students) were considered for data analysis. Data were collected using a three-part questionnaire: a demographic characteristics survey, characteristics of chronic pain, and a pain scale. The demographic characteristics survey consisted of questions about age, gender, marital status, education, parents' education, and place of residence. The section on characteristics of chronic pain addressed the location, severity, frequency, and cause of pain. To assess the severity of each student's pain, the researchers used a pain visual analog scale, which is a 10-centimeter long vertical or horizontal line on which 0 represents absence of any pain and 10 represents extreme or unbearable pain. The concurrent validity of the scale compared to NPRS (numerical pain rating scale) is 0.71-0.78, and the test-retest reliability of the scale has been reported to be 0.71-0.99.(12) In Iran, the reliability of the scale has been reported to be 0.81.(9) The collected data were analyzed in SPSS v. 24 using descriptive and inferential (chi-square) statistics. Significance level was set at less than 0.05. The present study has been approved by the ethics committee of Shiraz University of Medical Sciences, Iran (IR.SUMS.REC.1397.052). All the nursing students were informed about the objectives of the study and asked to complete the informed consent form. The students were assured that their information would remain anonymous and confidential.

Results

The present study was conducted on1496 undergraduate and 188 postgraduate nursing students. The majority of the students were found to be female (62.1%), between 18-28 years old (95%) and single (87%). The mean age of the students was 22.4±2.96 years and their grade point average was 16.03±1.18. (Table 1) Most of the students (88.8%) were bachelor's degree candidates. The highest academic degree of the students' fathers and mothers was high school diploma 778 (46.4%) and 718 (42.8%) respectively. The majority of the students 979 (58.1%) lived in a dormitory.

Table 1. Descriptive statistics for demographic characteristics of 1684 nursing students

Characteristic		No.	%
Sex			
	Male	639	37.9
	Female	1045	62.1
Age			
	18-28 years	1613	95.8
	29-39 years	65	3.9
	≥40 years	6	0.4
Marital status			
	Single	1465	87
	Married	219	13
Education			
	Undergraduate	1496	88.8
	Postgraduate	188	11.2
Father education *			
	High school or less	404	24
	Diploma	778	46.4
	University degree	496	12.6
Mother education*			
	High school or less	511	30.4
	Diploma	718	42.8
	University degree	449	26.8
Residence			
	Living in campus	979	58.1
	Living with the family	669	39.7
	Other	36	2.1

Note: Sample size varies due to non-responses (*n=1678, missing=6).

In the present study, the prevalence of chronic pain in nursing students was found to be 30.2%. The most common areas which were affected by pain were, in descending order, the head (31.24%), the abdomen (11.98%), and the back (9.23%). 381 of the 509 students with chronic pain (74.8%) declared the severity of their pain to be grade 3 or higher, and the mean was 10.69±11.42. Most of the students (56.40%) reported the cause of their pain to be unknown, i.e. the cause of their chronic pain was not a definite pathological source, 117 (22.7%) attributed their pain to migraine, and 33 (6.48%) reported spinal disorders to be the cause of their pain (Table 2). Most of the students 151 (29.66%) reported the frequency of their chronic pain to be daily, and a few 14 (2.75%) reported their pain was permanent. 391 (76.80%) had not missed classes because of their chronic pain, but 81 (15.9%) had had delays which they attributed to their pain.

Table 2. Pain characteristics of nursing students (*n*=509)

Characteristic	No.	%
Pain location		
Head	159	31.24
Neck	36	7.07
Ear	10	1.96
Eye	43	8.45
Face	32	6.28
Shoulder	23	4.52
Wrist, hand, arm	25	4.91
Abdomen	61	11.98
Knee	40	7.86
Ankle, Leg	20	3.93
Back, waist	47	9.23
Chest	13	2.57
Pain intensity		
1	22	4.32
2	106	20.82
3	150	29.47
4	103	20.24
5	84	16.50
6	27	5.32
7	11	2.16
8	5	0.98
9	0	0
10	1	0.19

Table 2. Pain characteristics of nursing students (*n*=509). (Cont.)

Characteristic	No.	%
Cause pain		
Arthritis	18	3.54
Congenital	5	0.98
Neuropathy	5	0.98
Spinal cord	33	6.48
Injury	26	5.11
Surgery	2	0.39
Poor blood circulation	2	0.39
Migraine	117	22.98
Dystrophy	2	0.39
Osteoporosis	6	1.18
Multiple sclerosis	3	0.59
Lupus	3	0.59
Unknown	287	56.40
Frequency of chronic pain		
Permanent	14	2.75
Daily	151	29.66
Weekly	224	44.01
monthly	120	23.58
University absence due to pain		
No absence	391	76.80
Absence	118	23.20
Delay due to pain		
Yes	81	15.90
No	428	84.10

The results showed that there was a significant relationship between the students' pain and their age (higher in the 29-and-above age group), marital status (higher in married students), education (higher in postgraduates). However, the relationship between pain and the variables of gender, father's education, mother's education, place of residence, and grade point average were not significant. (Table 3)

Table 3. Factors associated with chronic pain (*n*=1684)

Pain Variables	No pain *n* (%)	Chronic pain *n* (%)
Gender		
Female (*n*=1045)	719 (68.8)	326 (31.2)
Male (*n*=639)	456 (71.3)	183 (28.7)
Age		
18-28 years (n=1613)	1136 (70.4)	477 (29.6)
29-39 years (n=65)	36 (55.4)	29 (44.6)
≥40 years (n=6)	3 (50)	3 (50)
Marital status		
Single (n=1465)	1041 (71.1)	424 (28.9)
Married (n=219)	134 (61.2)	85 (38.8)
Education		
Undergraduate (n=1496)	1057 (70.6)	439 (29.4)
Postgraduate (n=188)	118 (62.8)	70 (37.2)
Father education		
High school or less (n=404)	276 (16.4)	128 (7.6)
Diploma (n=778)	539 (32.1)	239 (14.2)
University degree (n=496)	354 (21.1)	142 (8.5)
Mother education		
High school or less (n=511)	335 (20)	176 (10.5)
Diploma (n=718)	500 (29.8)	218 (13)
University degree (n=449)	334 (19.9)	115 (6.9)
Residence		
Living in campus (n=979)	696 (41.3)	283 (16.8)
Living (with family) (n=669)	450 (26.7)	219 (13)
Other (n=36)	29 (1.7)	7 (0.4)
Grade point average		
10-15 (n=640)	454 (27)	186 (11)
16-20 (n=1044)	721 (42.8)	323 (19.2)

Discussion

In the present study, the prevalence of chronic pain in nursing students was found to be 30.2%. The most common areas which were affected by pain were, in descending order, the head, the abdomen, and the back. Most of the students reported the cause of their chronic pain to be unknown. Kodana *et al.,* report the prevalence of chronic pain in nursing students to be 79.2%.(3) A study of medical students reports that 88.5% of the subjects had suffered from musculoskeletal pain in at least one location.(13) In the study of Abledu *et al*., 70.1% of the nursing students had suffered from musculoskeletal disorders in the past 12 months and 56.1% had been affected by the incapacitating consequences of pain. 44.6% of the students complained of pain in their necks, backs, lower backs, and wrists.(14) In a study of the prevalence of chronic pain in 1011 adults in Brazil, the results showed that the source of pain in 15% of the population was unknown. In descending order, the body parts most affected by pain were the upper parts, heads and necks, and lower parts.(15) Differences in the prevalence and locations of chronic pain can be attributed to differences in the study populations (race and ethnicity), designs, sample sizes, and other disorders and contributory factors. Moreover, stress and academic overload, sitting in classroom chairs for long periods, and poor sitting posture while studying are among the risk factors in college students' musculoskeletal disorders.(16)

The results of the present study showed that the highest frequency of chronic pain among nursing students belonged to the 29 and over age group and that there was a significant relationship between the students' chronic pain and age. According to the study of Houde *et al.,* there is a significant positive relationship between pain and disability on the one hand and age on the other in individuals with back pain. The relationship is more significant in the youth than in the elderly.(17) However, in the study of UCEL and TORUN, where the majority of the participants were college students under 30, the relationship between the students' age and perceived severity of pain was found to be insignificant.(18) Studying the prevalence of chronic back pain among nurses in Jordan, Alhadidi *et al*., report that 82.5% of nurses aged 35 suffer from chronic back pain.(19) However, inconsistency in results can be due to selection of sample, study settings and variation in the area and population of different countries. Also, the inconsistency between these research results may be due to the researchers' use of different pain scales. Yet, the findings of studies confirm the increasing prevalence of chronic pain in various populations and age groups.(4) Chronic pain is not limited to older adults; Mill's review study shows that chronic pain is prevalent among adolescents and young adults.(20) Moreover, it has been found that the elderly gradually adapts to performing their daily activities despite their chronic pain.(21)

The findings of the present study show that there is a significant relationship between pain and marital status. The results of the study of Mawdsley *et al.,* in England show that the presence of patients' spouses in chronic pain management programs increases patients' satisfaction and improves their perception of self-management behaviors and communication skills.(22) In their study of marital relationships and psychological resilience in patients with chronic pain in the U.S., Wade et al., report that the subjects who had lost their spouses felt less alienation, fear, anger, and depression than the other (married, divorced, and single) subjects. Satisfactory marital relationships help patients tolerate their disease more easily and feel less incapacitated.(23) On the other hand, poor marital adjustment or singlehood can increase stress and make patients disinclined to exercise health behaviors, including seeking appropriate medical care, which will aggravate their pain and suffering.(20)

The findings of the present study showed that there was a significant relationship between the nursing students' education and chronic pain.

Most of the nursing students in the present study were undergraduates who attributed their chronic pain to unknown causes, migraine, and spinal disorders, in descending order. In the study of Vujcic *et al*., the prevalence of back pain in medical students in the 5th semester of their studies and above was higher than in others. The researchers mention the participation of medical students of higher years in practical training, their poor posture, and failure to exercise as the reasons for the higher incidence of pain in this group.(24) According to a study, musculoskeletal pain in medical students correlates with their clinical activities, the number of hours they use computers, history of trauma, family health history, and BMI.(25) In Iran, clinical training courses for undergraduate and postgraduate nursing students start from their second semester. During their clinical raining, nursing students should care for their patients, which entails remaining standing for long periods. Also, at school, they have to spend long hours sitting while attending classes or studying. Poor posture during clinical practice and long hours of sitting in classes and libraries can account for the occurrence of musculoskeletal pain in nursing students.

One of the limitations of the present study is that personal differences, e.g. different physical, emotional, psychological, and family conditions, between the nursing students may have affected the findings of the study. In addition, the fact that few studies have addressed chronic pain in nursing students and the factors associated with it restricted the possibility of comparing the findings of the present study with those of other similar studies. Another limitation of the present study is its use of a self-report questionnaire: it was possible that the nursing students would not provide honest answers. To minimize the impact of response bias, the researchers informed the participants about the objectives and applications of the study and distributed the questionnaires at appropriate times and places by prior arrangement with the students. Also, in the present study, the collected data did not include the participants' BMIs, tobacco use, or exercise habits. Therefore, it is suggested that future studies include these variables. Also, one school was randomly selected from each geographic region through sampling; it would have been better if two or more schools had been selected.

Conclusion. The findings of the study show that, though they are a young population, nursing students are at risk of suffering chronic pain and the negative consequences associated with it. It is, therefore, necessary that nursing students be educated about the contributing factors in chronic pain, good posture for studying, and physical activities. There is also need for educational programs to raise students' awareness of the impact of pain on their mental health. Equipping dormitories with proper facilities, e.g. massage chairs, and providing counseling services for students who suffer from chronic pain can improve the physical and mental health of the students. These findings can help university authorities take the necessary measures toward prevention and management of pain in students who suffer from chronic pain, thereby helping the students' academic performance and success. It is suggested that more studies be conducted in other countries to investigate the factors which contribute to nursing students' chronic pain to add to the existing knowledge.

Acknowledgements: This article is the result of a research project registered at Shiraz University of Medical Sciences, Iran. The authors would like to thank the nursing students who participated in the study.

References

1. Kim HJ, Boo S, Meeker TJ. Pain Prevalence, Management and Interference Among University Students in South Korea: An Exploratory Cross-Sectional Study. J. Pain Res. 2021; 14:2423.
2. Raffaeli W, Tenti M, Corraro A, Malafoglia V, Ilari S, Balzani E, Bonci A. Chronic pain: what does it mean? A review on the use of the term chronic pain in clinical practice. J. Pain Res. 2021; 14:827.
3. Kodama Y, Fukahori H, Tse M, Yamamoto-Mitani N. Pain Prevalence, Pain Management, and the Need for Pain Education in Healthcare Undergraduates. Pain Manag. Nurs.2021. 22(3):408-13.
4. Silva CD, Ferraz GC, Souza LA, Cruz LV, Stival MM, Pereira LV. Prevalence of chronic pain in nursing undergraduate students. Texto Contexto Enferm. 2011; 20:519-25.
5. Amelot A, Mathon B, Haddad R, Renault MC, Duguet A, Steichen O. Low back pain among medical students: a burden and an impact to consider! Spine, 2019; 44(19):1390-15.
6. Dighriri YH, Akkur MA, Alharbi SA, Madkhali NA, Matabi KI, Mahfouz MS. Prevalence and associated factors of neck, shoulder, and low-back pains among medical students at Jazan University, Saudi Arabia: A cross-sectional study. J. Family Med. Prim. Care. 2019; 8(12):3826.
7. Silva AL, Smaidi K, Pires MH, Pires OC. Prevalence of chronic pain and associated factors among medical students. Rev. Dor. 2017. 18:108-11.
8. Kheiry F, Rakhshan M, Shaygan M. The prevalence and associated factors of chronic pain in nurses Iran. Rev. Latinoam. Hipertens. 2019; 14(1):21-5.
9. Dehghan, M., A. Ahmadi, and S. Jalili, A study of pain and anxiety/depression severity on patients with nonspecific chronic low back pain. J. Shahrekord Univ. Med. Sc. 2018; 20(3).
10. Björnsdóttir, S., S. Jónsson, and U. Valdimarsdóttir, Functional limitations and physical symptoms of individuals with chronic pain. Scan. J. Reumatol. 2013; 42(1):59-70.
11. Davis KM, Schwarz JE. The Prevalence and Impact of *Chronic Pain in Baccalaureate Nursing Students.* Williams Honors College, Honors Research Projects*. 297;* 2016.
12. Kahl C, Cleland JA. Visual analogue scale, numeric pain rating scale and the McGill Pain Questionnaire: an overview of psychometric properties. Phys. Ther. Rev. 2005; 10(2):123-8.
13. Hasan MM, Yaqoob U, Ali SS, Siddiqui AA. Frequency of musculoskeletal pain and associated factors among undergraduate students. Case Rep. Clin. Med. 2018; 7(2):131-45.
14. Abledu, J.K. and E.B. Offei, Musculoskeletal disorders among first-year Ghanaian students in a nursing college. Afr. Health Sci. 2015. 15(2):444-9.
15. Souza JB, Grossmann E, Perissinotti DM, Oliveira Junior JO, Fonseca PR, Posso ID. Prevalence of chronic pain, treatments, perception, and interference on life activities: Brazilian population-based survey. Pain Res. Manag. 2017:4643830.
16. Ekpenyong CE, Daniel NE, Aribo E. Associations between academic stressors, reaction to stress, coping strategies and musculoskeletal disorders among college students. Ethiop. J. Health Sci. 2013; 23(2):98-112.
17. Houde F, Cabana F, Léonard G. Does age affect the relationship between pain and disability? A descriptive study in individuals suffering from chronic low back pain. J. Geriatr. Phys. Ther. 2016; 39(3):140-5.
18. Yücel H, Torun P. Incidence and risk factors of low back pain in students studying at a health university. Bezmialem Sci.2016; 4:12-8.
19. Al-Hadidi F, Bsisu I, Haddad B, AlRyalat SA, Shaban M, Matani N, et al.The prevalence of low back pain among female hospital staff at childbearing age. Peer J. 2020; 8: e9199.
20. Mills, S.E., K.P. Nicolson, and B.H. Smith, Chronic pain: a review of its epidemiology and associated factors in population-based studies. Br. J. Anaesth. 2019; 123(2):e273-e283.
21. Boggero IA, Geiger PJ, Segerstrom SC, Carlson CR. Pain intensity moderates the relationship between age and pain interference in chronic orofacial pain patients. Exp. Aging Res. 2015; 41(4):463-74.

22. Mawdsley L, Twiddy H, Longworth M. Involvement of family and friends in pain management interventions. J Obs. Pain Med. 2015; 1(5):12-21.
23. Wade JB, Hart RP, Wade JH, Bajaj JS, Price DD. The relationship between marital status and psychological resilience in chronic pain. Pain Res. Treat. 2013: 928473.
24. Vujcic I, Stojilovic N, Dubljanin E, Ladjevic N, Ladjevic I, Sipetic-Grujicic S. Low back pain among medical students in Belgrade (Serbia): a cross-sectional study. Pain Res. Manag. 2018: 8317906
25. Alshagga MA, Nimer AR, Yan LP, Ibrahim IA, Al-Ghamdi SS, Al-Dubai SA. Prevalence and factors associated with neck, shoulder and low back pains among medical students in a Malaysian Medical College. BMC Res. Notes, 2013; 6(1):244.

Original article

Social Consequences of the COVID-19 Pandemic. A Systematic Review

Pouya Hosseinzadeh[1,5]
https://orcid.org/0000-0003-3334-3205
Mordali Zareipour[2]
https://orcid.org/ 0000-0002-1039-896X
Esfandyar Baljani[3,5]
https://orcid.org/0000-0002-9699-8527
Monireh Rezaee Moradali[4,5]
https://orcid.org/0000-0002-6450-7578

Social Consequences of the COVID-19 Pandemic. A Systematic Review

Abstract

Objective. To provide a systematic review of the social consequences of COVID-19 pandemic. **Methods.** In the present study, articles indexed in Persian and Latin databases (Web Of Science, Scopus, PubMed, Embase, Google Scholar and Magiran). 43 documents published in the last 3 years in Persian or English language were reviewed. The research steps were performed according to PRISMA writing standard and the quality assessment was done by two researchers independently with Newcastle Ottawa Scale tools for observational studies according to the inclusion criteria. **Results.** Measures to break the chain of virus transmission and to control the COVID-19 pandemic have caused major problems in the economic, social, political and psychological spheres and have affected billions of people worldwide. The COVID-19 pandemic crisis has caused widespread unrest in society and unprecedented changes in lifestyle, work and social interactions, and increasing social distance has

1 Student Research Committee.
Email: m1997hg@gmail.com
2 Assistant Professor. Khoy University of Medical Sciences, Khoy, Iran. Email: z.morad@yahoo.com.
3 Ph.D. Assistant Professor.
Email: baljanies@gmail.com
4 Ph.D. Professor.
Email: monir.rezaee@yahoo.co.uk.
Corresponding author.
5 Urmia Branch, Islamic Azad University, Urmia, Iran.

Conflicts of interest: None.

Receipt: October 27, 2021.

Approved: March 3, 2022.

How to cite this article: Hosseinzadeh P, Zareipour M, Baljani E, Rezaee Moradali M. Social Consequences of the COVID-19 Pandemic: A Systematic Review. Invest. Educ. Enferm. 2022; 40(1):e10.

DOI: https://doi.org/10.17533/udea.iee.v40n1e10.

Investigación y Educación en Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

severely affected human relations. **Conclusion.** The COVID-19 pandemic has social consequences in certain groups can exacerbate their unfavorable situation. Special groups in crisis situations should be given more attention, and clear and precise policies and programs should be developed to support them

Descriptors: COVID-19, coronavirus, pandemics, impacts on health, systematic review.

Consecuencias sociales de la pandemia de COVID-19. Una revisión sistemática

Resumen

Objetivo. Realizar una revisión sistemática de las consecuencias sociales de la pandemia de COVID-19. **Métodos.** En el presente estudio se revisaron los artículos indexados en bases de datos latinas y persas (Web Of Science, Scopus, PubMed, Embase, Google Scholar y Magiran), luego de lo cual se recuperaron 43 documentos publicados en los últimos 3 años en persa o en inglés. Los pasos de la revisión se realizaron según el protocolo PRISMA y, para reducir el sesgo en la evaluación de la calidad, los artículos seleccionados se evaluaron cualitativamente por dos investigadores de forma independiente con la herramienta de Newcastle Ottawa Scale. **Resultados.** Las medidas para romper la cadena de transmisión del virus y para el control de la pandemia de COVID-19 han causado importantes problemas en las esferas económica, social, política y psicológica y han afectado a miles de millones de personas en el mundo. La crisis por la pandemia ha provocado un malestar generalizado en la sociedad y cambios sin precedentes en el estilo de vida, el trabajo y las interacciones sociales. El aumento de la distancia social ha afectado gravemente las relaciones humanas. **Conclusión.** La pandemia de COVID-19 tiene consecuencias sociales que pueden agravar la situación desfavorable de grupos vulnerables. Se debe brindar más atención a los colectivos especiales en situaciones de crisis y desarrollar políticas y programas claros y precisos para apoyarlos.

Descriptores: COVID-19, coronavirus, pandemias, impactos en la salud, revisión sistemática.

Consequências sociais da pandemia de COVID-19. Uma revisão sistemática

Resumo

Objetivo. Realizar uma revisão sistemática das consequências sociais da pandemia de COVID-19. **Métodos.** No presente estudo, os artigos indexados nas bases de dados latinas e persas (Web Of Science, Scopus, PubMed, Embase, Google Scholar e Magiran) foram revisadas, logo se recuperaram 43 documentos publicados nos últimos 3 anos em persa ou em inglês. Os passos da revisão se realizaram segundo o protocolo PRISMA e, para reduzir o viés na avaliação da qualidade, os artigos selecionados foram avaliados qualitativamente por dois investigadores de forma independente com a ferramenta de Newcastle Ottawa Scale. **Resultados.** As medidas para romper a cadeia de transmissão do vírus e para o controle da pandemia de COVID-19 há causado importantes problemas nas esferas económica, social, política e psicológica e há afetado a milhares de pessoas no mundo. A crise pela pandemia de COVID-19 há provocado um mal-estar generalizado na sociedade e câmbios sem precedentes no estilo de vida, no trabalho e nas interações sociais. O aumento da distância social há afetado gravemente às relações humanas. **Conclusão.** A pandemia de COVID-19 tem consequências sociais que podem agravar a situação desfavorável de grupos vulneráveis. Se deve brindar mais atenção aos coletivos especiais nas situações de crise e desenvolver políticas e programas claros e precisos para apoiá-los.

Descritores: COVID-19, coronavirus, pandemias, impactos na saúde, revisão sistemática.

Introduction

In late December 2019, an outbreak of a new viral disease belonging to the coronavirus family was reported in Wuhan, the capital of Hubei, China.(1) The new COVID-19 belongs to the same group of coronaviruses as acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS), which has caused two outbreaks in recent years.(2) The new virus is mainly transmitted by respiratory droplets and contact(3) and affects all age groups.(4) On December, 2021, due to the rapid spread of the virus and the increase in infections, followed by alarming death tolls from the disease was declared an epidemic by the World Health Organization.(5) According to the WHO, as of December 6, 2021, 269 559 230 people worldwide have been infected and 530 5337 people have died from the virus. Also in Iran, as of December 6 in 2021, 6 137 821 people have been infected and 130 277 people have died due to this virus.(6,7)

The COVID-19 pandemics crisis has caused great unrest in society and unprecedented changes in lifestyle, work and social interactions.(8) The implementation of policies such as social distancing and the closure of gathering and interaction centers such as parks, cafes, shrines, schools, universities, etc., has had certain social consequences.(9) Prolonged stay at home, in a society with a patriarchal lifestyle, will increase the pressure for women to do housework. The economic and psychological dimensions of COVID-19 also affect family members. The issue of increasing domestic violence, including child abuse, spousal abuse, elder abuse, and disability abuse following the COVID-19 pandemics crisis, is such that the Secretary-General of the United Nations has also expressed concern.(10) The closure of schools and universities will deprive millions of children, teenagers and young people of social educational activities for a long time, after which it may not be easy to compensate.(11,12) Travel restrictions by different countries have reduced social relations in external areas and led to the isolation of individuals. Because COVID-19 affects all aspects of human life, it has increased divorce and reduced marriage in many countries.(13) In couples' lives, we have witnessed a decrease in marital relationships due to fear of contracting or transmitting the disease.(14) COVID-19 has also challenged and damaged public transport.(15,16)

The COVID-19 greatly affects people's lives. Everyone in the world directly or indirectly faces the severe consequences of this disease. Due to severe isolation and cessation of some social affairs, this disease causes problems such as social anxiety, panic due to insecurity, economic recession and severe psychological stress, which requires coordinated efforts to prevent and control them, and people should follow the advice and the suggestions of government officials and the World Health Organization to make the necessary and at the same time contrary to the internal desire in their daily plan.(17) Given that previous studies have evaluated the psychological and social consequences of other respiratory illnesses; few studies have been performed to evaluate the results of the current epidemic of COVID-19. Therefore, this review study will be conducted with the aim of estimating the social consequences of COVID-19 in order to identify them and take the necessary preventive measures to reduce the problems caused by these consequences. The present study sought to answer the following question: What are the social consequences of COVID-19 disease?

Methods

Search strategy. All stages of this research were performed based on the writing standard of systematic studies, PRISMA meta-analysis. The study population in this study included articles on the social consequences of COVID-19 that were indexed on one of the Internet sites. The Web of Science, Scopus, PubMed, Embase, and Magiran databases were searched as international databases, and the Google Scholar search engine was searched in Persian and English between 2000 and 2020. To find related articles in Persian and English language databases, the words searched in line with the research topic and based on mesh and syntax were the following items that were combined using AND and OR operators. The searching strategy used in Medline was: "(COVID-19[tiab] OR Coronavirus[tiab] OR Coronaviruses[tiab] OR Deltacoronavirus[tiab] OR Deltacoronaviruses[tiab] OR "Munia coronavirus HKU13"[tiab] OR "Coronavirus HKU15"[tiab] OR (Coronavirus[tiab] AND Rabbit[tiab]) OR "Rabbit Coronavirus*" [tiab] OR (Coronaviruses[tiab] AND Rabbit[tiab]) OR "Bulbul coronavirus HKU11"[tiab] OR "Thrush coronavirus HKU12"[tiab] OR ("Coronavirus 229E"[tiab] AND Human[tiab]) OR ("Coronavirus NL63"[tiab] AND Human[tiab]) OR "Middle East Respiratory Syndrome Coronavirus"[tiab] OR "SARS Virus"[tiab]) AND ("Social Behavior"[tiab] OR (Behavior[tiab] AND Social[tiab]) OR (Behaviors[tiab] AND Social[tiab]) OR "Social Behaviors"[tiab] OR "Competitive Behavior"[tiab] OR "Cooperative Behavior"[tiab] OR Self-Control[tiab] OR "Social Adjustment"[tiab] OR "Social Distance"[tiab] OR "Social Isolation"[tiab] OR "Social Skills"[tiab] OR "Social Stigma"[tiab] OR (Psychology[tiab] AND Social[tiab]))".

Selection of studies. In total, in this study, systematic review with the above keywords was initially studied in 912 articles and reports, protocols by reputable health organizations and considering the entry and exit criteria of articles in the relevant databases. After studying the titles and abstracts of articles by the authors of the article and removing similar and unrelated items, the relevant items were selected as research. Due to the widespread and increasing prevalence of the disease and the change in the statistics related to the prevalence, the statistics presented in this study are until July 23, 2020. Criteria for selecting articles are: (i) Descriptive, analytical, interventional and review articles related to the last 5 years; (ii) Persian and English language articles published in scientific research journals inside and outside the country, the full text of which was available; and, (iii) Articles related to the study of the social consequences of COVID-19.

Criteria for deleting articles were: articles that did not have a full text, articles that did not have a clear implementation method, and articles that focused solely on the social consequences of the disease. To review the articles obtained in the search of databases, were evaluated and evaluated according to the inclusion and exit criteria in the working method, four research colleagues participated. After reviewing the inclusion and exclusion criteria of the study, 43 articles and 4 protocols and reports in accordance with the above criteria entered the final quality assessment stage (Figure1).

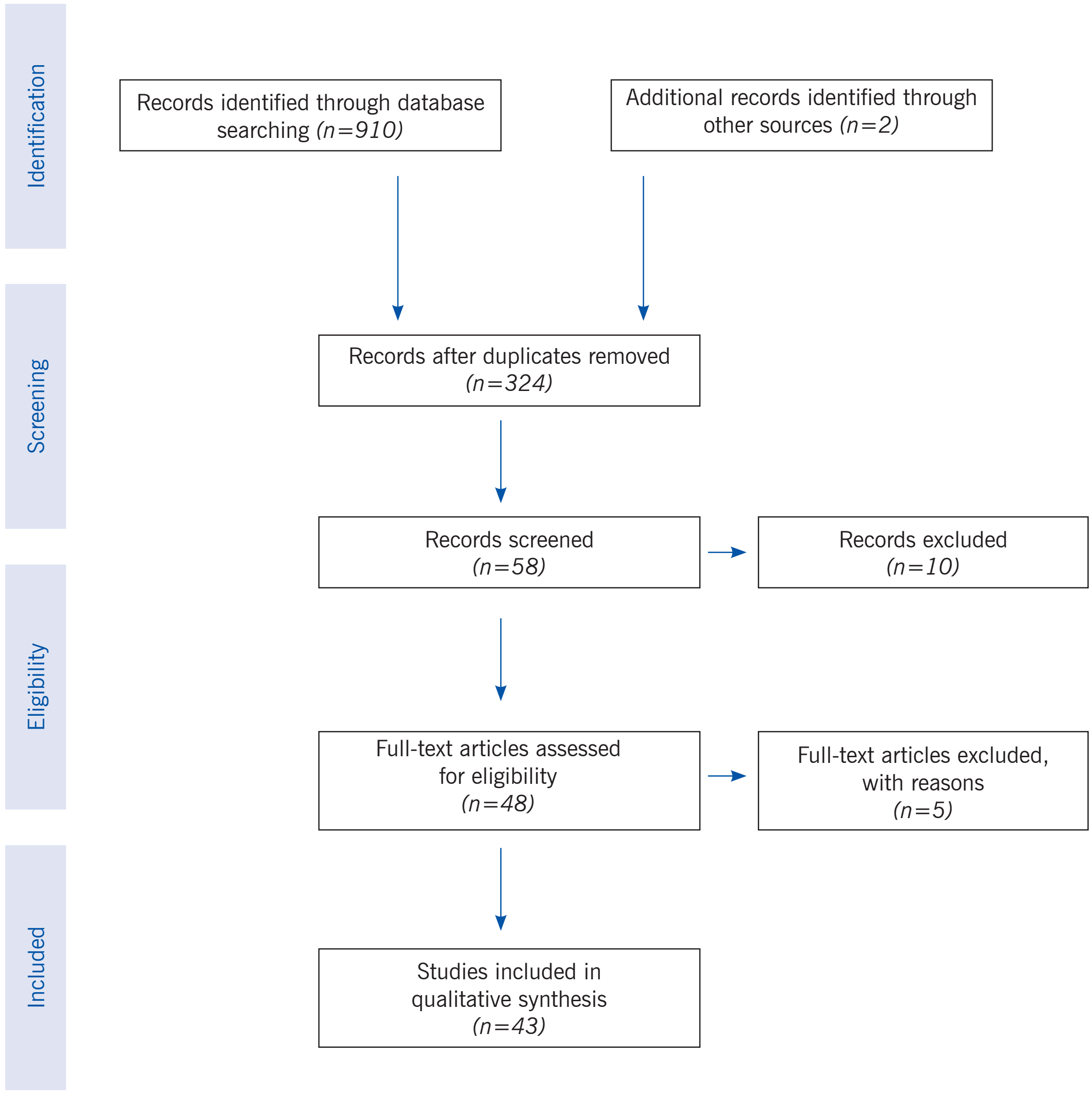


Figure1. The flowchart describing the study design process

Quality control. The quality of the papers selected by the two individuals was assessed independently using the Newcastle Ottawa Scale (NOS). This scale examines articles in terms of selection process (including four sections: sample expediency and sample size, non-response and measurement tools, comparability (control of confounders and influencing factors) and results (evaluation of results and statistical tests). Based on this scale, articles are rated from zero (weakest study) to 10 (strongest study). In this study, studies that scored above 4 were considered as quality studies. Therefore, according to the quality results of the reviewed articles, all articles selected at this stage had a score higher than 4 (optimal level).

Extracting the data. After evaluating the quality, to extract data from the text of articles eligible to enter to the study of two researchers independently by the researcher form, information about each article by name of authors, year of publication, type of research, place of research, Sample size and specificity of samples, standardization of research tools, main findings were extracted. In case of need for review and doubt in the method of reviewing articles, the help of a third researcher was sought (Table1).

Results

In late 2019, the world faced a global crisis called COVID-19, which was a threatening epidemic. In addition to increasing the incidence and mortality of this epidemic, it caused significant other economic, social, political, and psychological problems. Social isolation by quarantining billions of people at home to disrupt the virus transmission chain has created many crises in various dimensions,(18) here are some of them:

Scope of knowledge and education. COVID-19 has disrupted students' lives in different ways and it has provided anxious times for students and parents.(19) According to UNESCO, more than 1.5 billion students in about 165 countries have been affected by the restrictions on schools and universities. As a result, schools, colleges and universities were forced to turn to online learning. This has caused students to continue their education at home.(20) Closing schools and accepting distance education may negatively affect students' learning through four main channels: spending less time learning, stress symptoms, changes in how students interact, and lack of motivation to learn. Most formal child learning takes place in schools, and closing schools and moving to a distance learning environment may cause children to spend less time learning.(21) Students who stay home because of COVID-19 are more likely to develop acute stress, maladaptation, and PTSD. The possibility of dropping out of school due to mental health problems also increases.(22) Attendance at schools increases the interaction between students and teachers and strengthens social skills and increases self-esteem and other skills necessary for the social environment. However, due to quarantine proceedings and the closure of schools, these social interactions have decreased.(21) Also, some teachers or students are not familiar enough with the world of the Internet and distance education, and this has disrupted the educational process. On the other hand, due to the lack of access to online education tools for all students such as phones or laptops or the lack of Internet access in less developed areas, problems in distance education have been created for them.(23)

Family scope. With the announcement of the epidemic of COVID-19 and the application of various restrictions in the community, some jobs were closed, which increased the financial and economic burden on the family and increased the couple's dissatisfaction, as well as disputes and even divorce. Also, due to the constraints and economic problems caused by COVID-19, weddings and bonds between people have decreased.(24,25) With the closure of schools and the presence of students in homes and the closure of businesses due to social constraints, it has increased psychological problems in families, abuse and violence between family members.(26) This has a very important impact on people's lifestyle, the short-term consequences of which can be seen in health. These restrictions have led to decreased physical activity, weight gain, changes in diet, changes in smoking and alcohol consumption habits, changes in lifestyle, and ultimately quality of life and well-being.(27, 28) Also, different degrees of quarantine measures have reduced people's access to healthy food, inequality between communities, increased anxiety and stress, and impaired sleep quality. Some people also used drugs and alcohol to alleviate the fear and anxiety of COVID-19.(29)

Judicial scope. By imposing social distancing and various restrictions, individuals may resist these commands. The increasing burden of social distance in daily life has led to violence, bad temper, conflict, theft, murder, suicide, sabotage, and disregard for the law.(30) Social distance at the court level has also disrupted the proceedings and the presence of parties and witnesses in court.(31) The sale of illicit drugs, the distribution and consumption of drugs and alcohol, cybercrime, as well as the sale and purchase of firearms are among the crimes that are on the rise during COVID-19.(32) The outbreak of COVID-19 and the need for social isolation have also hampered the normal process of prisons. The temporary release of many prisoners in some countries has caused anxiety at the community level, and due to the lack of adequate space for solitary confinement, the possibility of increasing the incidence of COVID-19 among prisoners has become even more significant. Also, in some countries, the possibility of COVID-19 disease is higher among prisoners due to lack of adequate hygiene.(33)

Sexual scope. Anxiety about the state of the world, along with constant exposure to images of illness and death, has severely affected everyone's emotional stability. Daily turmoil, restriction of freedom and loss of sense of usefulness in society create a feeling of helplessness and overload in human beings. This has also affected the sexual sphere. Fear of these conditions has reduced physical contact in couples from simple kissing to full sexual intercourse and has weakened the bond between husband and wife.(34) Further depression and anxiety can reduce the level of sexual desire. With the closure of schools and the constant presence of children at home, sexual relations between individuals have also been overshadowed.(35) With the restrictions imposed, the tendency to have sex online has increased. Fear of infection has led single people to masturbate, have sex on the phone, and use of sexual means, which in turn has increased their desire for pornography and visits to pornographic sites and movies.(22,36)

Scope of transportation. Restrictions imposed by the government have halted public transport, restricted travel and activities abroad. The change of direction to personal transportation by individuals has intensified traffic on the roads and reduced the overall air quality in the urban environment. With the application of social distance, we are witnessing an increase in queues at bus and metro stations.(37,38) Air travel has also decreased significantly. COVID-19 has also led to the closure of many transportation agencies around the world due to a sharp drop in demand and a heavy economic burden on the people and the government. Violations and accidents on the road and in the city have also increased due to the use of private vehicles by the people.(16)

Cyberspace scope. This epidemic has played an important role in disseminating information in a news cycle.(39) The COVID-19 epidemic has not only posed significant challenges to the health care system worldwide, but has also played an important role in increasing rumors, deception and misinformation about the disease, its consequences, prevention and treatment. With so much news coming from different sources, there are many concerns about fake news. People are constantly following the news of COVID-19 and may experience high anxiety while doing things.(40) Comprehensive media exposure during the 24-hour news cycle can also lead the viewer to inaccurate and threatening information. These stress reactions may also have long-term consequences for physical and mental health.(41) It may even reduce the function of the immune system and upset the balance of their natural physiological mechanisms.(42)

Discussion

The social effects of the changes resulting from the COVID-19 pandemic crisis are not yet well known. We know that due to the implementation of social distance policy, many of the usual activities of society in the economic, social and political spheres have been closed or suspended.(43) As a result, many people in areas such as business, family relationships, and education have experienced the changes and effects of this policy. Many sectors were forced to adjust their workforce and increase the number of unemployed to reduce costs.(44) The heavy economic burden and unemployment caused by the COVID-19 epidemic have caused anxiety thoughts, anxiety, and ultimately an increase in crimes such as theft, strife, domestic disputes, fraud, and etc. To prevent such crimes, the government can adopt policies that can include livelihood support, management and organization of Internet businesses, and low-interest lending.(45) In the policy of social distancing, the situation of certain social groups such as immigrants, refugees and addicts has been ignored and the problems of this group of people have intensified.(46) Civil society and voluntary groups of people are full of initiatives, innovations and resources that can be used in times of crisis. Internet infrastructures and modern communication tools have transcended the physical limitations of communication and enabled virtual social interactions that can be used to maintain connections.(47)

It should be noted that the lack of management and monitoring of the virtual world can impose irreparable damage on society in the long time.(3) Social distancing, despite its problems, has a significant impact on reduction of casualties from the disease and reducing its negative consequences, but ultimately it is the level of public trust in the government that ensures the success of policies and measures. It is necessary to provide more freedom of action for the media to provide accurate, transparent information in this regard. The development of information infrastructure, especially in the less developed regions of the country, must be seriously on the agenda. Necessary requirements for equipping students in need of teaching aids such as tablets.(11,48) The need for public transportation in any society is an indisputable need. Therefore, the government should take action to provide the desired service in accordance with social distance.(49) Increasing the number of public vehicles, regular disinfection and the use of social distance labels can revitalize this vital sector and meet the needs of the community and prevent pollution. Also, providing brochures and educational materials in public transportation can help reduce anxiety and increase public literacy.(16,50)

One must be careful about the social consequences of COVID-19 for certain groups. Ignoring this issue can cause COVID-19 to exacerbate the unfavorable situation of these groups. Groups such as addicts in crisis situations should be given more attention and clear and precise policies and programs should be developed to support this group. Immigrants and refugees also have their own circumstances, and their fate in the context of the COVID-19 pandemic crisis cannot be ignored. Doing all of the above means that a small part of the social issues created by the COVID-19 pandemic crisis require capacities of trust, cross-sectoral cooperation, coordination, transparency and joint action. Capacities that many of them may not have looked good under normal circumstances.(51,52)

Limitations of the study: In this study, due to the lack of proficiency of researchers in languages other than English and Persian, articles in other languages were excluded from the study, which can be a limitation of the study.

Conclusion: In this review study, the effect of coronavirus on some aspects of people's lives was briefly discussed. Unfortunately, in the current epidemic and control of the corona virus, while becoming a crisis of health in the world, it is considered as such that it still has various aspects. In recent months, the world has been going through one of the most severe crises in the field of health and without a doubt one of the most important consequences of its epidemic and social ills. In fact, anxiety factors related to the risk of contracting the disease, future employment status, and sources of income for individuals and families, as well as long-term quarantine, can be kept at home for a long time.

Implications of the results for nursing practice. Considering the psychological consequences of the COVID-19 outbreak, the design and planning of intervention and supportive strategies to reduce the negative effects are suggested. In fact, it is necessary to identify the factors that cause the danger to the psychological health of different people in the society in order to use appropriate treatment methods.

Table 1. Details of articles used in research findings

Subject	Authors	Place and year	Type study	Samples	Results	Reference
Social isolation in COVID-19: The impact of loneliness	Banerjee D, Rai M	2020 India	Review	12 Articles	Social constraints in the COVID-19 pandemic force individuals to adapt to isolation and increase the prevalence of violence in the family, depression, anxiety, post-traumatic stress disorder.	(18)
Education and the COVID-19 pandemic	Daniel J	2020 Canada	Review	13 Articles	In order to increase the capacity of distance education, schools and colleges should use asynchronous learning and a variety of homework. Student assessment helps teachers provide flexible ways to compensate for students' learning deficiencies.	(53)
Global impact of COVID-19 on education systems	Osman ME	2020 Oman	Review	7 Articles	The normalization of current emergency e-learning does not necessarily mean extending the restrictions on face-to-face training, but rather pointing to strategies that control the prevalence of online acceptance at the time of COVID-19. It will ultimately change the learning landscape in schools and higher education institutions.	(20)
Impact of Pandemic COVID-19 on Education in India	Kumar Jena P	2020 India	Review	7 Articles	COVID-19 has greatly influenced India's education sector, and despite many challenges, various opportunities have evolved. They have explored the possibility of distance learning using digital technologies to cope with the COVID-19 crisis.	(54)
Student assessment of online tools to foster engagement during the COVID-19 quarantine	Lima KR, das Neves BHS, Ramires CC, Dos, et al	2020 Brazil	Descriptive Cross section	50 Students	To promote dynamic learning, various online tools are used for simultaneous and asynchronous training and activities. The course was evaluated well by students and they identified the use of Lt, Zoom, and YouTube platforms as the preferred online tools in learning physiology.	(23)

Table 1. Details of articles used in research findings. (Cont.)

Subject	Authors	Place and year	Type study	Samples	Results	Reference
Risk and resilience in family well-being during the COVID-19 pandemic	Prime H, Wade M, Browne DT	2020 Canada	Review	110 Articles	Families face future threats due to the occurrence of COVID-19 in their relationships, laws, traditions and lifestyle, which can have major consequences for children's adjustment during this period. Some families will be more affected by previous circumstances (lower income families, mental health problems or special needs).	(24)
Decline in marriage associated with the COVID-19 pandemic in the United States	Wagner B, Choi K, Socius PC	2020 USA	Cross-sectional study	-	The number of marriages registered in 2020 is significantly lower than in the same period in 2019. It seems unlikely that the annual decline in marriages is due solely to the closure of government agencies that report marriage certificates.	(25)
Danger in danger: Interpersonal violence during COVID-19 quarantine	Mazza M, Marano G, Lai C, Janiri L, Sani G	2020 Italy	Review	17 Articles	During the outbreak of COVID-19, people faced an invisible and dark enemy and experienced disability. There is a need for programs aimed at preventing domestic violence and achieving an accurate assessment of several dimensions of abuse.	(26)
COVID-19 lockdown impact on lifestyle habits of Italian adults	Odone A, Lugo A, Amerio A, Borroni E, Bosetti C, et al	2020 Italy	Cross sectional	6003 Participants	We have acquired a set of database analysis and are confident that we will achieve our research goals with the right budget and access to rich data resources.	(27)
Dietary and Lifestyle Changes During COVID-19 and the Subsequent Lockdowns among Polish Adults	Górnicka M, Drywié ME, Zielinska MA, Hamułka J	2020 Netherlands	Cross sectional	2381 Participants	Achieving a healthy pattern was negatively correlated with age but positively associated with pre-pandemic overweight. Living in macroeconomic areas reduced the achievement of a healthy model and increased the unhealthy model.	(28)
COVID-19 lockdown and lifestyles-A narrative review	Doraiswamy MBBS S, Cheema S, Al Mulla A, Mamtani R, Doraiswamy S	2020 Qatar	Review	649 Articles	Most articles have highlighted the negative impact of lockout measures on each of the lifestyle factors in many parts of the world. Such trends can positively affect the outcome of chronic lifestyle-related diseases, such as obesity and diabetes.	(29)
Impact of social distancing during COVID-19 pandemic on crime	Mohler G, Bertozzi AL, Carter J, Short MB, Sledge D, Tita GE, et al	2020 USA	Cross sectional	-	Measures of social distance may affect the extent and distribution of crime. recent study shows that social distance has a significant effect on several specific types of crime, but the overall effect is significantly less than expected.	(30)
The Changes In Criminal Trial Proceedings During COVID-19	Dewa Gede Giri Santosa	2020 Indonesia	Review	26 Articles	The results of this study address various issues that need to be addressed in order to change the criminal proceedings in COVID-19, and include not only the principle of expediency, but also the principles of justice and legal certainty.	(31)

Table 1. Details of articles used in research findings. (Cont.)

Subject	Authors	Place and year	Type study	Samples	Results	Reference
COVID-19 Will Lead To Increased Crime Rates In India	Uppal P	2020 India	Review	11 Articles	The crime rate increases in such circumstances. To reduce it, the situation must be carefully monitored by law enforcement agencies. The past recession and changes in crime rates during and after the economic recovery were examined.	(55)
Corrections and Crime in Spain and Portugal during the COVID-19 Pandemic	Redondo S, Gonçalves RA, Nistal J, Soler C, Moreira JS, Andrade J, et al	2021 Spain	Cross sectional	225 Participants	The main mechanisms of COVID-19 transmission are the physical proximity between individuals and the shared use of contaminated equipment. Prisons must continue to maintain the most effective precautionary measures discussed in this article.	(33)
The impact of COVID-19 pandemic on pornography habits	Zattoni F, Gül M, Soligo M, Morlacco A, G, Collavino J, et al	2020 Italy	Review	43 Articles	The prevalence of COVID-19 has affected the use and consumption of pornography. After the national restriction, it was found that the search for online pornography and pornography related to the corona virus has increased.	(34)
COVID-19 and Sexuality: Reinventing Intimacy	Lopes GP, Vale FBC, Vieira I, da Silva Filho AL, Abuhid C, Geber S	2020 Brazil	Review	16 Articles	Social distance is still the best way to deal with COVID-19. It is recommended that couples living separately resume marital relationships, strengthening intimacy. A high-quality relationship is beneficial for physical, mental and sexual health. A chaotic and negative relationship causes stress and poor mental and sexual health.	(35)
Changes in Sexuality and Quality of Couple Relationship During the COVID-19	Panzeri M, Ferrucci R, Cozza A, Fontanesi L	2020 Italy	Cross sectional	124 Participants	The main reasons for the change in relationships in women seem to be concern, lack of privacy and stress. Even in participants with a high level of resilience, the negative aspects of locking up can affect the quality of sex.	(36)
Impact of the COVID-19 pandemic on the sexual behavior of the population.	Ibarra FP, Mehrad M, Di Mauro M, Peraza Godoy MF, et al	2020 Spain Italy Iran	Review	28 Articles	The impact of the Corona virus on the sexual life of individuals will be very important and in the coming months or years some relationships will change to some extent. Due to the many limitations of contact, the epidemic will negatively affect sexual behaviors.	(22)
Urban transport and COVID-19: challenges and prospects in low- and middle-income countries	Koehl A	2020 UK	Review	9 Articles	Cities have seen a steady decline in demand for transportation due to a combination of sustained economic crisis and changing work habits. This can lead to a change in behavior due to crowded spaces, especially public transportation.	(37)
Public transport during pandemic	Bandyopadhyay S	2020 India	Review	13 Articles	Previous activities and leisure have definitely challenged the way we learn. We have to educate ourselves in different ways and adopt our lifestyle accordingly. We must definitely go through the current difficult period and be ready to face any future challenges.	(38)

Table 1. Details of articles used in research findings. (Cont.)

Subject	Authors	Place and year	Type study	Samples	Results	Reference
COVID-19 and Public Transportation: Current Assessment, Prospects, and Research Needs	Tirachini A, Cats O	2020 Chile	Review	69 Articles	Research needs related to the effects of the epidemic crisis on public transport. Some research needs (restoring the ability of public transportation systems to play their social role) require immediate attention.	(16)
The COVID-19 social media infodemic	Cinelli M, Quattrociocchi W, Galeazzi A, Valensise CM, Brugnoli E, et al	2020 Italy	Review	52 Articles	Understanding the social dynamics between content-consuming operating systems and social networks is an important research topic, as it may help design more efficient epidemic models for social behavior and design more effective communication strategies tailored to critical situations.	(56)
A New Application of Social Impact in Social Media for Overcoming Fake News in Health	Pulido CM, Ruiz-Eugenio L, Redondo G, Villarejo B	2020 Spain	Review	56 Articles	Messages that are based on evidence of respectful and transformative social impact, overcome misinformation about health. These results help advance knowledge in overcoming fake health-related news shared on social media.	(57)
Impact of rumors and misinformation on COVID-19 in Social Media	Tasnim S, Hossain M, Mazumder H	2020 USA	Review	10 Articles	The mass media, health care organizations, community-based organizations, and other key stakeholders need to build strategic partnerships and create shared platforms to deliver credible public health messages.	(58)
Facebook Pages Of Alternative News Media And The Corona Crisis-A Computational Content Analysis	Boberg S, Quandt T, Schatto-Eckrodt T, Frischlich L	2020 Germany	Review	70 Articles	Alternative news media remained faithful to the message patterns do not spread blatant lies, they mostly share overly critical, even anti-systemic messages, and oppose the views of the mainstream news media and the political apparatus.	(59)
The novel coronavirus outbreak: Amplification of public health consequences by media exposure	Garfin D, Silver R, Psychology EH-H	2020 USA	Review	22 Articles	Constant exposure of the media to the crisis of society can lead to increased anxiety and stress reactions that lead to effects on the flow of health, and health-protective behaviors can lead to over-reliance on health care facilities.	(41)
The impact of COVID-19 epidemic declaration on psychological consequences: a study on active Weibo users	Li S, Wang Y, Xue J, Zhao N	2020 Swiss	Review	36 Articles	People care more about health and family and less about leisure and friends. The use of social media data may provide a timely understanding of the impact of public health emergencies on people's mental health during an epidemic.	(42)

References

1. Ahmed MZ, Ahmed O, Aibao Z, Hanbin S, Siyu L, Ahmad A. Epidemic of COVID-19 in China and associated psychological problems. Asian J. Psychiatr. 2020; 51:102092.
2. Zhang H-W, Yu J, Xu H-J, Lei Y, Pu Z-H, Dai W-C, et al. Corona virus international public health emergencies: implications for radiology management. Acad. Radiol. 2020; 27(4):463-7.
3. Zhao Y, Cheng S, Yu X, Xu H. Chinese public's attention to the COVID-19 epidemic on social media: observational descriptive study. J. Med. Internet Res. 2020; 22(5):e18825.
4. Lu L, Xiong W, Liu D, Liu J, Yang D, Li N, et al. New onset acute symptomatic seizure and risk factors in coronavirus disease 2019: a retrospective multicenter study. Epilepsia. 2020; 61(6):e49-e53.
5. World Health Organization. Coronavirus Disease (COVID-19) [Internet]. Geneva: WHO. Available from: https://www.who.int/health-topics/coronavirus#tab=tab_1
6. Deng R, Li J, Sringernyuang L, Zhang K. Drug abuse, HIV/AIDS and stigmatisation in a Dai community in Yunnan, China. Soc. Sci. Med. 2007; 64(8):1560-71.
7. COVID Live - Coronavirus Statistics – Worldometer [Internet]. 2022 [cited 13 Feb 2022]. Available from: https://www.worldometers.info/coronavirus/
8. Jeihooni AK, Arameshfard S, Hatami M, Mansourian M, Kashfi SH, Rastegarimehr B, et al. The effect of educational program based on health belief model about HIV/AIDS among high school students. Int. J. Pediatr-Mashhad. 2018; 6(3):7285-96.
9. Imani JH. Social impacts of the spread of coronavirus in Iranian society. Soc. Impact Assess. 2020; 1(1):87-103.
10. Kofman YB, Garfin DR. Home is not always a haven: The domestic violence crisis amid the COVID-19 pandemic. Psychol. Trauma. 2020; 12(S1):S199-S201.
11. Donohue JM, Miller E. COVID-19 and school closures. JAMA. 2020; 324(9):845-7.
12. Islam MA, Barna SD, Raihan H, Khan MNA, Hossain MT. Depression and anxiety among university students during the COVID-19 pandemic in Bangladesh: A web-based cross-sectional survey. PloS One. 2020; 15(8):e0238162.
13. Lebow JL. The challenges of COVID-19 for divorcing and post-divorce families. Fam. Process. 2020; 59(3):967-73.
14. Lehmiller JJ, Garcia JR, Gesselman AN, Mark KP. Less sex, but more sexual diversity: Changes in sexual behavior during the COVID-19 coronavirus pandemic. Leis. Sci. 2021; 43(1-2):295-304.
15. Shen J, Duan H, Zhang B, Wang J, Ji JS, Wang J, et al. Prevention and control of COVID-19 in public transportation: Experience from China. Environ. Pollut. 2020; 266:115291.
16. Tirachini A, Cats O. COVID-19 and public transportation: Current assessment, prospects, and research needs. J.Public Transp. 2020;22(1):1-21.
17. Singh J, Singh J. COVID-19 and its impact on society. Electron. Res. J. Soc. Sci. Humanit. 2020; 2(1):168-72.
18. Banerjee D, Rai M. Social isolation in COVID-19: The impact of loneliness. SAGE Publications Sage UK: London, England; 2020. p. 525-7.
19. Shawaqfeh MS, Al Bekairy AM, Al-Azayzih A, Alkatheri AA, Qandil AM, Obaidat AA, et al. Pharmacy students perceptions of their distance online learning experience during the COVID-19 pandemic: a Cross-Sectional Survey Study. J. Med. Educ. Curric. Dev. 2020; 7:2382120520963039.
20. Osman ME. Global impact of COVID-19 on education systems: the emergency remote teaching at Sultan Qaboos University. J. Educ. Teach. 2020; 46(4):463-71.
21. Di Pietro G, Biagi F, Costa P, Karpi-ski Z, Mazza J. The likely impact of COVID-19 on education: Reflections based on the existing literature and recent international datasets: Publications Office of the European Union Luxembourg; 2020.
22. Ibarra FP, Mehrad M, Mauro MD, Godoy MFP, Cruz EG, Nilforoushzadeh MA, et al. Impact of the COVID-19 pandemic on the sexual behavior of the population. The vision of the east and the west. Int. Braz J. Urol. 2020; 46:104-12.

23. Lima KR, das Neves B-HS, Ramires CC, dos Santos Soares M, Martini VÁ, Lopes LF, et al. Student assessment of online tools to foster engagement during the COVID-19 quarantine. Adv. Physiol. Educ. 2020; 44(4):679-83.
24. Prime H, Wade M, Browne DT. Risk and resilience in family well-being during the COVID-19 pandemic. Am. Psychol. 2020; 75(5):631.
25. Wagner BG, Choi KH, Cohen PN. Decline in marriage associated with the COVID-19 pandemic in the United States. Socius. 2020; 6:2378023120980328.
26. Mazza M, Marano G, Lai C, Janiri L, Sani G. Danger in danger: Interpersonal violence during COVID-19 quarantine. Psychiatry Res. 2020; 289:113046.
27. Odone A, Lugo A, Amerio A, Borroni E, Bosetti C, Carreras G, et al. COVID-19 lockdown impact on lifestyle habits of Italian adults. Acta Bio Medica: Atenei Parmensis. 2020; 91(9-S):87.
28. Górnicka M, Drywie ME, Zielinska MA, Hamułka J. Dietary and lifestyle changes during COVID-19 and the subsequent lockdowns among Polish adults: a cross-sectional online survey PLifeCOVID-19 study. Nutrients. 2020; 12(8):2324.
29. Doraiswamy S, Cheema S, Al Mulla A, Mamtani R. COVID-19 lockdown and lifestyles–A narrative review. F1000Research. 2021; 10:363.
30. Mohler G, Bertozzi AL, Carter J, Short MB, Sledge D, Tita GE, et al. Impact of social distancing during COVID-19 pandemic on crime in Los Angeles and Indianapolis. J. Crim. Justice. 2020; 68:101692.
31. Santosa DGG. The changes in criminal trial proceedings during COVID-19: challenges and problems. Indones. Law J. 2020;13(2):123-35.
32. Watson CW-M, Sundermann EE, Hussain MA, Umlauf A, Thames AD, Moore RC, et al. Effects of trauma, economic hardship, and stress on neurocognition and everyday function in HIV. Health Psychol. 2019; 38(1):33.
33. Redondo S, Gonçalves RA, Nistal J, Soler C, Moreira JS, Andrade J, et al. Corrections and Crime in Spain and Portugal during the COVID-19 Pandemic: Impact, Prevention and Lessons for the Future. Vict. Offender. 2020; 15(7-8):1156-85.
34. Zattoni F, Gül M, Soligo M, Morlacco A, Motterle G, Collavino J, et al. The impact of COVID-19 pandemic on pornography habits: a global analysis of Google Trends. Int. J. Impot. Res. 2020:1-8.
35. Lopes GP, Vale FBC, Vieira I, da Silva Filho AL, Abuhid C, Geber S. COVID-19 and sexuality: reinventing intimacy. Archiv. Sex. Behav. 2020; 49(8):2735-8.
36. Panzeri M, Ferrucci R, Cozza A, Fontanesi L. Changes in sexuality and quality of couple relationship during the COVID-19 lockdown. Front. Psychol. 2020; 11:2523.
37. Koehl A. Urban transport and COVID-19: challenges and prospects in low-and middle-income countries. Cities Health. 2020:1-6.
38. Bandyopadhyay S. Public transport during pandemic. Springer; 2020. p. 1755-6.
39. Kalichman SC, Simbayi LC, Kaufman M, Cain D, Cherry C, Jooste S, et al. Gender attitudes, sexual violence, and HIV/AIDS risks among men and women in Cape Town, South Africa. J. Sex. Res. 2005; 42(4):299-305.
40. Jung SJ, Jun JY. Mental health and psychological intervention amid COVID-19 outbreak: perspectives from South Korea. Yonsei Med. J. 2020; 61(4):271-2.
41. Garfin DR, Silver RC, Holman EA. The novel coronavirus (COVID-2019) outbreak: Amplification of public health consequences by media exposure. Health Psychol. 2020; 39(5):355.
42. Li S, Wang Y, Xue J, Zhao N, Zhu T. The impact of COVID-19 epidemic declaration on psychological consequences: a study on active Weibo users. Int. J. Environ. Res. Public Health. 2020; 17(6):2032.
43. Buzzi C, Tucci M, Ciprandi R, Brambilla I, Caimmi S, Ciprandi G, et al. The psycho-social effects of COVID-19 on Italian adolescents' attitudes and behaviors. Ital. J. Pediatr. 2020; 46(1):1-7.
44. Saladino V, Algeri D, Auriemma V. The psychological and social impact of COVID-19: new perspectives of well-being. Front. Psychol. 2020: 2550.
45. Boman JH, Gallupe O. Has COVID-19 changed crime? Crime rates in the United States during the pandemic. Am. J. Crim. Justice. 2020; 45(4):537-45.

46. Sieffien W, Law S, Andermann L. Immigrant and refugee mental health during the COVID-19 pandemic: Additional key considerations. Can. Fam. Physician. 2022 [cited 13 Feb 2022]. Available from: https://www.cfp.ca/news/2020/06/23/06-23-1
47. Oh S-H, Lee SY, Han C. The effects of social media use on preventive behaviors during infectious disease outbreaks: The mediating role of self-relevant emotions and public risk perception. Health Commun. 2021; 36(8):972-81.
48. Arnove RF. Imagining what education can be post-COVID-19. Prospects. 2020; 49(1):43-6.
49. Li L, Wu S, Wu Z, Sun S, Cui H, Jia M. Understanding family support for people living with HIV/AIDS in Yunnan, China. AIDS Behav. 2006; 10(5):509-17.
50. Fang Y, Nie Y, Penny M. Transmission dynamics of the COVID-19 outbreak and effectiveness of government interventions: A data-driven analysis. J. Med. Virol. 2020; 92(6):645-59.
51. Dubey MJ, Ghosh R, Chatterjee S, Biswas P, Chatterjee S, Dubey S. COVID-19 and addiction. Diabetes Metab. Syndr. 2020; 14(5):817-23.
52. Columb D, Hussain R, O'Gara C. Addiction psychiatry and COVID-19: Impact on patients and service provision. Irish J. Psychol. Med. 2020; 37(3):164-8.
53. Daniel SJ. Education and the COVID-19 pandemic. Prospects. 2020; 49(1):91-6.
54. Jena PK. Impact of pandemic COVID-19 on education in India. Int. J Curr. Res. 2020; 16(2):2020-2021.
55. Uppal P. Covid-19 will Lead to increased crime rates in India. Int. Res. Granthaalayah. 2020; 8(4):72-8.
56. Cinelli M, Quattrociocchi W, Galeazzi A, Valensise CM, Brugnoli E, Schmidt AL, et al. The COVID-19 social media infodemic. Sci. Rep. 2020; 10(1):1-10.
57. Pulido CM, Ruiz-Eugenio L, Redondo-Sama G, Villarejo-Carballido B. A new application of social impact in social media for overcoming fake news in health. Int. J. Environ. Res. Public Health. 2020; 17(7):2430.
58. Tasnim S, Hossain MM, Mazumder H. Impact of rumors and misinformation on COVID-19 in social media. J. Prev. Med. Public Health. 2020; 53(3):171-4.
59. Boberg S, Quandt T, Schatto-Eckrodt T, Frischlich L. Pandemic populism: Facebook pages of alternative news media and the corona crisis--A computational content analysis [Internet]. 2020; arXiv preprint arXiv:200402566.

Psychosocial Adjustment to Illness among HIV-Positive People from Buenos Aires, Argentina

Original article

Carlos Jesús Canova Barrios[1]
https://orcid.org/0000-0003-3901-6117

UNIVERSIDAD
DE ANTIOQUIA
1803

Psychosocial Adjustment to Illness among HIV-Positive People from Buenos Aires, Argentina

Abstract

Objective. To analyze the process of psychosocial adjustment to illness in a sample of people living with the Human Immunodeficiency Virus from Buenos Aires, Argentina. **Methods.** Cross-sectional analytical study. The sample consisted of 144 HIV-positive people chosen by simple random sampling. The PAIS-SR questionnaire was used to measure the Psychosocial Adjustment process, which is made up of 46 items organized into 7 domains, whose final score ranges between 0 and 100, interpreted so that the higher the score, the worse the psychosocial adjustment process. **Results.** The respondents reported were mostly male (82.63%), single (61.80%), with university studies (50.00%), without children (74.30%), and with a steady job (88.19%); the mean age of the participants was 43.8 years. The median global score was 51.4 (IQR: 12). The domains with the worst perception of

---

[1] Nurse, Ph.D in Medical Sciences. Professor, Universidad de Ciencias Empresariales y Sociales, Buenos Aires (Argentina).
Email: Carlos.canova1993@gmail.com

Conflicts of interest: None.

Receipt: March 13, 2021.

Approved: March 3, 2022.

How to cite this article: Canova-Barrios C. Psychosocial Adjustment to Illness among HIV-Positive People from Buenos Aires, Argentina. Invest. Educ. Enferm. 2022; 40(1):e11.

DOI: https://doi.org/10.17533/udea.iee.v40n1e11.

psychosocial adjustment were: Health care orientation (Me: 56, IQR: 20), extended family relationship (Me: 55, IQR: 20), and Sexual relationship (Me: 54, IQR: 14), while those who had a better perception of adjustment were: Domestic environment (Me: 48, IQR: 8), Psychological distress (Me: 48, IQR: 17), Social environment (Me: 50, IQR: 18) and Vocational environment (Me: 50, IQR: 12). It was found that patients with a poor psychosocial adjustment process had low adherence to treatment, higher frequency of smoking, and sedentary lifestyle ($p<0.001$), while male sex, older age, and employment were related to a better psychosocial adjustment process ($p<0.001$). **Conclusion.** The process of psychosocial adjustment to illness in the study group is medium; adjustment was positively related to self-care habits such as better adherence to pharmacological treatment, physical activity, and not smoking.

Descriptors: psychosocial support systems; HIV infections; HIV-1; treatment adherence and compliance; social adjustment.

Ajuste Psicosocial a la Enfermedad en personas HIV-positivas de la Ciudad de Buenos Aires, Argentina

Resumen

Objetivo. Analizar el proceso de ajuste psicosocial en una muestra de personas que conviven con el Virus de la Inmunodeficiencia Humana de la Ciudad Autónoma de Buenos Aires, Argentina. **Métodos.** Estudio analítico de corte transversal. La muestra estuvo integrada por 144 personas HIV-positivas elegidos mediante muestreo aleatorio simple. Se empleó para la medición del proceso de Ajuste Psicosocial el cuestionario PAIS-SR, el cual está integrado por 46 ítems organizados en 7 dominios, cuyo puntaje final oscila entre 0 y 100, interpretándose de modo que, a mayor puntaje es peor el proceso de ajuste psicosocial. **Resultados.** Los encuestados fueron en su mayoría sexo masculino (82.63%), solteros (61.80%), con estudios universitarios (50%), sin hijos (74.30%) y con trabajo estable (88.19%); la media de edad de los participantes fue de 43.8 años. La mediana del puntaje global fue de 51.4 (RIQ:12). Los dominios con peor precepción de ajuste psicosocial fueron: Orientación al cuidado de la salud (Me: 56, RIQ: 20), Relación con la Familia Extendida (Me: 55, RIQ: 20) y Relaciones sexuales (Me: 54, RIQ: 14), mientras que los que tuvieron mejor percepción de ajuste fueron: Ambiente familiar (Me: 48, RIQ: 8), Distrés psicológico (Me: 48, RIQ: 17), Ambiente social (Me: 50, RIQ: 18) y Ambiente Laboral (Me: 50, RIQ: 12). Se encontró que los pacientes con un mal proceso de ajuste psicosocial presentaban una baja adherencia al tratamiento y más frecuencia de tabaquismo y sedentarismo ($p<0.001$), mientras que un mejor proceso de ajuste psicosocial se asoció a ser de sexo masculino, mayor edad y tener empleo estable ($p<0.001$). **Conclusión.** El proceso de ajuste psicosocial a la enfermedad en el grupo de estudio es medio; el ajuste se relacionó en forma positiva con hábitos de autocuidado como una mejor adherencia al tratamiento farmacológico, realización de actividad física y no fumar.

Descriptores: sistemas de apoyo psicosocial; Infecciones por VIH; VIH-1; cumplimiento y adherencia al tratamiento; Ajuste social.

Ajuste Psicossocial à doença nas pessoas HIV-positivas da Cidade de Buenos Aires, Argentina

Resumo

Objetivo. Analisar o processo de ajuste psicossocial numa amostra de pessoas que convivem com o Vírus da Imunodeficiência Humana da Cidade Autônoma de Buenos Aires, Argentina. **Métodos.** Estudo analítico de corte transversal. A amostra esteve integrada por 144 pessoas HIV-positivas elegidos mediante amostragem aleatório simples. Se empregou para a medição do processo de Ajuste Psicossocial o questionário PAIS-SR, o qual está integrado por 46 itens organizados em 7 domínios, cuja pontuação final oscila entre 0 e 100, interpretando-se de modo que, a maior pontuação é pior que o processo de ajuste psicossocial. **Resultados.** Os entrevistados foram na sua maioria do sexo masculino (82.63%), solteiros (61.80%), com estudos universitários (50%), sem filhos (74.30%) e com trabalho estável (88.19%); a média de idade dos participantes foi de 43 anos. A média da pontuação global foi de 51.4 (RIQ:12). Os domínios com pior percepção de ajuste psicossocial foram: Orientação ao cuidado da saúde (Me: 56, RIQ: 20), Relação com a Família Estendida (Me: 55, RIQ: 20) e Relações sexuais (Me: 54, RIQ: 14), enquanto que os que tiveram melhor percepção de ajuste foram: Ambiente familiar (Me: 48, RIQ: 8), Distresse psicológico (Me: 48, RIQ: 17), Ambiente social (Me: 50, RIQ: 18) e Ambiente Laboral (Me: 50, RIQ: 12). Se encontrou que os pacientes com um mal processo de ajuste psicossocial apresentavam uma baixa aderência ao tratamento e mais frequência de tabaquismo e sedentarismo ($p<0.001$), enquanto um melhor processo de ajuste social se associou a ser de sexo masculino, maior idade e posse de emprego se relacionaram com um melhor processo de ajuste psicossocial ($p<0.001$). **Conclusão.** O processo de ajuste psicossocial à doença no grupo de estudo é médio; o ajuste se relacionou em forma positiva com hábitos de autocuidado como uma melhor aderência ao tratamento farmacológico, realização de atividade física e não fumar.

Descritores: sistemas de apoio psicossocial; infections à VIH; HIV-1; cooperação e adesão ao tratamento; ajustamento social.

Introduction

Today, Human Immunodeficiency Virus (HIV) continues to be a major global public health concern. There are approximately 38 million people currently living with HIV and 33 million people have died due to HIV-related causes.(1) In Argentina, according to the Ministry of Health, 139,000 people living with HIV, of which 83% know their condition. In 2018, 5,800 people were diagnosed with the infection (36.5% of them in advanced stages), the perinatal transmission rate was 4.6%, and 1,458 people died from causes related to Acquired Immunodeficiency Syndrome (AIDS).(2)

The progression of HIV infection leads to a deterioration of immune response, leading to AIDS.(3) Conditions such as social marginalization and discrimination generate high levels of stress, causing the appearance of various psychophysical pathologies, which leads to considering HIV infection as a psychosocial problem,(4-6) leading to a new variable of analysis and interest: the Psychosocial Adjustment Process. This process includes aspects such as health care orientation, vocational environment, domestic environment, sexual relationship, extended family relationship, social environment, and psychological distress. All of them have an impact on the health maintenance of HIV-positive patients, directly influence on the implementation of self-care behaviors or in its deficit (when support is lacking), low adherence to treatment, and other crucial aspects for the disease management.(7-9) In this regard, authors such as Villacres-García *et al*,(10) mention that the lack of economic resources to comply with antiretroviral therapy and medical check-ups, low self-esteem, physical abuse, and discrimination, entail low adherence to treatment and, consequently, a decrease in the CD4 count and higher viral load. Therefore, the measurement and approach to psychosocial well-being are considered of great importance in the comprehensive approach of the subject, separating the biologists and reductionist conception of the treatment of disease, only based on the improvement of clinical laboratory parameters to advance on the inclusion of psychosocial aspects such as the promotion of healthy family and work relationships, the promotion of self-esteem and the reduction of distress and anguish.

For nurses who are part of the HIV multidisciplinary teams in HIV specialized centers and primary care areas, and based on the above, the need for a holistic and comprehensive approach to people living with HIV is evident. This approach requires not only knowledge about the virus and its associated disease, but also the development of skills that allow them to provide optimal care. The inclusion of the family as an essential part of care, the recognition of education as a tool for the reduction of discrimination and a potential strategy for social inclusion, the promotion of self-care including treatment adherence, inter alia, are some of the relevant aspects that are often neglected in the caring role. According to Evans & Dukes,(11) it is necessary to delimit and strengthen the roles, influences, and responsibilities of nurses in the approach to the HIV patient, which includes the incorporation of more professionals in community areas, hospitals, educational and research services, as well as the participation and in the execution of activities of prevention, testing, disclosure, promotion of treatment adherence, family education, and approach of people with HIV/AIDS-associated disorders during hospitalization. The objective of this study was to analyze the process of psychosocial adjustment to illness in a sample of people living with the Human Immunodeficiency Virus from Buenos Aires, Argentina.

Methods

Study design. A cross-sectional study was conducted in the first half of 2020.

Population and sample. The population consisted of HIV-positive patients from Buenos Aires, and the sample was selected from private clinics in the city. The sample calculation sought to ensure a confidence level of 95%, the statistical power of 80% and, a proportion of 20%.(12,13) The sampling technique was simple random sampling. The sample was selected using the medical appointment schedule, which were loaded into an Excel spreadsheet and then the patients were randomized and selected using the Work in Epidemiology tool (WinEpi©2006). Twelve patients were surveyed per week for a period of 3 months (13 weeks). The sample to recruit was 121 people and anticipating a 20% loss rate (incomplete or poorly filled out instruments), 153 individuals were recruited. The final sample consisted of 144 observations (9 incomplete records were eliminated).

Inclusion and exclusion criteria. Individuals who had been diagnosed with Human Immunodeficiency Virus Infection were included within these criteria, aged between 18 and 60 years, with no altered mental status (diagnosis of dementia or cognitive impairment), with more than 6 months of diagnosis and more than 3 months in antiretroviral treatment, and who did not have any degree of disability (visual, auditory, motor or mental), and were excluded people with hormone replacement therapy, those who have not completed the questionnaire, have a history of hospitalization in the last 30 days and pregnant women.

Instruments. For data collection, the Psychosocial Adjustment to Illness Scale – Self Report (PAIS-SR) was implemented in its Spanish validated version (Cronbach's alpha 0.93).(14-16) The instrument was licensed for use by Clinical Psychometric Research, Inc.

This instrument is made up of 46 items aimed to assess both the psychological and social adjustment of medical patients in various clinically important/ relevant domains applicable to a wide spectrum of chronic disorders.(14) The construct measures its items in 7 specific domains: health care orientation (items 1-8), vocational environment (items 9-14), domestic environment (items 15-22), sexual relationships (items 23-28), extended family relationships (items 29-33), social environment (items 34-39), and psychological distress (items 40-46).

Regarding the interpretation of the PAIS-SR scores, the global score indicates the general psychosocial adjustment to illness of the patient, while the domains and the items scores can help with the assessment of specific areas of psychosocial adjustment. An overall score above 62 points indicates that the patient has difficulty adapting to the disease. Higher scores indicate a lower level of adjustment. Each item of PAIS-SR is rated on a 4-point scale that is scored in an increasing sense (odd-numbered questions) or decreasing (even-numbered questions) to which numerical values ranging from 0 to 3 are assigned, and which are then grouped into the 7 domains mentioned as indicated in the PAIS-SR administration, scoring, and analysis procedure manual.

The score in the health care orientation domain ranges between 0 and 24, vocational environment between 0 and 18 points, domestic environment between 0 and 24 points, sexual relationship between 0 and 18 points, extended family relationships between 0 and 15 points, social environment between 0 and 18 points, and psychological distress between 0 and 21 points. These raw scores are then converted to T-scores ranging from 0 to 100.

The above information was complemented with a battery of questions that sought to investigate the sociodemographic profile of the respondent, self-care habits (smoking and physical activity), and the 4-item Morisky Medication Adherence Scale to determine the adherence to pharmacological treatment.(17) The latter is made up of 4 dichotomous response items (yes or no) that assess the barriers to correct therapeutic adherence: Do you ever forget to take your medications? At times, are you not careful about taking your medicine? When you feel better, do you sometimes stop taking your medicine?, and Sometimes, if you feel worse when you take the medicine, do you stop taking it?. People who answer No/No/No/No are considered high adherents.

Data collection and analysis. The patients were invited to engage in the study during the medical visit and were provided with information about the study; subsequently, their consent to participate in the research was requested. Those who consented were given the data collection instrument to fill it out after the medical visit in the waiting room and return it when finished. The collected information was tabulated in a database in the Excel program and analyzed using the Infostat v/L program. Score calculations corresponding to the domains were performed as previously mentioned. For the descriptive analysis of the numerical variables, the mean, standard deviation, and range were calculated, and for the categorical variables, the absolute and relative frequencies were calculated. The non-parametric Mann-Whitney, Kruskal-Wallis, and Spearman Correlation tests were used for the statistical analysis. The statistical significance value was set at $p<0.05$.

Ethical considerations. The study was approved by the Ethics Committee for Scientific and Technological Research of the Universidad Abierta Interamericana (UAI) under the number 0-1038. The participation of the subjects was voluntary, and the signature of the Informed Consent was requested. The personal data of the participants was always protected, ensuring compliance with the Personal Data Protection Law.

Results

Sample characterization

144 subjects take part, mostly male (82.63%), single (61.80%), with university studies (50%), without children (74.30%) and with a steady job (88.19%); of which, 58.33% represented self-employed workers, 26.38% with a dependent employee, and 3.47% with unregistered employment. The mean age was 43.8 years (SD: 11) with a range between 24 and 64 years (Table 1).

Table 1. Sociodemographic characteristics

Variable		Frequency	Percent (%)
Gender			
	Male	119	82.63
	Female	25	17.36
Civil status			
	Single	89	61.80
	Domestic partnership	29	20.13
	Married	19	13.19
	Divorced	6	4.16
	Widowed	1	0.69
Level of education			
	Primary school	5	3.47
	Secondary school	32	22.22
	Tertiary level	35	24.30
	University degree	72	50.00
Employment status			
	Employed	127	88.19
	Unemployed	17	11.80
Children			
	Yes	37	25.69
	No	107	74.30

It was found that respondents had a time since HIV infection diagnosis of 9.9 years (SD: 8) with a range between 1 and 31 years. 31.94% presented HIV/AIDS-related complications, being the most common pneumonia (17.35%) and Herpes infection (8.33%). 38.88% were smokers and 43.75% sedentary. The treatment adherence was considered satisfactory (patients compliant with the pharmacological regimen) in 49.30%.

Psychosocial Adjustment Process

The analysis of Psychosocial Adjustment Process domains showed that Extended family relationship unfolded the higher score (worst perception) with a median of 55.00 (Interquartile range: 20), followed by Health care orientation with a median of 56.00 (IQR: 20), while the lowest score (best perceived) was found in Vocational environment domain with a median of 50.00 (IQR: 12) (Table 2).

Table 2. Descriptive statistics of Psychosocial Adjustment to Illness domains

Domain	Mean	Standard deviation	Median	Q1	Q3
Extended Family Relationship	55.98	9.15	55.00	45.00	65.00
Health Care Orientation	55.83	13.95	56.00	45.00	65.00
Sexual Relationship	52.56	8.82	54.00	45.00	59.00
Social Environment	49.99	8.83	50.00	40.00	58.00
Domestic Environment	49.37	9.91	48.00	45.00	53.00
Psychological Distress	49.29	9.16	48.00	40.00	57.00
Vocational Environment	49.03	8.18	50.00	40.00	52.00
Totals	51.72	7.32	51.43	45.71	57.71

In the Health care orientation domain, the item with the lowest score was "Patient expectancies - treatment" with a mean of 0.37, which refers to the different ideas about the treatment or what the patient expects from medical treatment, while "Health care – present disorder" presented the highest score with a mean of 1.33, which shows dissatisfaction or discomfort with the special attention or care that is demanded as part of the treatment.

In the Vocational Environment domain, it was found that the item with the lowest score was "Interpersonal conflicts" with a mean of 0.21, while "Vocational goals" presented the highest score with a mean of 0.65; the above refers to the fact that respondents have largely had to make changes in their work or education-related goals because of their illness although they do not experience relevant conflicts in their workplaces. In the Domestic environment domain, it was found that the item with the lowest score was "Family Communication" with a mean of 0.35, which points out that there has been no marked decrease in communication between the respondent and his/her family members, while "Quality of relations - principal cohabitant" had the highest score with a mean of 0.82.

Regarding the Sexual Relationship domain, the item with the lowest score was "Interpersonal conflict – sexual" with a mean of 0.46 which refers to the constant discussions with the partner about the disease and its impact on sexual relationships, while "Frequency of sexual activity" obtained the highest score with a mean of 1.04 showing the decrease in the frequency of sexual intercourse after diagnosis. In the Extended Family Relationship domain, the lowest scoring item was "Dependency – social" with a mean of 0.29, while "Interest in interacting [with extended family]" was the highest scoring item with a mean of 0.85, showing a marked decrease in interest in interaction with family post-diagnosis.

In the Social Environment domain, the items with the highest mean score were "Family leisure interest" and "Social leisure interest" with a mean of 0.23 in both cases which refer to interest in performing leisure activities with the family or alone from the moment diagnosis was carried out or prior to the time before diagnosis. On the other hand, "Individual leisure activity" obtained the highest score in this domain with a mean of 0.92, and which queries about their current participation in the daily leisure activities individuals performed before diagnosis.

Finally, regarding Psychological Distress, the best-perceived item was "Guilt" with a mean of 0.60 and which refers to the feeling of guilt for things that happen or the feeling of having failed someone, while the item "Anxiety", which exposes the feeling of being tense, fearful, nervous, or anxious, was the highest scored item with a mean of 1.05.

After calculating the raw scores (R-Scores) and converting them to their equivalent T-Score (index from 0 to 100), the corresponding inferential analysis was performed. Regarding age, a negative correlation was found between age and the domains Health care orientation (rs: -0.24, p: <0.01), Vocational environment (rs: -0.16, p: 0. 05), Domestic environment (rs: -0.19, p: 0.02), Extended family relationship (rs: -0.24, p: <0.01), Social environment (rs: -0.23, p: <0.01) and Psychological distress (rs: -0.21, p: 0.01). According to the aforementioned data, it can be firstly inferred that the older the age, the better the psychosocial adjustment process and, secondly, that the young population presents greater psychosocial maladjustment to illness.

Regarding sex, the male population presented a better process of adaptation to the vocational environment (p: 0.05) and Extended family relationship (p: 0.01).

Regarding employment status, it was found that, in those with steady employment, regardless of contract modality (self-employed, dependent, or unregistered worker), the means of psychosocial adjustment process domains were lower, which point out to a better adaptation process (p: <0.01).

When analyzing the relationship between adherence to treatment and the psychosocial adjustment to illness, we found that patients with poor adherence to treatment had the worst adjustment process (see Table 3). These findings were statistically significant, although a cause-effect relationship cannot be established.

Also, was found that the psychosocial adjustment process showed a statistical relationship between physical activity and Sexual relationship domain (p: 0.01) and Extended family relationship (p:<0.01), while smoking habit displayed a statistical relationship with all psychosocial adjustment domains (p: <0.05). In all cases, higher medians were found in those with sedentary as well as smoking habits.

Table 3. Treatment adherence and Psychosocial Adjustment to Illness domains

PAIS domains	Treatment adherence*		
	Good	Poor	*p*-Value†
Health Care Orientation	50.00 (20.00)	60.00 (20.00)	<0.01
Vocational Environment	45.00 (10.00)	52.00 (12.00)	<0.01
Domestic Environment	45.00 (13.00)	48.00 (15.00)	<0.01
Sexual Relationship	54.00 (14.00)	54.00 (9.00)	0.70
Extended Family Relationship	50.00 (15.00)	60.00 (15.00)	<0.01
Social Environment	40.00 (15.00)	56.00 (14.00)	<0.01
Psychological Distress	47.00 (15.00)	55.00 (14.00)	0.01
Totals	45.71 (6.00)	54.14 (8.14)	<0.01

*Median and Interquartile Range. †Wilcoxon/Mann-Whitney U Test.

Discussion

Since the middle of the last century, there has been an exponential increasing interest in the concept of the psychosocial adjustment process in medicine areas inter alia, such as psychiatry, nephrology, oncology, and cardiology. With the advancement of medical sciences, the survival of patients with chronic diseases including HIV infection, has increased, which has demanded the development of coping strategies, maintenance of psychological integrity and, social support, all of which encompass the so-called psychosocial adjustment process.(14,18,19)

For nurses, it is imperative to analyze the processes of coping and adjustment to illness, since imbalances in this area can considerably affect self-care.(18) In this regard, theorists such as Callista Roy and Dorotea Orem have addressed the conceptions of these two aspects, and in an interrelationship between these, several studies have identified a relationship between how the diagnosis is faced and how self-care strategies are implemented.(20,21)

The present study analyzed the process of psychosocial adjustment to illness in people with HIV infection and found an adequate adjustment to the demands of the disease and the relation between that process and self-care, including adherence to pharmacological treatment.

It was found that the patient's relationship with the health care system, as well as the differences between their expectations and the reality of the care process, influenced pharmacological adherence; these findings were consistent with similar studies.(13) Health care professionals should look after patients` health, and in this aspect, the transmission of timely and adequate information along with the maintenance of a cordial relationship based upon mutual trust is considered relevant, since these precepts influence the level of compliance with medical indications.

Concerning employment status, the present study identified an association between having a steady job and adequate psychosocial adjustment in six of the seven domains investigated. Previous studies have identified that having a steady job allows establishing social support, improving self-esteem and the perception of worth, while economic security contributes to survival and a better quality of life, which explains our findings.(22)

Extended family relationship was the domain with the most alterations in the surveyed population, and this was shown to be related to low adherence to pharmacological treatment. These findings are similar to studies in adult and adolescent populations, which described that family cohesion and support, strengthen the ability to cope with external stressors, determine the emotional and behavioral response, and promote treatment compliance as well as self-care.(23,24)

Depression, stress, anxiety, irritability, low self-esteem, and resilience, as well as ineffective coping behaviors such as cognitive avoidance and emotional discharge, are predictors of low adherence to treatment.(25,26) In the present study, the items comprising the psychological distress domain were related to the discontinuation of antiretroviral therapy. It has been suggested that resilience, defined as the ability to transform adversity into opportunities for growth and adaptation, may be important for people with HIV who are susceptible to anxiety and depression, as well as to prevent risk behaviors such as alcohol abuse, smoking, drug addiction, and treatment discontinuity.(27)

The present study constitutes a relevant antecedent due to the lack of national and international bibliography in this area, and could propose new axes of management, treatment, and re-direction of public policy in terms of care for those living with HIV, given the need for a comprehensive approach to this problem and avoiding the biological approach and the pharmacological commercialization of disease. This implies the consideration that people do not get sick alone, but in constant interaction with society, considering aspects such as social relationship (family, friends, work, and education), healthcare orientation, and discrimination as variables of interest for the prevention of the disease; however, to provide appropriate care, interventions are required to improve nurses' attitudes towards people with HIV/AIDS, due to the influence of increasing involvement in training programs and greater efficiency in the provision of quality care.(28)

From nursing, the design of holistic approaching programs, health education, community awareness and the design of new care protocols have proven to bear relevant benefits in other countries in the prevention of complications and higher adherence to self-care indications proposed by health professionals.(29) However, in our country it is necessary to give greater participation to nursing professionals to achieve the task of ensuring the health of this population. Likewise, more studies are required to identify and address the elements that could be influencing adherence to treatment as the basis of self-care for patients with chronic diseases such as HIV infection, in addition to increasing the participation of nursing professionals in specialized primary care programs for this population.

Conclusion. A high level of discomfort was found with respect to the care required for the treatment of HIV infection (medication, diet, physical activity, and other self-care behaviors), as evidenced by the high mean score on the item "Health care – present disorder" of the Health care orientation domain (mean 1.33), while a lack of conflicts or problems with coworkers due to the disease was identified, as evidenced by the score on the item "Interpersonal conflicts" of the Vocational environment domain (mean 0.21). Male presented higher levels of adjustment and adaptation to the demands from Vocational environment and in Extended family relationships after HIV diagnosis. A statistical significance was identified between adherence to treatment and the psychosocial adjustment process, finding that patients with low adherence to treatment showed inadequate adjustment processes, although no cause-effect relationship can be established for this finding.

This study had limitations such as a small sample size and those results apply to people from middle-income chronic diseases specialized care programs. Data collection carried out by a single researcher and rigorous methodological analysis are strengths of this study. More research is required to deepen the analysis of the relationships between other variables that can affect the process of psychosocial adjustment and pharmacological adherence in HIV patients.

References

1. World Health Organization. HIV/AIDS: Key Facts [Internet]; 2020 (cited 14 Feb 2022). Available from: https://www.who.int/es/news-room/fact-sheets/detail/hiv-aids.
2. Argentina. Ministry Of Health. Boletín Oficial Sobre VIH, SIDA y ITS N°36; 2019 (cited 14 Feb 2022). Available from: Disponible en: http://www.msal.gob.ar/images/stories/bes/graficos/0000001754cnt-boletin-epidemiologico-2019_vih-sida-its.pdf.
3. Boza CR. Patogénesis del VIH/SIDA. Rev. Clin. Esc. Med. 2017; 7(5):28-46.
4. Plascencia de la Torre JC, Chan Gamboa EC, Salcedo Alfaro JM. Predictive Psychosocial Variables of Non-Adherence to Antiretrovirals in People with HIV-AIDS. CES Psicol. 2019; 12(3), 67-79.
5. Saucedo P, Huerta B, Alcántar Z, Ruiz R, Jiménez A, Avila C. Stigmatization of people with HIV-AIDS in primary care as a barrier adherence to the treatment. Rev. Salud Publica Nutr. 2018;17(3):26-33.
6. Ocampo S, Vargas M. Psychosocial impact on patients with AIDS virus who attend the hospital de Encarnacion, Paraguay 2016. Rev. ANACEM. 2018; 12(1):7-12.
7. Oskouie F, Kashefi F, Rafii F, Gouya MM, Vahid-Dastjerdi M.Facilitating factors of self-care among HIV-positive young women in Iran: a qualitative study. Int. J. Adolescent. Med. Health. 2018; 20170172.
8. Aguilar Alencar B, Henrique Parenti A, Carvalho Lopes C, Tomé Ramos F, Itsuko S. Aspects that influence the self-care of patients living with human immunodeficiency virus. Rev. Latino-Am. Enfermagem. 2019; 27:e3112.
9. Handayani Y, Susanti H. The self-esteem of gay men with HIV/AIDS in social adaptation. Enferm. Clin. 2019; 29(S2):874-8.
10. Villacres-García F, Ruiz del Valle D, Ochoa-Loor J. Factors influencing antiretroviral treatment in patients with HIV/AIDS “Martin Icaza” hospital. Dom. Cien. 2017; 3(2):849-65.
11. Evans DT, Dukes M. Current approaches to HIV prevention, treatment and care. Nurs. Stand. 2018; 43(8):45-52.
12. Rendón-Macías ME, Villasís-Keever MA. The research protocol V: The calculation of sample size. Rev. Alerg. Méx. 2017; 64(2):220-227.
13. Canova-Barrios C. Relación entre la Calidad de vida relacionada con la salud, carga viral, conteo de células CD4 y adherencia al tratamiento en pacientes VIH-positivos: Un estudio transversal en pacientes de una Institución Privada de la Ciudad de Buenos Aires, Argentina. Buenos Aires: Universidad Abierta Interamericana, 2020.
14. Derogatis L. The psychosocial adjustment to illness scale (PAIS). J. Psychosom. Res. 1985; 1(30):77-91.
15. Ambrosio L, Navarta-Sánchez MV, Portillo MC, Martin-Lanas R, Recio M, Riverol M. Psychosocial Adjustment to Illness Scale in family caregivers of patients with Parkinson’s Disease: Spanish validation study. Health Soc. Care Community. 2021; 29(4):1030-1040.
16. Crespo Hervás MD, Ferre Navarrete F. Versión española del PAIS-SR un instrumento de medida para la adaptación psicosocial a la enfermedad física. Psiquis. 1992; 13(6-7):38-45.
17. Pagès-Puigdemont N, Valverde-Merino MI. Methods to assess medication adherence. Ars. Pharm. 2018; 59(3):163-72.
18. Farber EW, Mirsalimi H, Williams KA, McDaniel JS. Meaning of Illness and Psychological Adjustment to HIV/AIDS. Psychosom. 2003; 44(6):485–91.

19. Bhochhibhoya A, Harrison S, Yonce S, Friedman DB, Ghimire PS, Li X. A systematic review of psychosocial interventions for older adults living with HIV. AIDS Care. 2021; 33(8):971-82.
20. Chávez López JL, Franco Corona BE, López López G, Ocampo López EJ, Rangel Perez SB, Tovar Yepez IA, Zamarripa Jasso EL. Capacidad de autocuidado y estrategias de afrontamiento en la persona con enfermedad crónica. Jóvenes Cienc. 2019; 5(1):1-7.
21. Pérez-Giraldo B, Veloza-Gómez MM, Ortiz-Pinilla JE, Pérez-Giraldo B, Veloza-Gómez MM, Ortiz-Pinilla JE. Coping and adaptation and their relationship to the spiritual perspective in patients with HIV/AIDS. Invest. Educ Enferm. 2012; 30(3):330-8.
22. Arévalo-Baquero AM, Rubiano-Mesa YL. The meaning of work for people living with HIV. Rev. Fac. Nac. Salud Pública. 2018;36(3):90-100.
23. Li L, Ji G, Liang LJ, Ding Y, Tian J, Xiao Y. A multilevel intervention for HIV-affected families in China: Together for Empowerment Activities (TEA). So. Sci. Med. 2011; 73(8):1214-21.
24. Damulira C, Mukasa MN, Byansi W, Nabunya P, Kivumbi A, Namatovi P, et al. Examining the relationship of social support and family cohesion on ART adherence among HIV-positive adolescents in southern Uganda: baseline findings. Vulnerable Child. Youth. Stud. 2019; 14(2):181-90.
25. Fletcher FE, Sherwood NR, Rice WS, Yigit I, Ross SN, Wilson TE, et al. Resilience and HIV Treatment Outcomes Among Women Living with HIV in the United States: A Mixed-Methods Analysis. AIDS Patient Care STDS. 2020; 34(8):356-66.
26. Ahumada M, Escalante E, Santiago I. Preliminary study of relations between coping strategies, social support and adherence to treatment in people living with HIV/AIDS. Subjetividad y procesos cognitivos. 2011; 15(1):55-70.
27. Turan B, Smith W, Cohen MH, Wilson TE, Adimora AA, Merenstein D, et al. Mechanisms for the Negative Effects of Internalized HIV-Related Stigma on Antiretroviral Therapy Adherence in Women: The Mediating Roles of Social Isolation and Depression. J. Acquir. Immune Defic. Syndr. 2016; 72(2):198-205.
28. Conejeros I, Emig H, Ferrer L, Cabieses B, Cianelli R. Knowledge, attitudes and perceptions of nurses and nursing students towards HIV/AIDS. Invest. Educ. Enferm. 2010; 28(3):345-54.
29. Abe M, Turale S, Klunklin A, Supamanee T. Community health nurses' HIV health promotion and education programmes: a qualitative study. Int. Nurs. Rev. 2014; 61(4):515-24.

Original article

Evaluation of Indicators of a Vascular Access Device Program led by Nursing Professionals in a High-complexity University Hospital in Colombia

Olga L Cortés[1,8]
https://orcid.org/0000-0002-9023-7479
Yeris M. Parra[2,8]
https://orcid.org/0000-0001-6027-2102
Daniela A. Torres[3,8]
https://orcid.org/0000-0003-3606-4930
Patricia Monroy[4,8]
https://orcid.org/0000-0002-7140-8607
Jannette C. Malpica[5,8]
https://orcid.org/0000-0001-8550-0730
Elena P. Pérez[6,8]
https://orcid.org/0000-0002-0892-2427
Carolina Mojica[7,8]
https://orcid.org/0000-0001-8874-8221

1 Nurse, Ph.D.
Email: ocortes@lacardio.org.
Correspondence author.
2 Nurse, Masters student.
Email: yparram@lacardio.org
3 Nurse. Email: lacardiodtorresa@lacardio.org
4 Nurse. Email: pmonroy@lacardio.org
5 Nurse. Email: jmalpica@lacardio.org
6 Nurse. Specialist. Email: eperez@lacardio.org
7 Nurse. Email: t-cmojica@lacardio.org
8 Fundación Cardioinfantil Instituto de Cardiología, La Cardio, Bogotá, Colombia.

Conflicts of interest: None

Received: 12 June, 2021.

Approved: March 3, 2022.

How to cite this article: Cortés OL, Para Y, Torres D, Monroy P, Malpica J.C, Pérez E.P, et al. Evaluation of Indicators of a Vascular Access Device Program led by Nursing Professionals in a High-complexity University Hospital in Colombia. Invest. Educ. Enferm. 2022; 40(1):e12.

DOI: https://doi.org/10.17533/udea.iee.v40n1e12.

Evaluation of Indicators of a Vascular Access Device Program led by Nursing Professionals in a High-complexity University Hospital in Colombia

Abstract

Objective. This work sought to evaluate result indicators of the specialized vascular access program led by nursing during the period between 01 January 2018 and 31 December 2019 at Fundación Cardioinfantil -Instituto de Cardiología (Colombia). **Methods.** This was a retrospective descriptive study based on medical records of 1,210

Investigación y Educación en Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

patients who received insertion of vascular access devices by the specialized group of nurses. Result indicators are described. **Results.** Of all the patients who received insertion of a vascular access catheter, 53.1% were women, with mean age of 34.2 years, admitted to critical care services with cardiovascular problems and sepsis (90.2%). Placement of the peripherally inserted central catheter, midline and arterial was echo-guided between 91% and 100%, with a success rate on the first puncture of 66%. The average duration time of the peripherally inserted central catheter was 25.3 days, that of the midline catheter was 8 days, with a reach of 57% until the end of the treatment. The rate observed per catheter-days of overall phlebitis was 2.03, for positive blood culture of the central peripheral insertion device was 1.9 and thrombosis of 0.50; and arterial line thrombosis was 11.7. **Conclusion.** The Vascular Access Device Program led by nursing reported rational use of these elements with structured therapeutic purposes according with the complexity of the patients admitted to hospitalization. Improvement plans must be implemented to increase efficacy in post-admission insertion times, reduce infection rate and thrombosis through effective follow-up and control mechanisms.

Descriptors: vascular access devices; hospitalization; nursing care.

Evaluación de indicadores de un Programa de Dispositivos de Acceso Vascular liderado por profesionales de enfermería en un hospital universitario de alta complejidad en Colombia

Resumen

Objetivo. Evaluar los indicadores de resultado del programa especializado de accesos vasculares liderado por enfermería durante el periodo comprendido entre enero 1ro de 2018 –diciembre 31 de 2019 en la Fundación Cardioinfantil -Instituto de Cardiología en Colombia. **Métodos.** Estudio descriptivo retrospectivo, con base en historias clínicas de 1210 pacientes que recibieron la inserción de dispositivos de acceso vascular por el grupo especializado de enfermeras. Se describen indicadores de resultado. **Resultados.** Del total de pacientes que recibieron la inserción de un catéter vía acceso vascular, el 53.1% fueron mujeres, con edad promedio de 34.2 años, admitidos en servicios de cuidado crítico con problemas cardiovasculares y sepsis (90.2%). La colocación del catéter central de inserción periférica, de línea media y arterial fue eco-guiada entre el 91-100%, con una tasa de éxito a la primera punción del 66%. El tiempo promedio de duración del catéter central de inserción periférica fue de 25.3 días, la del catéter de línea media fue de 8 días, con un alcance del 57% hasta el final del tratamiento. La tasa observada por días-catéter de flebitis global fue de 2.03, para hemocultivo positivo del dispositivo central de inserción periférica fue de 1.9 y trombosis de 0.50; y trombosis de la línea arterial fue de 11.7.

Conclusión. El programa de dispositivos de acceso vascular liderado por enfermería reportó un uso racional de estos elementos con fines terapéuticos estructurados de acuerdo con la complejidad de los pacientes admitidos a hospitalización. Planes de mejora deben ser implementados con el fin de incrementar la eficacia en los tiempos de inserción pos-admisión, reducción de tasa de infección y trombosis mediante mecanismos efectivos de seguimiento y control.

Descriptores: dispositivos de acceso vascular; hospitalización; atención de enfermería.

Avaliação de indicadores de um Programa de Dispositivos de Acesso Vascular liderado por profissionais de enfermagem num hospital universitário de alta complexidade na Colômbia

Resumo

Objetivo. Avaliar os indicadores de resultado do programa especializado de acessos vasculares liderado por enfermagem durante o período compreendido entre o dia 1° de janeiro de 2018 –dezembro 31 de 2019 na Fundação Cardio-infantil -Instituto de Cardiologia em Colômbia. **Métodos.** Estudo descritivo retrospectivo, com base nas histórias clínicas de 1210 pacientes que receberam a inserção de dispositivos de acesso vascular pelo grupo especializado de enfermeiras. Se descrevem indicadores de resultado. **Resultados.** Do total de pacientes que receberam a inserção de um cateter via acesso vascular, 53.1% foram mulheres, com idade média de 34.2 anos, admitidos em serviços de cuidado crítico com problemas cardiovasculares e sepses (90.2%). A colocação do cateter central de inserção periférica, de linha média e arterial foi ecoguiada entre 91-100%, com uma taxa de sucesso à primeira punção de 66%. O tempo médio de duração do cateter central de inserção periférica foi de 25.3 dias, a do cateter de linha média foi de 8 dias, com um alcance de 57% até o final do tratamento. A taxa observada por dias-cateter de flebites global foi de 2.03, para hemocultura positivo do dispositivo central de inserção periférica foi de 1.9 e trombose de 0.50; e trombose da linha arterial foi de 11.7. **Conclusão.** O programa de dispositivos de acesso vascular liderado por enfermagem reportou um uso racional destes elementos com fins terapêuticos estruturados de acordo com a complexidade dos pacientes admitidos a hospitalização. Planos de melhora devem ser implementados com o fim de incrementar a eficácia nos tempos de inserção pós-admissão, redução de taxa de infecção e trombose mediante mecanismos efetivos de seguimento e controle.

Descritores: dispositivos de acceso vascular; hospitalização; cuidados de enfermagem.

Introduction

Globally, the focus of specialized hospital vascular access programs seeks to standardize institutional processes and procedures for the selection, insertion, and care of vascular access devices (VAD) in patients requiring such. The programs must make sure optimal vascular access, of high durability with minimal adverse events that affect patient safety.(1) Surveillance of safety indicators is based on the evidence of recommendations reported in Clinical Practice Guidelines globally.(2) These programs are led generally by interdisciplinary teams properly trained not only in comprehending the whole process and evaluation of the indicators, but also in los insertion procedures and proper location of these devices.(3)

A VAD specialized team is made up of a group of healthcare professionals with advanced knowledge based on Clinical Practice Guidelines conjugated with skills in the evaluation, insertion, care, and management of VAD, like nurses, physicians, therapists, attending physicians.(4) The VAD passage allows efficient drug delivery and through a much longer lasting route, ensuring high quality of life, better patient experience, and lower risks associated with the treatment. High levels of knowledge and trust have also been constructed based on experience and procedural competence, which suggests positive results in patients.(4)

The VAD include a variety of catheters used for safe and efficient administration of treatments to the circulatory system. A catheter may be designated by the type of vessel it occupies (peripheral venous, central venous, or arterial); its useful life (temporary or short-term, permanent or long-term); its insertion site (subclavian central catheter, femoral, internal jugular, umbilical, peripheral and peripherally inserted [PICC]); by its path from the skin to the vessel (tunneled or not tunneled); its physical length (long, medium, or short), or some special characteristic of the catheter (presence or absence of a cuff, impregnation with heparin, antibiotics or antiseptics and the number of lumens).(4) Vascular access catheters are indicated or prescribed in general for various reasons: hemodynamic monitoring, kidney replacement therapy, nutritional support, drug infusion, administration of infusions, administration of blood products and/or taking of blood samples.(4) Their use is considered, in turn, a determinant of quality of life for patients who require prolonged care, whether in hospitalization or in out-patient care and suffer other types of complications, like chronic pain.(4)

Reduction in the number and quality of punctures reduces pain and stress of each procedure, making a specific procedure more friendly, thus, contributing to the quality of life of patients in chronic state.(1-4) Likewise, reduction in time of use is an indicator associated with lower presence of infections in blood associated with the catheter.

Insertion of each catheter requires safety protocols and must be used by individuals trained in their management and care.(1,5) Success in placing a catheter and its operation will depend on an adequate evaluation of the insertion site, on the device selection, and placement of the metallic guide through the skin until reaching the blood vessel, to start a treatment.(5) However, use of assessment tools of the insertion site, such as the ultrasound, as well as implementation of rules in clinical prediction, have facilitated improving the success result in the first insertion.(6) Failure during the first insertion leads to complications, like skin lesions that limit a new access in the same place, pain, and uncertainty of patients and relatives. Multiple punctures lead to increased risk of infection.(7)

Various risks exist related with the insertion of vascular access devices and continuous care. These risks may be related with the operator or the patient. Post-insertion complications include venous thrombosis related with the catheter, which can require further medical intervention and prolong the hospital stay. Particularly at risk for post-insertion complication are people with cancer or who are critically ill. Risk of infusion-related phlebitis or thrombophlebitis with peripheral intravenous catheters (PIVC) is observed when the cannulated vein becomes painful with other signs, like erythema in the insertion site. Catheter-associated infections are a significant hospital burden in terms of health costs and are associated with all the vascular access devices, especially with central venous catheters.(1,2)

Bearing in mind that 90% of the patients admitted to the FCI-IC are in critical state and require at least one venous access as indication for their treatment, it became necessary to plan clear guidelines to manage vascular access based on Clinical Practice Guidelines.(1-7) Training of professionals for the Venous Access program includes knowledge in selecting intravascular devices, correct insertion by using diagnostic means, and evaluation of the evolution of the procedures through indicators.(3,4) Similarly, the responsibilities of its members were defined. Prescription of the device is made by the physician; the evaluation of the insertion site and the insertion may be conducted by a physician or the professional nurse. Direct care of the devices is carried out by nurses in each service according with the insertion prescription. Monitoring of complications, like infections is performed by the institutional quality and infections team; and patients and their relatives are involved in self-care and responsibility whether in hospitalization or when the patient is discharged with the catheter for outpatient care.(8)

The aim of this study was to report the outcomes of the result indicators of the specialized vascular access program led by nursing to structure improvement plans at Fundación Cardioinfantil - Instituto de Cardiología.

Methods

An observational retrospective longitudinal study was conducted, whose universe included adult patients and children admitted to hospitalization at Fundación Cardioinfantil in Bogotá (Colombia). It included all the clinical records of patients who required inter-consultation by the group of institutional vascular access professional nurses for the evaluation and insertion of different types of catheters, hospitalized between 01 January 2018 and 31 December 2019. The services included were adult and pediatric hospitalization; pediatric and neonate intensive care units [pediatric cardiovascular care unit, general pediatric unit, and the neonate intensive care unit]; specialized intensive care units [transplant unit and hemodynamics unit, ambulatory care unit, gastroenterology]; and the adult and children emergency service. The study excluded services where professionals (physicians-nurses] insert catheters independently from the vascular access group: surgical adult intensive care units, adult coronary care unit, surgery, radiology (children-adults), and hemodynamics.

This study was approved by the Institutional Ethics Committee, given the importance of data protection. The information was obtained from the clinical records consigned in the database of the vascular access program. This information included the demographic variables of age and gender, and clinical variables related with the description of the type of hospitalization service, indication of the catheter, insertion site, characteristics of the catheters, total number of ultrasound-guided catheters, average time in days to the event between admission and insertion, opportunity time measured in days between the evaluation after the inter-consultation and catheter insertion, average time in days of the catheter's duration, average time of opportunity and related quality indicators (positive blood culture catheter, phlebitis, thrombosis, infiltration).

The analysis was descriptive type. The continuous variables included in the study were reported through means (standard deviation) or medians (inter-quartile range) according with the presence of marked asymmetry. The discrete variables were described in terms of counts (percentages). The types of catheters observed were peripherally inserted central catheter (PICC), peripheral venous catheter (PVC), Midline catheter (MLC) and arterial line catheter (ALC). The work included the rates obtained from events related with the catheter (95% confidence interval), and catheter-related infection rate (CIR) (number of events/catheter-days x1000).

Results

Description of demographic aspects. The study evaluated 1,210 patients who were requested inter-consultation for evaluation and administration of a catheter by the nursing vascular access group during the period observed. This sample did not observe patients with more than one catheter inserted during the same hospitalization period. Of all the catheters managed in their care by professional nurses, 41.1% were PICC, followed by CPV (37.9%), MLC (15.5%), and ALC (5.6%). Among the demographic characteristics of the patients who received each of these procedures, it was noted that women received the highest number of catheters in their care (53.1%), with a mean age for insertion of an MLC or a PICC of 49.5 and 38.6 years, respectively. The ALC was installed with greater frequency in children. The services requiring inter-consultation with greater frequency were hospitalization (46.7%) and the intensive care units, ICU, (44.2%), where the PICC and the MLC were the catheters of greatest frequency (Table 1).

Description of aspects related with the health condition. Patients in critical state with infectious processes required central catheter insertion (MLC with 42.3% and PICC with 32%), followed by patients admitted with diagnoses of cardiovascular origin (PICC with 17.3%; MLC with 14.4%) and cancer (PICC with 29.2%, MLC with 12.3%), with used of support for hemodynamic monitoring with ALC LA in these patients. Catheters were indicated principally primarily for the administration of antibiotic therapy, application of venous liquids and taking of laboratory samples. The rest of the indications, differentiated by type of catheter, can be observed in Table 1.

Aspects of the procedure and use of the catheter

The vascular access group identified catheter access difficulties in 737 cases (65.8%) caused by the presence of edema, skin lesions, and ecchymosis caused by venipunctures that had been performed by caregivers different from the institutional vascular access group. Two in every three catheters were inserted on the first puncture, although guided between 54.5% in PVC and 100% in MLC. The insertion site of greater prevalence for PICC and MLC was the basilic vein with 75.2% and 73.3%, respectively, the insertion site chosen most frequently to insert the ALC was the brachial artery (36.8%), and the cephalic vein was for insertion of PVC (35.7%), overall with greater tendency to being installed in the right hemibody.

Table 1. General data related with insertion of the catheter

Variable	Total *n* = 1,210	PICC *n* = 496	MLC *n* = 187	PVC *n* = 459	ALC *n* = 68
Description of demographic data					
Age, mean (RIC)	28.4 (0.11-81)	38.6 (29.1)	49.5 (31.4)	13.8 (25.3)	6.4 (5.3)
Age category; *n* (%)					
<1 year	123 (10.1)	28 (6.4)	6 (3.3)	83 (30.3)	6 (15.0)
2- 18	335 (27.7)	147 (33.7)	44 (24.2)	110 (40.1)	34 (85.0)
19-65	240 (20.1)	144 (33.0)	49 (26.9)	47(17.2)	-
>65	234 (19.3)	117 (26.8)	83 (45.6)	34 (12.2)	
Sex					
Female	642 (53.0)	249 (50.2)	117 (62.6)	241 (52.5)	35 (51.5)
Male	568 (47.0)	247 (49.8)	70 (37.4)	218 (47.5)	33 (48.5)
Service					
Emergency	95 (7.8)	35 (7.1)	23 (12.3)	37 (8.1)	-
Hospitalization	565 (46.6)	256 (51.6)	116 (62.0)	192 (41.8)	1 (1.51)
ICUs	535 (44.2)	202 (40.7)	48 (25.7)	218 (47.5)	67 (98.5)
Special units	15 (1.2)	3(0.6)	-	12.0 (2.6)	-
Diagnosis on admission; n (%)					
Infection	350 (30.1)	158 (32.0)	79 (42.3)	92 (20.0)	21 (31.0)
Cardiovascular	288 (23.8)	86 (17.3)	27 (14.4)	156 (34.0)	19 (28.0)
Cancer	234 (19.3)	145 (29.2)	23 (12.3)	62 (13.2)	4 (5.9)
Gastrointestinal	35 (2.8)	14 (2.8)	2 (1.1)	17 (3.7)	2 (2.9)
Neurological	45 (3.7)	16 (3.2)	10 (5.3)	16 (3.5)	3 (4.4)
Transplant	99 (8.1)	31 (6.3)	17 (9.1)	46 (10.0)	5 (7.4)
Pulmonary	49 (4.0)	13(2.6)	10 (5.3)	22 (4.8)	4 (5.9)
Renal	20 (1.6)	5 (1.0)	3 (1.6)	9 (2.0)	3 (4.4)
Other	90 (7.4)	28 (5.6)	16 (8.6)	39 (8.5)	7 (10.3)
Target treatments of the catheter insertion; n (%)					
Antibiotic	763 (63.0)	387 (78.0)	144 (77.0)	232 (50.5)	-
Endovenous liquids	221 (18.2)	83 (16.7)	23 (12.3)	115 (25.1)	-
Diuretics	44 (3.6)	12 (2.4)	4 (2.1)	28 (6.1)	-
Chemotherapy	8 (0.66)	3 (7.3)	2 (1.1)	3 (0.7)	-
NPT	89 (7.3)	81 (16.3)	4 (2.1)	4 (0.9)	-
Analgesics	111 (9.1)	16 (3.2)	5 (2.7)	90 (2.0)	-
Vasoactive / Antiarrhythmic	35 (2.8)	28 (5.6)	2 (1.1)	5 (1.1)	-
Sedatives	46 (3.8)	23 (4.6)	8 (4.3)	15 (3.3)	-
Anticoagulants	4 (0.3)	1 (0.3)	-	3 (0.7)	-
Electrolytes	48 (3.9)	27 (5.4)	15 (8.0)	6 (1.3)	-
Thymoglobulin	16 (1.3)	13 (2.6)	1 (0.5)	2 (0.4)	-
Transfusions	21 (1.7)	11 (2.2	1 (0.5)	9 (2.0)	-

Table 1. General data related with insertion of the catheter. (Cont.)

Variable	Total *n* = 1,210	PICC *n* = 496	MLC *n* = 187	PVC *n* = 459	ALC *n* = 68
Laboratory	120 (9.9)	80 (16.1)	15 (8.0)	25 (5.4)	-
Procedure and location; n (%)					
Number of punctures					
1 puncture	796 (65.7)	334 (67.9)	134 (71.7)	290 (63.2)	38 (55.9)
2 punctures	230 (19.0)	69 (14.0)	36 (19.3)	106 (23.1)	19 (27.9)
>3 punctures	180 (14.8)	89 (18.1)	17 (9.1)	63 (13.7)	11 (16.2)
Midline relationship location					
Right	643 (53.1)	266 (53.6)	90 (40.1)	254 (55.3)	33 (48.5)
Ultrasound guided					
Yes	942 (77.8)	453 (91.3)	187 (100)	250 (54.5)	52 (76.5)

Average time at insertion and duration of the catheter. The time of opportunity, since the inter-consultation originated in the clinical services until verifying the catheter position after insertion of the PICC was 3.8 h. The average total time to catheter insertion by the group after hospital admission was 13.4 days. The shortest time to insertion since hospital admission was observed for the MLC insertion, while the longest insertion time was observed for the ALC (14.6 days). The average global time of catheter duration was 13.25 days (SD±25.2). The highest average catheter duration was the PICC with 25.3 days followed by the MLC (8.0 days), the ALC (5.3 days), and the PVC (3.1 days). (Table 2).

Table 2. Quality indicator: evaluation of the time to insertion and removal

Average time in days to the event between admission and insertion	
Catheter	**Mean (SD)**
PICC	11.85 (20.5)
MLC	11.0 (11.1)
PVC	16.1 (32.7)
ALC	14.6 (34.3)
Average time in days of catheter duration	
Catheter	**Mean (SD)**
PICC	25.3 (35.2)
MLC	8.0 (6.4)
PVC	3.1 (4.0)
ALC	5.3 (5.6)
Average opportunity time (hours)(SD)	
PICC	3.8 (4.5)

Result indicators. The catheter-related infection rate (CIR), documented through positive blood culture for PICC was of 1.9 x 1000 catheter-days [95%CI 1.2 to 2.8 days]. The rate of events related with signs and symptoms of phlebitis was 2.03 [95%CI 1.4 to 2.9; 30 events/14,713 catheter-days x 1000 catheter-days]. The individual evaluation of phlebitis for each catheter showed that for the PICC it was 0.2 [2 events /11.680 catheter-days x 1000, 95%CI 0.0 to 0.6], for Midline it was 5.7 [8 events/1.406 catheter-days x1000, 95%CI 2.5 to 11.1]; that observed in the arterial line was 2.9 [1 event in 342 catheter-days, 95%CI 0.1 to 16.2].

The rate of thrombosis associated with the PICC was of 0.52 [95%CI 0.2 to 1.1; 6 events/11680 catheter-days x1000], and with the arterial line it was 11.7 [95%CI 3.2 to 29.7, 4 events /342 catheter-days x1000]. The rate of catheter dysfunction was 9% [95%CI 8% to 12%;120 events/1.210 catheters inserted]. The infiltration rate was 7.6% (95%CI 6.0% to 9.0%; 92 events /1.210 catheters inserted). The rate of catheters reaching end of treatment was 57% (95%CI 55% to 61%; 701 catheters/1.210 catheters inserted).

Discussion

Vascular accesses are necessary devices in effective care of patients with critical pathologies and who require prolonged treatments during hospitalization. Safe hospitals must ensure the creation of structured programs to monitor the quality of the proper use of these devices.(9-11) This study describes the results of the evaluation of result indicators of the Devices Program for Vascular Access conducted by trained professional nurses and who lead the vascular access group in the institution where the research was conducted.

The indicators suggested by the Centers for Disease Control and Prevention (CDC) and the National Healthcare Safety Network (NHSN) Patient Safety Component(12,13) to be evaluated in VAD programs that showed successful results in our study included the time of opportunity, percentage of ultrasound-guided catheter insertions, percentage of success of the first insertion, adequate use of central catheters (PICC, MLC), time of permanence within the standards, low rate of infections associated to the catheter and types of dysfunctions.

One of the first indicators evaluated was time between the hospital admission and the final insertion of the catheter conducted by the VA Program, which was observed as prolonged (>12 days). This situation, which does not depend on the VAD group, is explained because upon admission of critical patients in emergency they receive as part of care management a peripheral catheter that is administered by the service staff. The new order for insertion of a PICC or an MLC, or other peripheral or an arterial line requires an inter-consultation request to the VAD group that can take place several days later. The time evaluated between this inter-consultation and the effective insertion of a catheter by the specialized VAD group is denominated time of opportunity. One of these times that was successful and effective was that of the PICC insertion, which was of 3.4 h, thus, permitting rapid initiation of a given treatment.

Delay in the inter-consultation to the program by the medical and paramedical staff constitutes only one determinant factor of the success and efficiency in hospital care. Other factors that can affect the success of the first insertion are the patient's factors [age, weight, body mass index, comorbidities, and skin characteristics], factors related with the procedure [insertion site and catheter caliber], and operator experience.(14) Moreover, success strategies in the first insertion include the technique that favors visualizing the vascular access, pain management and execution of the procedure by an expert.(14) Multiple failed punctures by non-expert staff cause skin lesions [edema, ecchymosis, ulcers, and infection] that are a barrier when selecting an insertion site for another catheter. Scarce evidence exists related with effective times between patient admission and the final insertion of catheters by specialized staff and its impact on the patient and the health system. Likewise, few studies have evaluated the rate of the first failed insertion. A study by Sabri *et al*., showed that the rate of failed events in adults was from 12% to 26% and from 24% to 54% in children.(14) Our study described an overall success rate during the first insertion of 65.7% [of 796 catheters/1,210], above that observed by Sabri *et al*., which may be explained by the short trajectory of the program.

Success on the first insertion may have been a consequence of using an ultrasound as guide to insert certain catheters. This study shows that insertion of PICC and MLC mostly (90% - 100%) was guided by ultrasound, and that the PVC were ultrasound-guided in lesser rate. Use of the ultrasound is a recommended practice not only to improve insertion efficacy, but at the same time can reduce infections by 11.7% per 1000 catheter-days, given by the decrease in failed attempts.(15,16) Another indicator observed shows that catheters inserted (PICC and LM) were used adequately for passage of substances with high osmolarity, such as analgesics, vasoactive drugs, electrolytes, blood, parenteral nutrition, and chemotherapy among others. Administration of high-variability substances with respect to osmolarity/mOsml and pH can lead to the presence of phlebitis or other serious skin complications and due to this use of MLC and PICC is indicated.(1,4)

Time of permanence is another indicator being evaluated by the CDC to reduce catheter-associated infections. Limited use of the central venous catheter [CVC] is recommended and in its place use of alternative catheters is recommended, like the MLC or PICC, for use in prolonged treatments.(17,18) Removal of these catheters is recommended upon suspending the treatment for which the catheter was inserted.(18) This study reported a duration time for the PVC of 3 days (expected standard of 66 h) and time for the MLC of 8 days (expected standard of 7.6 - 16.4 days), which are quite similar to the time ranges observed by other studies.(18) However, the duration time of the PICC was prolonged to 25.3 days in relation with expected standards (7.3 - 16.6 days).(18)

Although catheters are extremely necessary to administer medications and blood products, insertion and maintenance of a venous access can expose critically ill patients to catheter-associated infection risk.(19) These infections can appear 48 h after the catheter insertion and lead to morbidity and death.(19) The catheter infection rate in our center, evaluated for the PICC and the MLC, was of 1.9 per 1000 catheter-days. Some studies registered in a metanalysis have shown infection reduction of the catheter by implementing educational measures in the CVC, PICC, and MLC to 0 / per 1000 catheter-days (Canada in 2019), or a reduction to 1.8 per 1000 catheter-days in Korea and to 4.2 per 1.000 catheter-days in Spain.(13) Great variability exists in the reports in spite of the availability of Care Guides by the CDC, which still should improve.(8)

The impact of groups specialized in VAD has been associated with lower presence of phlebitis, erythema, induration, and infiltration.(1-3) Our study described for PICC a low rate of thrombosis (0.5 x 100 catheter-days) and of phlebitis (0.2 x 1000 catheter-days) according with the report by Chopra.(20) Nevertheless, the infection rate must be reduced as indication for our improvement plan.

The rate of catheters that since their insertion reached the end of treatment was 57%. This is an indicator of catheter maintenance and efficiency, but we consider it must increase in future improvement plans to prevent reinsertion of catheters and, thus, also prevent risks to patients, and the expense associated with the need for a second catheter, as revealed by some studies.(19-24)

Limitations. The study focused on describing the results of the evaluation indicators of a hospital vascular access program led by nursing in a tier IV hospital in Colombia. This can limit the generalization and applicability of the study results in other populations. Likewise, this study did not include description of other indicators that must be described, like hand washing, substances used in disinfecting the insertion site, and type of dressing used to protect the insertion site. Future studies are required to expand the findings with a bigger sample extended to other hospitals.

Conclusion. This descriptive study provides evidence that permits understanding and implementing the evaluation of a Vascular Access Device Program by using specific indicators employed globally for this purpose. Progress results were presented of a program led by professional nurses, highlighting the importance of the role of these caregivers in improving results that impact upon the quality of care and on hospital safety.

References

1. Ling M.L, Apisarnthanarak A, Jaggi N, *et al.* APSIC guide for prevention of Central Line Associated Bloodstream Infections (CLABSI). Antimicrob Resist Infect Control. 2016; 5(16). https://doi.org/10.1186/s13756-016-0116-5.
2. Centers for Disease Control and Prevention. Checklist for Central Line Associated Bloodstream Infections. (cited 15 Dec 2021. Available from: https://www.cdc.gov/hai/pdfs/bsi/checklist-for-CLABSI.pdf.
3. O'Neil C, Ball K, Wood H, McMullen K, Kremer P, Jafarzadeh, S., et al. A Central Line Care Maintenance Bundle for the Prevention of Central Line–Associated Bloodstream Infection in Non–Intensive Care Unit Settings. Infect. Control Hosp. Epidemiol. 2016; 37(6):692-8.
4. Muñoz T R, Marín NLo LM, Gallego-Sánchez JC. Cuidados de Enfermería en los accesos vasculares Guía de Recomendaciones. España. Edita: Área de Salud de Badajoz; 2019.
5. Gorski L, Hadaway L, Hagle ME, McGoldrick M, Orr M, Doellman D. Infusion therapy standards of practice. J. Infus. Nurs. 2019; 39(1S)2016. Available from: http://source.yiboshi.com/20170417/1492425631944540325.pdf
6. Caballero AF, Villarreal K. Ultrasound for central vascular access. A safety concept that is renewed day by day: review. Rev. Colomb. Anestesiol. 2018; 46(Suppl. 1):32-8.
7. Gorski LA, Hadaway L, Hagle ME, McGoldrick M, Orr M, Doellman D. Infusion therapy standards of practice. J. Infus Nurs. 2021; 44(suppl 1):S1-S224.
8. Foka M, Nicolaou E, Kyprianou T, Palazis L, Kyranou M, Papathanassoglou E, Lambrinou E. Prevention of Central Line-Associated Bloodstream Infections Through Educational Interventions in Adult Intensive Care Units: A Systematic Review. Cureus. 2021; 3(8):e17293.
9. Pathak R, Gangina S, Jairam F, Hinton K. A vascular access and midlines program can decrease hospital-acquired central line-associated bloodstream infections and cost to a community-based hospital. Clin. Risk Manag. 2018; 14:1453-6.
10. Thate JA, Couture B, Schnock KO, Rossetti SC. Information needs and the use of documentation to support collaborative decision-making: implications for the reduction of central line–associated blood stream infections. Comput. Inform. Nurs. 2021; 39(4):208–14.
11. Chapman LB, Kopp KE, Petty MG, Hartwig JL, Pendleton KM, Langer K, et al. Benefits of collaborative patient care rounds in the intensive care unit. Intensive Crit. Care Nurs. 2021; 63:102974.
12. U.S. Department of Health and Human Services. National Action Plan to Prevent Health Care-Associated Infections: Road Map to Elimination [Internet]. (cited 21 Apr 2021). Available at: https://health.gov/our-work/health-care-quality/health-care-associated-infections.
13. Xiong Z, Chen H. Interventions to reduce unnecessary central venous catheter use to prevent central-line–associated bloodstream infections in adults: a systematic review. Infect. Control Hosp. Epidemiol. 2018; 39(12):1442–8.

14. Sabri A, Szalas J, Holmes KS, Labib L, Mussivand T. Failed attempts and improvement strategies in peripheral intravenous catheterization. Biomed. Mater. Eng. 2013; 23(1-2):93-108.
15. Iordanou S, Middleton N, Papathanassoglou E, Palazis L, Raftopoulos V. Should the CDC's recommendations for promptly removing unnecessary centrally inserted central catheters be enhanced? Ultrasound-guided peripheral venous cannulation to fully comply. J. Vasc. Access. 2020; 21(1):86-91.
16. Elkhunovich M, Barreras J, Bock Pinero V, Ziv N, Vaiyani A, Mailhot T. The use of ultrasound for peripheral IV placement by vascular access team nurses at a tertiary children's hospital. J. Vasc. Access. 2017; 18(1):57-63.
17. Pallejà Gutiérrez E, López Carranza M, Jiménez PL, Vilches PL. Catéteres venosos de inserción periférica (PICC): un avance en las terapias intravenosas de larga permanencia. Nutr.Clín. Med. 2017; 11(2):114-7.
18. Beville ASM, Heipel D, Vanhoozer G, Bailey P. Reducing Central Line Associated Bloodstream Infections (CLABSIs) by Reducing Central Line Days. Curr. Infect. Dis. Rep. 2021; 23(12):23.
19. Johann DA, Danski MT, Vayego SA, Barbosa DA, Lind J. Risk factors for complications in peripheral intravenous catheters in adults: secondary analysis of a randomized controlled trial. Rev. LatAm Enfermagem. 2016; 24:e2833.
20. Haddadin Y, Regunath H. Central line associated blood stream infections (CLABSI). StatPearls. Epub 2017 Mar 28.
21. Morrell E. Reducing Risks and Improving Vascular Access Outcomes. J. Infus. Nurs. 2020; 43(4):222-8.
22. Fernández AY, García A, Orviz J, Fernández A, Del Valle M, González E. Device Selection for Vascular Access Guideline implementation at a regional hospital intensive care unit (ICU). Int. J. Integr. Care. 2019; 19(4):552.
23. Ista E, van der Hoven B, Kornelisse RF, van der Starre C, Vos MC, Boersma E, Helder OK. Effectiveness of insertion and maintenance bundles to prevent central-line-associated bloodstream infections in critically ill patients of all ages: a systematic review and meta-analysis. Lancet Infect. Dis. 2016; 16(6):724-34.
24. Iordanou S, Middleton N, Papathanassoglou E, Palazis L, Raftopoulos V. Should the CDC's recommendations for promptly removing unnecessary centrally inserted central catheters be enhanced? Ultrasound-guided peripheral venous cannulation to fully comply. J. Vasc. Access. 2020; 21:86–91.

Effect of a multimedia training programme for pain management on pain intensity and depression in patients with non-specific chronic back pain

Maryam Shaygan[1]
https://orcid.org/0000-0002-1456-9340
Azita Jaberi[2]
https://orcid.org/0000-0002-5350-3926
Roghayyeh Firozian[3]
https://orcid.org/0000-0002-6255-5680
Zahra Yazdani[4]
https://orcid.org/0000-0001-8078-8130
Nahid Zarifsanaiey[5]
https://orcid.org/0000-0002-1297-8271

Original article

Check for updates

UNIVERSIDAD
DE ANTIOQUIA
1803

Effect of Pain Management Training on Pain Intensity and Depression in Patients with Non-Specific Chronic Back Pain

Abstract

Objective. To determine the effect of multimedia training on pain intensity and depression in patients with chronic low back pain. **Methods.** In this randomized controlled trial study, the intervention group was trained about pain management consisted of communication skills, assertiveness, stress management, lifestyle enhancement skills and physical activity prepared in seven CDs using multimedia method and the control group received routine training included physician's visits, medication prescriptions and receiving the recommendations of the physician and healthcare providers. Beck Depression Inventory and Jensen Pain Questionnaire were completed for the two groups in three stages: pre-training, post-training and 2 months thereafter. **Results.** The results showed that there were no significant statistical difference

1 Associate Professor. Community Based Psychiatric Care Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.
Email: m2620.shaygan@gmail.com
2 Assistant Professor. Community Based Psychiatric Care Research Center. Shiraz University of Medical Sciences, Shiraz, Iran.
Email: azita635@yahoo.com.Corresponding author.
3 Nurse, Student Research Committee, Shiraz University of medical sciences, Shiraz, Iran.
E-mail: firoozianelahe@gmail.com
4 Nurse Educator. Department of Nursing, School of Nursing and Midwifery, Shiraz University of Medical Sciences, Shiraz, Iran.
Email: researchnu1397@gmail.com
5 Associate Professor. Department of eLearning planning in Medical Sciences, Center of excellence for electronic learning, Shiraz University of Medical Sciences, Shiraz, Iran. Email: sanaieyn@sums.ac.ir

Conflicts of interest: None.

Receipt: June 22, 2021.

Approved: March 3, 2022.

How to cite this article: Shaygan M, Jaberi A, Zarifsanaiey N, Yazdani Z, Firozian R. Effect of Pain Management Training on Pain Intensity and Depression in Patients with Non-Specific Chronic Back Pain. Invest. Educ. Enferm. 2022; 40(1):e13.

DOI: https://doi.org/10.17533/udea.iee.v40n1e13.

UNIVERSIDAD
DE ANTIOQUIA
1803

Investigación y Educación en
Enfermería
–Nursing Research and Education–

Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

between two groups in terms of demographic variables indicated homogeneity of research groups. Repeated measure ANOVA showed that the mean scores of pain intensity and depression changed significantly over time in both control and intervention groups ($p<0.001$); however, the effect of the group was not significant ($p=0.565$, $p=0.748$, respectively). Hence, the results of time-group interaction showed that there was significant difference between the two groups in terms of pain intensity and depression ($p<0.001$, $p=0.003$, respectively). The effect size revealed that the difference between mean scores of depression before and after the intervention in the both group was high (1.04 and 1.45, respectively). **Conclusion.** The study results indicated that multimedia training has the potential in relieving pain intensity and depression in patients with non-specific chronic low back pain.

Descriptors: pain management; low back pain; depression.

Efecto del entrenamiento con multimedia sobre la intensidad del dolor y la depresión en pacientes con dolor de espalda crónico no específico

Resumen

Objetivo. Determinar el efecto del entrenamiento con multimedia sobre la intensidad del dolor y la depresión en pacientes con lumbalgia crónica. **Métodos.** Ensayo clínico controlado y aleatorizado: el grupo de intervención recibió educación sobre el manejo del dolor consistente en unos temas (habilidades de comunicación, asertividad, manejo del estrés, habilidades para mejorar el estilo de vida y actividad física) disponibles en siete CD mediante el método multimedia; y el grupo de control recibió la educación rutinaria brindada durante las visitas al médico, consistente en la prescripción de medicamentos y la recepción de las recomendaciones del médico y de otros profesionales sanitarios. El Inventario de Depresión de Beck y el Cuestionario de Dolor de Jensen se aplicaron a los dos grupos en tres momentos: antes del entrenamiento, después del entrenamiento y dos meses después de acabar la intervención. **Resultados.** El ANOVA de medidas repetidas mostró que las puntuaciones medias de la intensidad del dolor y de la depresión cambiaron significativamente a lo largo del tiempo tanto en el grupo de control como en el de intervención ($p<0.001$); sin embargo, el efecto del grupo no fue significativo ($p=0.565$, $p=0.748$, respectivamente). Por lo tanto, los resultados de la interacción tiempo-grupo mostraron que sí había una diferencia significativa entre los dos grupos en cuanto a la intensidad del dolor y la depresión ($p<0.001$, *p*=0.003, respectivamente). El tamaño del efecto reveló que la diferencia entre las puntuaciones medias de depresión antes y después de la intervención en ambos grupos era alta (1.04 y 1.45, respectivamente). **Conclusión.** Los resultados del estudio indicaron que el entrenamiento multimedia tiene potencial para aliviar la intensidad del dolor y la depresión en pacientes con lumbalgia crónica inespecífica.

Descriptores: manejo del dolor; dolor de la región lumbar; depresión.

Efeito do treinamento com multimídia sobre a intensidade da dor e a depressão em pacientes com dor nas costas crónico não específico

Resumo

Objetivo. Determinar o efeito do treinamento com multimídia sobre a intensidade da dor e a depressão em pacientes com lombalgia crónica. **Métodos.** Ensaio clínico controlado e aleatório, o grupo de intervenção recebeu educação sobre o manejo da dor consistente nuns temas (habilidades de comunicação, assertividade, manejo do estresse, habilidades para melhorar o estilo de vida e atividade física) disponíveis em sete CD mediante o método multimídia; e o grupo de controle recebeu a educação rotineira brindada durante as visitas ao médico, consistente na prescrição de medicamentos e a recepção das recomendações do médico e de outros profissionais sanitários. O Inventário de Depressão de Beck e o Questionário de Dor de Jensen se aplicaram aos dois grupos em três momentos: antes do treinamento, depois do treinamento e dois meses depois de acabar a intervenção. **Resultados.** O ANOVA de medidas repetidas mostrou que as pontuações médias da intensidade da dor e da depressão mudaram significativamente ao longo do tempo tanto no grupo de controle como no de intervenção ($p<0.001$); porém, o efeito do grupo não foi significativo ($p=0.565$, $p=0.748$, respectivamente). Por tanto, os resultados da interação tempo-grupo mostraram que se havia uma diferença significativa entre os dois grupos enquanto à intensidade da dor e a depressão ($p<0.001$, $p=0.003$, respectivamente). O tamanho do efeito revelou que a diferença entre as pontuações médias de depressão antes e depois da intervenção em ambos os grupos era alta (1.04 e 1.45, respectivamente). **Conclusão.** Os resultados do estudo indicaram que o treinamento multimídia tem potencial para aliviar a intensidade da dor e a depressão em pacientes com lombalgia crónica inespecífica.

Descritores: manejo da dor; dor lombar; depressão.

Introduction

Chronic pain is one of the most important medical problems all around the world(1) contributed to disability, impaired quality of life, general health, and daily functioning, which in turn leads to the economic effects of using health services and unemployment hours.(2) Low back pain (LBP), a common type of chronic pain, is also accompanied with various consequences in physical and psychological health, and imposes financial burdens on families and healthcare system.(3) As a result, pain management is an essential aspect of patient care. On the other hand, it is well documented that there is an association between chronic pain and depression (4), with the prevalence rate of 33.9%.(5) Patients with LBP and depressive symptoms may be at risk of poorer recovery from LBP, poorer treatment outcomes or more health care utilization.(6) Therefore, it is important to consider pain management programs in order to reduce the depressive symptoms and consequent outcomes.

Clinical guidelines for chronic pain management suggest a multidisciplinary approach which includes a self-management framework with cognitive behavioral techniques, graded activities and exposure, skills training, education, and physical exercise.(7) Moreover, research investigated psychological factors of pain management programs outcome, such as depression, in some cases yielded contradictory findings.(8) Stress and anger management and assertiveness skills could reduce the stress in interpersonal communication and increase the relationships, which could eliminate the focus on pain. Besides, positive thinking skill would change the negative interpretation about pain and as a result would reduce the pain and depression in these patients.(9) It is noteworthy to mention that most pain management programs are implementing face-to-face. However, these programs generally require participants to engage in face-to-face sessions of moderate (30–60 hrs) to high (>60 hours) intensity and are mostly based in urban outpatient treatment facilities that restricts access for those living in rural areas.(7) Distance education methods such as multimedia in health were introduced as a solution for these kind of situations,(10) which can be performed via multimedia or internet-based methods.

Several Internet-based treatment programs for chronic pain have been developed, indicating efficacy in reducing disability, mood disturbance, and improving perceived self-efficacy.(11) However, the efficacy of these programs is variable due to methodological inconsistencies in the literature, including different outcome measures, key program content, types of control groups used, and clinician involvement.(12) Given the typically small to moderate effect sizes reported of Internet-based pain management programs, it is warranted to explore the viability of developing a novel program to improve treatment efficacy, such as multimedia methods.

Nonetheless, the studies conducted on multimedia methods for pain management are scarce. In a study, an interactive website along with multimedia eHealth pain management training resulted in decreasing the number of referrals to neurologists (13). In another study that interactive website, video messages and social media used for pain management campaign, the participants stated that if the healthcare providers could provide more information about this campaign, these interventions would be more useful.(14) The results of these studies shows that the multimedia could also use as a method of pain management training. Hence, there is limited information in this area in the culture of Asian countries, particularly Iran. Therefore, studies in different contexts and cultures are needed to provide more reliable results regarding the effects of pain management training on chronic LBP.(15) Furthermore, given the different environmental and treatment contexts, as well as the different types of pain and associated challenges for those with chronic pain, there is unlikely to be a single self-management method or strategy for all occasions or all people.(16) Considering the paucity of literature related to the multimedia training for pain management and in the light of aforementioned information, the present study was performed to examine the effect of pain management training on pain intensity and depression in patients with chronic nonspecific low back pain.

Methods

Design, settings, participants, eligibility criteria. This was a randomized controlled trial study with one experimental group (multimedia training group) and one control group and pre-test and post-test design conducted on patients with chronic low back pain referred to educational clinics affiliated to Fasa University of Medical Sciences from November 2018 to June 2019. Inclusion criteria included: Age over 18 years old, willingness to participate in research, chronic low back pain based on expert diagnosis according to physical examinations and diagnostic tests such as MRI, CT scan and imaging, having depression scores higher than 14 according to the Beck Depression Inventory. Exclusion criteria were: The reluctance or lack of possibility of continuing to participate in the research for any reason (such as the severity of the patient's pain), other chronic pains such as chronic headache, chronic psychiatric disorders such as schizophrenia, participation in similar training classes, lack of participation in more than two training sessions.

Sample size calculation. Sample size was calculated using the mean difference formula and the findings of a former study reporting that the $\alpha=0.05$, $\beta=0.2$, $(\mu_1-\mu_2)=4$ and $S=4.49$.(17) Considering the 10% attrition rate, a sample size of 66 was selected as 33 for each group. Convenience sampling method was used and then qualified patients were randomly assigned to multimedia training group and control group using the random number table.

Intervention. Two education methods were designed for pain management, namely multimedia and the routine care. Educational materials for multimedia groups were developed using pain management training-related resource.(18) In previous studies, pain management training has included different physical, psychological and behavioral components, i.e. communication skills, assertiveness, stress management, lifestyle enhancement skills and physical activity.(19) Educational materials for topics were prepared as PowerPoint presentation slides in Shareable Content Object Reference Model (SCORM) format, then scenarios and audio explanations about educational materials were added to each slide. Accordingly, seven sets of educational materials were prepared in seven CDs for seven educational sessions. Each week, one CD was provided to participants in the multimedia group and they were asked to watch it at home. After two weeks and watching two CDs, during a face to face meeting, contents of the CDs were reviewed, the patients were encouraged to use the educational contents and then an educational pamphlet was given to them. Moreover, a WhatsApp group was formed where the second author answered their questions and encouraged them for using educational materials. The contents of the CDs were presented were: *Session 1*- Training acute and chronic pain difference and how the psychological factors affect the experience of chronic pain; *Session 2*- Training appropriate sports exercises; *Session 3*- Effective communication skill; *Session 4*- Training assertiveness skill; *Session 5*- Training stress management; *Session 6*- Positive thinking skill; and, *Session 7*- Anger coping skill. Participants in the control group received routine care services. In these centers, patients with chronic low back pain refer to receive medical services. These routine services include physician's visits, medication prescriptions and receiving the recommendations of the physician and healthcare providers. At the end of the study, educational CDs were provided to participants in the control group and their questions were answered.

Measures. In this research, questionnaires for demographic characteristics, pain intensity, and depression were completed in three stages of pre-test (immediately before training) and post-test (after completing the training course) and one month after the end of the educational intervention during a visit by the researcher according to the time scheduled with the patient. The pain intensity was measured by Jensen's questionnaire. This questionnaire was developed by Jensen et al. in 2000. It is widely used in most studies related to pain, and it has reliability in all types of pain and populations. In the numerical scale method, pain is scored between 0-10 which the left side of the scale is numbered as no pain and right side as the most severe pain.(20) Results of previous studies confirmed the test-retest reliability, convergent validity (with other pain scales such as Visual Rating Scale) and discriminant validity.(21,22) Depression symptoms were measured by the short version of the inventory developed by Beck *et al*. known as Beck Depression Inventory-II (II-BDI). Similar to the first version, this inventory is composed of 21 items and each of which is scored between 0 -3 based on the intensity level reported by the patient. Scores of 0-13 indicate minimal depression, scores of 14-19 denote mild depression, 20-28 as moderate and 29-63 as severe depression.(23) According to Beck, Steer, and Garier, the second version also indicates the presence and intensity of depression symptoms in patients and normal population. They reported the internal consistency of this version as 0.73-0.92 with an average of 0.86 and an alpha coefficient of 0.86 for patients and 0.81 for non-patients.(24) The psychometric properties of this inventory in a sample of 94 people in Iran were confirmed by calculating the alpha coefficient of 0.91. The coefficient of correlation between the two half-tests was 0.89, and the re-test coefficient was 94.4.(25)

Data analysis. Data were analyzed at descriptive and inferential levels. To describe nominal and ordinal data, frequency distribution, number, and percent, and for interval and ratio data, descriptive, mean, and standard deviation were used. In inferential statistics, Chi-square, pair-wise t-test, ANOVA, and Pearson correlation coefficient were used, and repeated measurement tests were used to test the hypotheses. Data were analyzed by SPSS-22 software at the significance level of 0.05.

Ethical considerations. After being confirmed by the Ethics Committee of Shiraz University of Medical Sciences (IR.SUMS.REC.1396.117) and obtaining the approval of the authorities, the researchers attended in study settings. Afterwards, they asked the patients who were willing to take part in the study and took their consent. The study participants were fully aware of the study objectives and methodology. Maintaining the participants' anonymity and data confidentiality, and the ability to leave the study at any stage were other ethical considerations. IRCT registration code: IRCT20180313039074N1.

Results

The results showed that most of participants in the intervention group were female (83.3%), had academic education (40%), married (66.67%), with a mean age of 47.4 ± 7.5. In control group, most of them were female (66.7%), had academic education (50%), married (83.3%) with mean age of 53.2±12.6. No significant statistical difference was observed between two groups in terms of demographic variables such as age, sex, marital status, educational level, job, and duration of low back pain, which indicated homogeneity of research groups (Table 1).

Table 1. Demographic characteristics of the participants

Categories	Control (*n*=30)	Multimedia (*n*=30)	*p*-value
Age; mean±SD	53.2±12.6	51±9.7	0.458
Duration of back pain; mean±SD	8.6±5.2	8.23±6	0.802
Sex; *n* (%)			
Female	20 (66.7)	25 (83.3)	0.233
Male	10 (33.3)	5 (16.7)	
Education; *n* (%)			
Primary/secondary education	5 (16.7)	7 (23.3)	0.7
High school certificate	10 (33.3)	11 (36.7)	
College or university degree	15 (50)	12 (40)	
Marriage status; *n* (%)			
Single	2 (6.7)	4 (13.33)	0.329
Married	25 (83.3)	20 (66.67)	
Divorce/ Widowed	3 (3.3)	6 (20)	
Employment; *n* (%)			
Housewife	11 (36.7)	12 (40)	0.926
Employed	14 (46.7)	14 (46.67)	
Retired	5 (16.7)	4 (13.33)	

Repeated measure ANOVA showed that participants' pain intensity and depression changed significantly over time in both control and intervention groups ($p<0.001$). Regarding the differences between the groups, the results showed that regardless of the time, the groups were not significantly different from each other, that is, in each of the 3 time periods, the two groups were not significantly different in terms of pain intensity and depression ($p=0.565$, $p=0.748$, respectively). Regarding the interaction of time and group, the findings indicated that the two groups were significantly different, which means the intervention in the multimedia group caused significant changes compared to the control group ($p<0.001$, $p=0.003$, respectively) (Table 2). However, before the intervention, the mean of depression scores in intervention group was higher than control group. The results of ANCOVA also showed that in assessing the effect of demographic data and the group simultaneously, there was no significant difference between two groups regarding pain intensity and depression. Moreover, to clarify the actual effect of the intervention on pain and depression, the effect size was calculated, which revealed that the difference between mean scores of depression before and after the intervention in the both group was high (1.04 and 1.45, respectively) (Table 2).

Table 2. Results of repeated measurement ANOVA for Pain intensity and depression

Measure	Pain intensity		Depression	
	Control	**Intervention**	**Control**	**Intervention**
Pretest	4.9±2.19	5.43±2.16	15.63±4.26	17.73±6.04
Post test	5.13±1.96	4.37±1.93	10.3±5.8	9.03±5.91
Follow up	4.97±1.94	4.1±1.65	9.73±6.2	7.83±5.26
p-value (Time effect)	<0.001		<0.001	
p-value (Group effect)	0.565		0.748	
p-value (Time*group interaction)	<0.001		0.003	
Pre-post effect size	0.11	0.52	1.04	1.45
Pre-follow up effect size	0.08	0.15	0.09	0.21

Discussion

Current research was conducted aiming at investigating the impact of the multimedia training of pain management on pain intensity and depression in patients with non-specific chronic LBP. Concerning the research objectives, the results of the study indicated that multimedia training has the potential in relieving pain intensity and depression in patients with non-specific chronic low back pain. The results depicted that the mean scores of pain intensity and depression changed significantly over time in both control and intervention groups; however, the effect of the group was not significant. Hence, the results of time-group interaction showed that there was significant difference between the two groups in terms of pain intensity and depression.

The results of the present study are consistent with some other research. For example internet-based education improved the pain intensity in chronic back pain.(26) In some other studies multimedia pain management training has also been found to be effective as a mHealth method.(14) To explain the effect of multimedia education on pain and depression, the content of CDs might be the key point. It is well established in previous literature that social factors have been linked to the etiology and maintenance of chronic pain. One salient social factor is early life stress. As a result of social challenges, individuals may face elevated risks of chronic physical pain due to a variety of factors, including an insecure styles of interpersonal attachment. Another socially based negative emotional state that has been found to be a predictive of later pain intensity is daily ratings of loneliness. Moreover, individuals with chronic pain tend to appraise their social relationships more negatively when experiencing elevated levels of stress or negative emotion.(9) These findings suggest that both the presence of social conflict and the evaluation of one's social relationships have implications for emotional states in chronic pain. Consistently, Sturgeon *et al*. also believed that encouraging adaptive interpersonal communication along with increasing adaptive behaviors could help patients to cope with chronic pain.(27) All aforementioned studies emphasized the inclusion of stress management and interpersonal communication skills in pain management training,(28) as we did in present study. On the other hand, face to face meeting every two weeks, answering the participants' questions, encouraging them to use the methods explained in CDs and providing educational pamphlets helped the consolidation of learning. This is in line with the opinion of the educational investigators about "blended learning". They believe that distance education methods are not enough for learning and should be combined with face to face methods and feedback and reflection about teaching/learning should be performed.(29)

To explain the elimination of depression, it could be said that the causative agent for depression is not just the pain experience, but psycho-social factors and especially cognitive/believe thought factors are also effective. Negative thoughts about pain, interpreting pain as a mysterious and non-understandable phenomenon, and not having control over pain feeling are some of these factors.(30) Although there was no intervention in the control group, the mean scores of depression also decreased in this group. However, this decrease was greater in the multimedia group. Regarding this, it can be said that education was not the only factor in reducing depression and depression was not only a result of pain in patients and other factors were involved. Inaccuracy and attention of patients in answering questionnaire questions can also be one of the causes of decrease in depression score after intervention. Another limitation of this study was the exclusive reliance on self-reports for the quantitative data. It is an assumption that people would be as honest as possible to the extent that they were aware of their own thoughts, feelings, and functional abilities at the time of the data collection. Nonetheless, some patients with chronic pain may either exaggerate or minimize their reports of pain.

Although based on the results of this study, demographic factors such as age, gender, education, marriage status and job did not have a confounding effect on pain and depression, there might be other factors not addressed in this study such as other stressors in life and job, using specific drugs with depressive side effects and sleep disorders as mediating factors. As such, studying the effect of these factors should be warranted in the future studies.

Conclusion. The positive effect of multimedia pain management training on pain intensity and depression level in patients with chronic low back pain indicates that these methods could help to reduce the pain and suffering of them. Also, considering non-medical methods in the treatment of these patients, in addition to reducing pain, would help reduce their depression. Nurses and other health team members who care for these patients could help alleviate this agony using these methods. Future studies into chronic LBP management are recommended to assess the effects of pain management training on different aspects of pain such as pain-related interference, pain tolerance, and quality of life. Moreover, studies with similar pain intensity and depression level assessment methods are recommended to produce comparable results.

References

1. Zernikow B, Kriszio H, Frosch M, Dobe M, Wager J. Pain Disorder: A Biopsychosocial Disease. Practical Treatment Options for Chronic Pain in Children and Adolescents: Springer; 2019. p. 7-34.
2. Orki M, Mehdizade A, Dortaj A. Comparing the effectiveness of emotion regulation-focused cognitive-behavior therapy and acceptance and commitment therapy on reducing the backache symptoms and depression and increasing life satisfaction in women suffering from chronic backache with commorbid major depressive disorder. Quartarely J. Psychol. Health 2018; 7(26):25-43 [persian].
3. Dueñas M, Ojeda B, Salazar A, Mico JA, Failde I. A review of chronic pain impact on patients, their social environment and the health care system. J. Pain Res. 2016; 9:457.
4. Lerman SF, Rudich Z, Brill S, Shalev H, Shahar G. Longitudinal associations between depression, anxiety, pain, and pain-related disability in chronic pain patients. Psychosoma. Med. 2015; 77(3):333-41.
5. Lee H-J, Choi EJ, Nahm FS, Yoon IY, Lee PB. Prevalence of unrecognized depression in patients with chronic pain without a history of psychiatric diseases. Korean J. Pain. 2018; 31(2):116.
6. Tuck AN, Scribani MB, Grainger SD, Johns CA, Knight RQ. The 9-Item Patient Health Questionnaire (PHQ-9): an aid to assessment of patient-reported functional outcomes after spinal surgery. Spine J. 2018; 18(8):1398-405.
7. Schultz R, Smith J, Newby JM, Gardner T, Shiner CT, Andrews G, et al. Pilot trial of the Reboot Online program: An Internet-delivered, multidisciplinary pain management program for chronic pain. Pain Res. Manag. 2018; 2018:9634727.
8. Oosterhaven J, Wittink H, Mollema J, Kruitwagen C, Deville W. Predictors of dropout in interdisciplinary chronic pain management programmes: a systematic review. J. Rehabilit. Med. 2019; 51(1):2-10.
9. Lumley MA, Schubiner H. Psychological therapy for centralized pain: an integrative assessment and treatment model. Psychosom. Med. 2019; 81(2):114-24.
10. Clark RC, Mayer RE. E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning: John Wiley & Sons; 2016.
11. Vugts MA, Joosen MC, van der Geer JE, Zedlitz AM, Vrijhoef HJ. The effectiveness of various computer-based interventions for patients with chronic pain or functional somatic syndromes: A systematic review and meta-analysis. PloS one. 2018; 13(5):e0196467.
12. Heapy AA, Higgins DM, Cervone D, Wandner L, Fenton BT, Kerns RD. A systematic review of technology-assisted self-management interventions for chronic pain. Clin. J. Pain. 2015; 31(6):470-92.
13. Suman A, Schaafsma FG, Van De Ven PM, Slottje P, Buchbinder R, Van Tulder MW, et al. Effectiveness of a multifaceted implementation strategy compared to usual care on low back pain guideline adherence among general practitioners. BMC Health Serv. Res. 2018; 18(1):358.
14. Suman A, Schaafsma FG, Bamarni J, Van Tulder MW, Anema JR. A multimedia campaign to improve back beliefs in patients with non-specific low back pain: a process evaluation. BMC Musculoskelet. Disord. 2017;18(1):200.
15. Kovacs FM, Seco J, Royuela A, Corcoll-Reixach J, Peña-Arrebola A, Network SBPR. The prognostic value of catastrophizing for predicting the clinical evolution of low back pain patients: a study in routine clinical practice within the Spanish National Health Service. Spine J. 2012; 12(7):545-55.
16. Nicholas MK, Blyth FM. Are self-management strategies effective in chronic pain treatment? Pain management. 2016;6(1):75-88.
17. Sajadinejad MS, Mohammadi N, Taghavi SMR, Ashgazadeh N. Therapeutic effects of cognitive-behavioral group therapy on headache disability and depression in patients with migraine and tension headache. Iranian Journal of psychiatry and clinical psychology. 2009;14(4):411-8 [persian].
18. Viana SG. 99 Activities to Nurture Successful and Resilient Children: A Comprehensive Programme to Develop Fundamental Life Skills: Routledge; 2017.
19. Ashton-James CE, Ziadni MS. Uncovering and Resolving Social Conflicts Contributing to Chronic Pain: Emotional Awareness and Expression Therapy. Journal of Health Service Psychology. 2020;46(3):133-40.

20. Jensen MP, Karoly P, Braver S. The measurement of clinical pain intensity: a comparison of six methods. Pain. 1986;27(1):117-26.
21. Ruskin D, Lalloo C, Amaria K, Stinson JN, Kewley E, Campbell F, et al. Assessing pain intensity in children with chronic pain: convergent and discriminant validity of the 0 to 10 numerical rating scale in clinical practice. Pain Res. Manag. 2014; 19(3):141-8.
22. Sendlbeck M, Araujo EG, Schett G, Englbrecht M. Psychometric properties of three single-item pain scales in patients with rheumatoid arthritis seen during routine clinical care: a comparative perspective on construct validity, reproducibility and internal responsiveness. RMD Open. 2015; 1(1):e000140.
23. Beck AT, Steer RA, Brown GK. Beck depression inventory-II. 1996; San Antonio, TX: Psychological Corporation.
24. Beck AT, Steer RA, Carbin MG. Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. Clin. Psychol. Rev. 1988; 8(1):77-100.
25. Fata L, Birashk B, Atefvahid M, Dabson K. Meaning assignment structures/schema, emotional states and cognitive processing of emotional information: comparing two conceptual frameworks. Iran. J. Psychiatr. Clin. Psychol. 2005; 11(3):312-26.
26. Nevedal DC, Wang C, Oberleitner L, Schwartz S, Williams AM. Effects of an individually tailored web-based chronic pain management program on pain severity, psychological health, and functioning. J. Med. Internet Res. 2013; 15(9):e201.
27. Sturgeon JA, Zautra AJ. Social pain and physical pain: shared paths to resilience. Pain Manag. 2016; 6(1):63-74.
28. Shaygan M, Jaberi A. The effect of a smartphone-based pain management application on pain intensity and quality of life in adolescents with chronic pain. Sci. Rep. 2021;11(1):6588.
29. Winstone N, Carless D. Designing effective feedback processes in higher education: A learning-focused approach: Routledge; 2019.
30. Vakili N, ND M. The effect of cognitive-behavioral group pain management therapy on depression of the female with chronic low back pain. J. Clin. Psychol. 2009; 1(4):11-9.

Comparison of the effectiveness of home visits and telephone follow-up on the self-efficacy of patients having undergone coronary artery bypass graft surgery (CABG) and the burden of their family caregivers: A randomized controlled trial

Original article

UNIVERSIDAD
DE ANTIOQUIA
1803

Foruzan Gohari[1,7]
https://orcid.org/0000-0002-3484-8144
Shirin Hasanvand[2,7]
https://orcid.org/0000-0002-0243-9696
Mohammad Gholami[3,7]
https://orcid.org/0000-0001-5553-2651
Heshmatolah Heydari[4,7]
https://orcid.org/0000-0002-3520-4199
Parastoo Baharvand[5,7]
https://orcid.org/ 0000-0002-0350-7312
Mohammad Almasian[6,7]
https://orcid.org/0000-0002-2680-1872

1 Student Research Center.
Email:goharif52@yahoo.com
2 Associate Professor, Social Determinants of Health Research Center.
Email: hasanvand.sh@lums.ac.ir.
Corresponding author.
3 Associate Professor.
Email: mohammad13565@yahoo.com.
4 Associate Professor. Email: hidari74@gmail.com.
5 Associate Professor.
Email:Dr.baharvand@gmail.com
6 Instructor. Email: almasian.m@lums.ac.ir
7 Lorestan University of Medical Sciences, Khorramabad, Iran.

Conflicts of interest: None.

Receipt: August 24, 2021.

Approved: March 3, 2022.

How to cite this article: Gohari F, Hasanvand Sh, Gholami M, Heydari H, Baharvand P, Almasian M. Comparison of the effectiveness of home visits and telephone follow-up on the self-efficacy of patients having undergone coronary artery bypass graft surgery (CABG) and the burden of their family caregivers: A randomized controlled trial. Invest. Educ. Enferm. 2022; 40(1):e014.

DOI: https://doi.org/10.17533/udea.iee.v40n1e014.

Comparison of the effectiveness of home visits and telephone follow-up on the self-efficacy of patients having undergone coronary artery bypass graft surgery (CABG) and the burden of their family caregivers: A randomized controlled trial

Abstract

Objective. This study aimed to compare home visits and telephone follow-up effectiveness on patients' self-efficacy undergoing Coronary Artery Bypass Graft Surgery –CABG- and caregivers' burden. **Methods.** In this randomized clinical trial, 114 patients undergoing CABG were assigned to the three groups of home visits, telephone follow-up, and control based on the stratified block randomization. The self-management program of the home visit group included four face-to-face 60-minute training sessions once a week, and for the telephone follow-up group, four 30-minute telephone counseling sessions twice each week for a month. The control group received routine care. Data were collected using the cardiac rehabilitation self-efficacy questionnaire and the caregiver burden scale before and after the intervention. **Results.** Before the study, there were no statistically significant differences between the three groups in terms of the means of self-efficacy and caregiver burden scores. However, there was a statistically significant difference between the home visit and control groups ($p<0.001$) and between the telephone follow-up and control groups ($p<0.001$) after the intervention, with increased self-efficacy and reduced caregiver burden reported. In contrast, there was no significant difference between the home visit and telephone follow-up groups regarding self-efficacy and caregiver burden scores. **Conclusion.** Both methods of self-management education have similar effectiveness in increasing self-efficacy and reducing the caregiver burden after discharge for patients who have undergone CABG.

Descriptors: self efficacy; coronary artery bypass; self-management; house calls; telenursing; caregivers.

Comparación de la efectividad de las visitas domiciliarias y el seguimiento telefónico sobre la autoeficacia de los pacientes sometidos a cirugía de derivación arterial coronaria con injerto y la carga para sus cuidadores familiares: Un ensayo controlado aleatorio

Resumen

Objetivo. Comparar la eficacia de las visitas domiciliarias y del seguimiento telefónico sobre la autoeficacia de los pacientes sometidos a cirugía de derivación arterial coronaria con injerto (CABG en inglés) y la carga de sus cuidadores. **Métodos.** En este ensayo clínico aleatorio, 114 pacientes sometidos a CABG se asignaron a uno de los tres grupos de investigación: visitas domiciliarias, seguimiento telefónico y control sobre la base de la aleatorización en bloque estratificada. El programa de educación en autoeficacia en el grupo de visitas domiciliarias incluía cuatro sesiones presenciales de formación de 60 minutos una vez a la semana, y para el grupo de seguimiento telefónico, cuatro sesiones de asesoramiento telefónico de 30 minutos dos veces por semana por un mes. El grupo de control recibió atención rutinaria. Los datos se recogieron mediante el cuestionario de autoeficacia de la rehabilitación cardíaca y la escala de carga del cuidador antes y después de la intervención. **Resultados.** Antes del estudio, no hubo diferencias entre los tres grupos en cuanto a las medias de las puntuaciones de las escalas de autoeficacia y carga del cuidador. Sin embargo, se encontró una diferencia estadísticamente significativa entre los grupos de visitas domiciliarias y de control ($p<0.001$) y entre los grupos de seguimiento telefónico y de control ($p<0.001$) después de la intervención, con un aumento de la autoeficacia y una reducción de la carga del cuidador. Es de anotar que no hubo diferencias significativas entre los grupos de visita domiciliaria y de seguimiento telefónico en cuanto a las puntuaciones de autoeficacia y de carga del cuidador. **Conclusión.** Ambos métodos de educación en este estudio tuvieron una efectividad similar en el aumento de la autoeficacia y la reducción de la carga de los cuidadores tras el alta de los pacientes sometidos a CABG.

Descriptores: autoeficacia; puente de arteria coronaria; automanejo; visita domiciliaria; teleenfermería; cuidadores.

Comparação da efetividade das visitas domiciliares e o seguimento telefónico sobre a autoeficácia dos pacientes submetidos a cirurgia de derivação arterial coronária com enxerto e a carga para seus cuidadores familiares: Um ensaio controlado aleatório

Resumo

Objetivo. Comparar a eficácia das visitas domiciliares e do seguimento telefónico sobre a autoeficácia dos pacientes submetidos a cirurgia de derivação arterial coronária com enxerto (CABG em inglês) e a carga dos seus cuidadores. **Métodos.** Neste ensaio clínico aleatório, 114 pacientes submetidos a CABG foram designados a um dos três grupos de investigação: visitas domiciliares, seguimento telefónico e controle sobre a base aleatorizada em blocos estratificada. O programa de educação em autoeficácia no grupo de visitas domiciliares incluía quatro sessões de formação presenciais de 60 minutos uma vez por semana, e para o grupo de seguimento telefónico, quatro sessões de assessoramento telefónico de 30 minutos duas vezes por semana durante um mês. O grupo de controle recebeu atenção rotineira. Os dados se recolheram mediante o questionário de autoeficácia da reabilitação cardíaca e a escala de carga do cuidador antes e depois da intervenção. **Resultados.** Antes do estudo, não houve diferenças entre os três grupos enquanto às médias das pontuações das escalas de autoeficácia e carga do cuidador. Porém, se encontrou uma diferença estatisticamente significativa entre os grupos de visitas domiciliares e de controle ($p<0.001$) e entre os grupos de seguimento telefónico e de controle ($p<0.001$) depois da intervenção, com um aumento da autoeficácia e uma redução da carga do cuidador. É importante anotar que não houve diferenças significativas entre os grupos de visita domiciliar e de seguimento telefónico enquanto às pontuações de autoeficácia e de carga do cuidador. **Conclusão.** Ambos os métodos de educação neste estudo tiveram uma efetividade similar no aumento da autoeficácia e a redução da carga dos cuidadores após a alta dos pacientes submetidos a CABG.

Descritores: autoeficácia; ponte de artéria coronária; autogestão; visita domiciliar; telenfermagem; cuidadores.

Introduction

Following the increasing prevalence of coronary artery disease and the resulting mortality, coronary artery bypass graft is one of the primary and most common surgical procedures in the treatment of cardiovascular diseases, such that about 8 million people undergo CABG globally each year, about 40 000 of which are performed in Iran.(1) The advantages of CABG include alleviation of symptoms, increased survival rates, and improvements in patient function. However, many physical, mental, and social problems may occur after the operation. These problems include shortness of breath, pain in the incision area, weakness, insomnia, fear, leg edema, wound infection, palpitations, and digestive problems.(2) A study reported that 69% of patients experienced shortness of breath, 39% sleep disorders, 39% incisional pain, and 18% anorexia three weeks after surgery.(3)

Since the continuation of these complications reduces the quality of life (QoL) of patients,(2) reducing complications after open-heart surgery is an essential factor, and improving the self-efficacy of patients and caregivers can play a significant role in improving the condition of patients after surgery.(4) Self-efficacy is the belief that a person has performed an activity successfully.(5) Providing special education to patients and raising their awareness of risk factors(6) and the treatment and control of the disease leads to improved health, adherence to the recommended therapies, facilitation of healthy habits and behaviors, and adjustment of mental status, and thus increases their self-efficacy.(7) However, the results of many studies indicate that the self-efficacy of cardiac patients is weak to moderate.(8,9) One study reported poor self-efficacy in heart disease patients.(10) In addition to low self-efficacy, patients often rely on the family for self-care during recovery,(11) and most family caregivers are responsible for administering medications, facilitating communication, and continued emotional support. Caregivers, as individuals vulnerable to the mentioned problems and most notably responsible for managing financial issues, experience anxiety, depression, and concerns about the possibility of losing the patient, and may suffer from mood disorders and lose their courage. At the same time, their underlying diseases are ignored.(12)

Therefore, in order to maintain healthy behaviors, such as adherence to medications, quitting smoking, weight control, regular exercise, and a healthy diet, and as a result, to improve heart patients' self-efficacy and to reduce the subsequent caregiver burden, there is a need to develop and implement self-management interventions.(13) Self-management is recognized as a method to help patients with chronic conditions enjoy the best possible quality of life.(14) The concept of self-management is derived from the cognitive learning theory and is defined as the ability of an individual to manage symptoms, treatment, physical and psychological outcomes, and to modify lifestyle in dealing with a chronic disease.(15) Self-management programs can increase patients' awareness and ability to manage disease symptoms, perform self-care behaviors, and increase patients' self-efficacy.(16) Home-based cardiac rehabilitation self-management programs, including monitoring and follow-up visits, are conducted in person, by telephone, or online with the help of healthcare professionals.(15) Homecare services are provided worldwide and have different meanings for different countries. This care method is provided during the recovery process and after the patient is discharged, especially during the first few weeks after discharge. The provision of home care services varies depending on the cultural context of each community.(17)

As one of the most critical components of home care, home visits have reduced patient readmissions by 25% and reduced treatment costs significantly.(18) Despite the effectiveness of homecare follow-ups, this method requires considerable quantities of human resources, time, and money. Therefore, using means of distance communication such as telephone calls to follow up on patients' homecare has been proposed to solve these problems.(8) Follow-up calls by nurses can be used as a valuable method for information exchange, symptom checks, rapid detection of complications, improvement of clinical condition, improvement of quality of life, and providing reassurance to the patient and his/her family.(19) However, while the use of home care services has been on the rise worldwide in recent years and despite advances in remote care, people generally have many problems with the use of smartphones, tablets, laptops, or computers, which are more pronounced in countries such as Iran.(20) In 2011, the American Heart Association announced that home-based rehabilitation could be a viable option for heart patients and a study found that providing home-based services to patients with heart problems could improve their quality of life.(21)

However, this healthcare method has not been institutionalized in Iran, a developing Middle Eastern country, where the burden of chronic diseases and population aging is increasing.(22) Additionally, hospital services take precedence over community-based services in the Iranian health system, and there are barriers to the provision of homecare such as cultural issues, society's negative perception about the role of nurses, lack of insurance coverage, safety and security issues, and lack of trust in nurses.(17) In many subspecialty cardiac hospitals in Iran, open-heart surgery is performed, but most hospitals do not have written plans to follow up on these patients in the community after discharge. Many patients develop various physical and psychological complications after discharge. The Shahid Madani Cardiac Hospital of the Lorestan Province of Iran, as the only subspecialty hospital in the province, provides services to 1760649 people. There is no post-discharge follow-up system in this province, and many patients suffer from various physical and mental complications after discharge.

On the other hand, the wide geographical distribution of patients' residences necessitates some services performed in absentia. It seems that providing community-based services can alleviate some of the patients' problems. Given that no studies were found to have evaluated the effectiveness of different community-based care methods for open-heart surgery patients, this study aimed to compare the effectiveness of home visits and follow-up calls on the self-efficacy of patients who had undergone CABG and the burden of family caregivers.

Methods

This pretest-posttest randomized controlled trial was conducted from July 2018 to August 2019 in one of the Lorestan University of Medical Sciences hospitals. First, 205 people were selected, and after reviewing their medical records and considering the inclusion criteria, 120 patients were enrolled in the study. With a dropout rate of 5%, 114 patients who had undergone CABG and had been discharged from the open-heart surgery intensive care unit completed the study.

Inclusion criteria were willingness to participate in the study, a history of coronary artery bypass surgery (under cardiopulmonary pump), an age range of 30 to 70 years, number of grafts (three, four, or five), access to a landline or mobile phones, and living within a 90 km maximum radius from the city of Khorramabad. Exclusion criteria included unwillingness to participate in the study for any reason, previous history of participation in cardiac rehabilitation programs, presence of any known psychiatric or psychomotor disorders, suffering from any hearing, vision, and speech disorders, suffering from chronic debilitating diseases, readmission, death of the patient, and researchers' inability to reach the patient and the occurrence of acute physical or mental disorders in the patient. For caregivers, inclusion criteria were willingness to participate in the study, direct caregiver, literate, 18 years old and older. The exclusion criteria for caregivers were unwillingness to continue cooperation with the researchers, the caregiver's unwillingness to continue caring for the patient, having restrictive neurological or motor diseases, and having a background in medical sciences.

Then, based on block randomization, the participants were placed in one of three groups in the self-management program: follow-up calls, home visits, and control. Thus, we had 20 blocks with a six-letter arrangement, including two A letters, two B letters, and two C letters. group A received home visits, group B was the follow-up calls group, and group C was the control group. The individuals were entered into each group in the order of the selected blocks using the arrangement inside the blocks at random by a researcher colleague who was unaware of the groups. The sample size was determined for each group as 40 people based on comparing the two means, based on similar studies on self-efficacy.(23)

Of the 120 patients initially admitted to the study, six were excluded for some reason. The final number of participants for each group was 38 for the Telephone follow-up group), 37 for the home visits group, and 39 for the control group (Figure 1). Individuals were randomized into each group in the order of the letter of the selected blocks using the internal arrangement of the block. The number of strata of the blocks was 20, and the arrangement inside each block consisted of 6 participants, including two participants for each study group. The home visits group was designated with the letter A, the telephone follow-up group was designated with the letter B, and the letter C was assigned to the control group. The self-management program was followed up on both intervention groups one day after discharge and usually starting at four PM. One of the researchers (the first author), a nurse in the Cardiac Surgery Intensive Care Unit with about ten years of experience in this department, answered patients' questions from 8:00 AM to 11:00 PM. At the beginning of each session before starting the follow-up intervention, an initial assessment of the patient regarding the amount of information the patient had and the desire to learn, and an estimation of the patient's educational needs was carried out, and the necessary interventions and training were performed based on the results of the initial assessment.

The self-management program focused on education on issues such as 1. background information on heart disease and surgery, 2. how to exercise and stay active, sleep, rest, and daily activities, 3. diet, 4. the prescribed medications, 5. risk factor management, 6. observance of personal health, 7. how to take care of surgical wounds, and 8. follow-up and subsequent referrals and psychological counseling and interventions with the help of a psychologist, if necessary. In order to organize the training, an educational booklet was used, the content of which was prepared by reviewing authoritative textbooks, articles, and guidelines and considering the needs of CABG patients. The qualitative comments of 8 specialists, including three nursing faculty members, a cardiovascular surgeon, two cardiovascular nurses, a nutritionist, and a psychologist, were used to verify the content validity of the booklet.

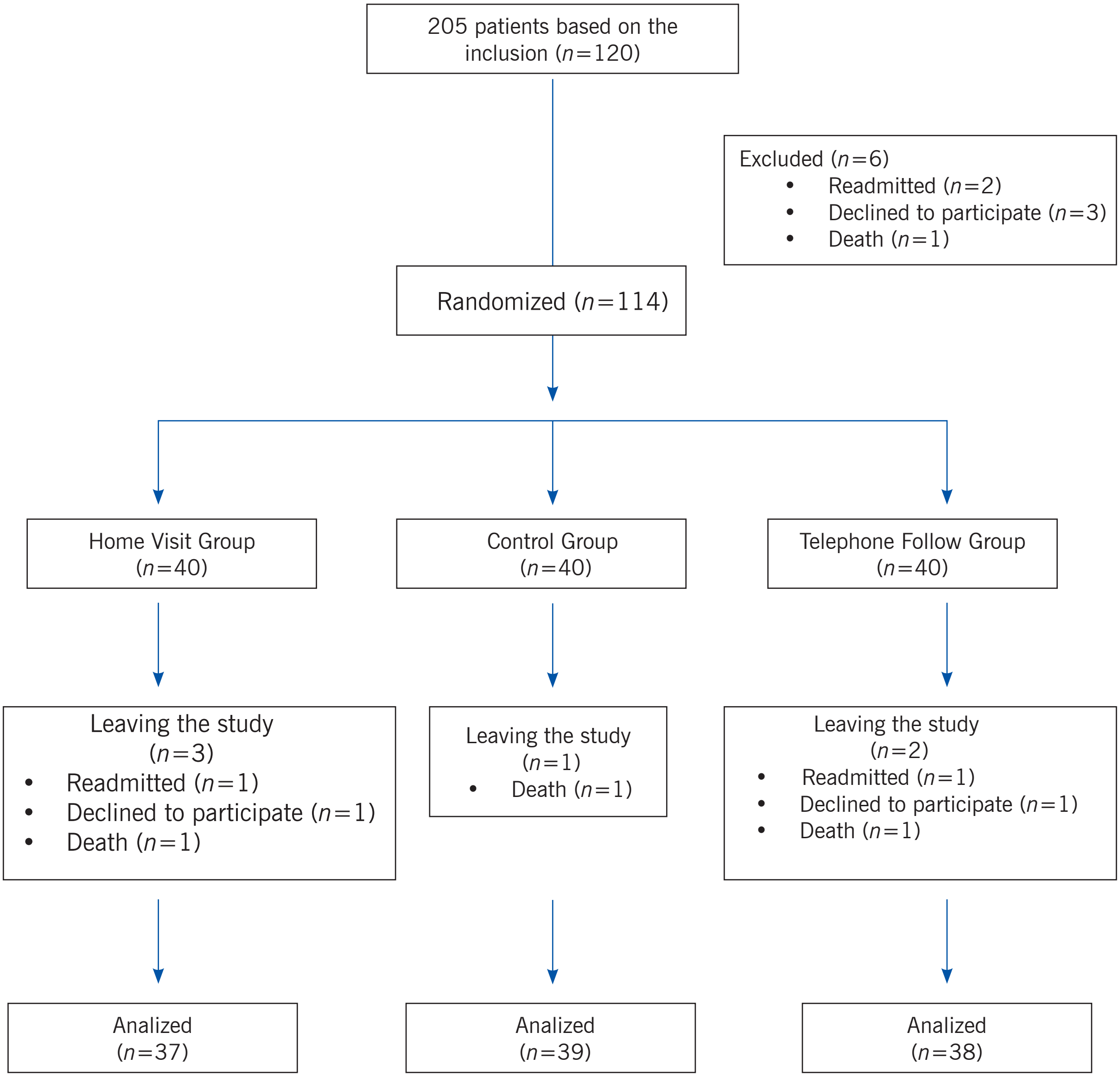


Figure 1. Classification, allocation, and analysis of participant data

The Home Visit Group. The self-management program was conducted for the home visit group with a nurse visiting the patient at home and assessing his/her information needs about self-management programs and by offering face-to-face training to the patient with the participation of the home caregiver for four weeks (one session a week, four sessions in all), each session lasting for about one hour. In the first week of the intervention, general information about taking medications, wound care, types of allowed activity, exercise and taking slow walks, active and passive exercises, diet, individual health, respiratory exercises, and awareness of postoperative complications and symptoms was provided the patients.

The Telephone Follow-up Group. In the telephone follow-up group, telephone counseling was performed twice a week, in eight 30-minute sessions. The call times were selected with prior coordination with and consent of the patient and his/her family. The different dimensions of the intervention (learning materials and contents, goals) for this group were similar to the home visit group, except for the follow-up method. Thus, telephone counseling and oral explanations offered the telephone follow-up group training, but in the home visit group, the activities were carried out in the researcher's presence and under his supervision and training. In addition, booklets were provided to the patients and their families that illustrated how the exercises should be performed.

Training about staying active in both group: In the first and second weeks, patients' mobility started with limited and low-intensity exercises according to the patient's tolerance ranging from getting out of bed and walking to active exercises of the wrist, elbow, and ankle operated upon. In the third and fourth weeks, mobility training continued with active upper and lower limb exercises. First, stretching movements were taught in the form of slow rotational movements of the neck, shoulders, ankle movements within the range of motion of the joints, and then the exercises of the upper limbs were taught, for instance, raising the arms above the head and then lowering them. For knee exercise, the patient was instructed to sit on a chair and, in turn, press each leg's toes on the ground and then raise the leg so that the calf and the thigh forms a straight line and the toes are bent towards the abdomen to the extent that the calf muscles contract. Finally, aerobic exercises and jogging were recommended and performed. The patient and the caregiver were instructed to repeat all these exercises 5 to 6 times daily, and each move is repeated ten times in each exercise session.

The structure and content of the self-management program are shown in Table 1.

The Control Group. This group also included routine care, including patient education with the participation of a home caregiver on how to exercise at home, the administration of medications, personal health, changing wound dressings for follow-up visits, and diet according to the routine of the relevant medical center. A nurse provided the education orally and face-to-face with the hospital's educational booklet during the discharge process.

Research Instruments. The cardiac rehabilitation self-efficacy instrument developed by Jokar *et al*.(24) was administered on the first day and the last day of the fourth week after discharge. The first part of the instrument consisted of items about the demographic characteristics of the patients, including age, gender, marital status, education, place of residence, occupation, economic status, the reason for referral, the number of sessions attended, the prescribed medications, home address, and phone number. The second part comprised 55 items rated on a 5-point Likert scale from 0 = "I am not sure" to 4 = "I am completely certain." On this instrument, the possible scores range from 0 to 220, 0 indicating the minimum and 220 indicating the maximum cardiac rehabilitation self-efficacy score. Obtaining a score from 0 to 55, 56 to 110,

Table 1. The structure and contents of the self-management program

Groups	Sessions	Topics	Description of the Topics	Time (Minutes)
Home visits	1	General explanations on care, administration of medications, physical activity, and answering the raised questions	The nurse answered all questions and, ambiguities were resolved. General information about primary care, complications, and emergencies, referrals to the doctor, how to take the drugs, side effects, and precautions about drugs were presented orally and, if necessary, demonstrated in practice. Additionally, permitted physical activities were taught to the patients and caregivers.	60
	2	Respiratory care, physical mobility, rest and sleep, physical activity, and answering the questions	Breathing exercises, using a Spiro-Ball, the use of respiratory sprays, the time to get out of bed, the precautions that should be taken before and during getting out of bed, the amount of rest, shortness of breath and its care, and the allowed physical activities were demonstrated to the patients and caregivers in practice.	60
	3	Wound care, personal hygiene, physical activities, and answering the raised questions	How to change wound dressings, signs of wound infection, washing, and bathing, the time to remove the sutures, put on clothes, and clean and disinfect them were taught and demonstrated to the patients and caregivers.	60
	4	Nutrition, exercise, physical activities, and answering the questions	The proper diet, the number of meals, the time of meals, the proper amount of food to be taken, methods of exercising and proper times for it, and the recommended physical activities were taught and demonstrated to the patients and caregivers under monitoring a nurse.	60
Telephone follow-up	1	General information about types of care, physical activities, Answering the questions raised by patients and caregivers.	All the questions raised by patients were answered, and general information on primary care, emergencies, visits to doctors, and the permitted physical activities were taught to the patients and caregivers by phone.	30
	2	have taken medications, physical activity, and answered the questions.	Taking the medications, and giving information about drug side effects, appropriate care, precautions, and the permitted physical activities were explained by phone to the patients and caregivers.	30
	3	Respiratory care, teaching physical activities, and answering the questions.	Breathing exercises and the use of Spiro-Ball, shortness of breath, the appropriate care, the methods of using respiratory sprays, and the allowed physical activities were discussed on the phone with patients and caregivers.	30
	4	Staying active, resting, sleeping, doing physical activities, and answering the questions.	Teach patients how and when to get out of bed, the precautions that should be taken before and during getting out of bed, the amount of rest needed, and the permitted physical activities on the phone.	30
	5	Wound care and answering the questions.	Patients and caregivers were taught how to change wound dressings, the signs of wound infection, and remove the sutures by phone.	30
	6	Nutrition and answering questions.	Patients and caregivers were taught about the proper diet, the number of meals, the time of having the meals by phone.	30
	7	Personal hygiene Answering the questions.	Patients and caregivers were taught about washing, bathing, putting on clothes, and cleanliness by phone.	30
	8	Physical exercise and answering questions.	The patients and caregivers were taught different types of physical exercise and the permitted times and amounts.	30

111 to 165, 166 to 220 indicated low, moderate, good, and very good cardiac rehabilitation self-efficacy, respectively. The targeting instrument was locally designed and psychometrically evaluated based on proper principles. Internal consistency was used to test and confirm the instrument's reliability with a Cronbach's alpha of 0.92. The instrument's validity was verified by confirmatory and exploratory factor analysis.(9)

Novak and Guest's caregiver burden inventory (CBI) consisted of two parts, completed by patients' main caregivers. The first part collects the demographic information. The second part comprises 24 items with five subscales: time-dependent caregiver burden, developmental caregiver burden, physical caregiver burden, social caregiver burden, and emotional caregiver burden. Caregivers' answers were indicated on a 5-point Likert scale from "completely incorrect" to "completely correct." The participants are expected to select one of these options in answering the questions: 1 = "completely incorrect", 2 = "incorrect", 3 = "partly correct", 4 = "correct", 5 = "completely correct". The scores for the whole scale range from 24 to 120. Scores from 24 to 39 indicate mild caregiver burden, 40 to 71 suggest moderate caregiver burden, and 72 t0 120 indicate intense care burden. The reliability and validity of this instrument are acceptable. The opinions of several experts to validate the instrument were sought. The reliability was confirmed with Cronbach's alphas of 69-87 for the subscales and 80 for the whole scale.(25)

The demographic information was collected by interviewing the patients and caregivers and referring to their clinical medical records. CBI was first completed for all groups on the first day after discharge. In the home visits group, the instrument was completed by patients and caregivers at their homes during the last session. In the other two groups, CBI was completed on the last day of the fourth week after discharge in person by a researcher who visited their homes. Additionally, all the topics were taught theoretically and practically to patients and caregivers of these groups during this last home visit. Both the home visits group and the follow-up calls group members were assured that the researcher would answer any questions they might have during the study course, and the control group members were assured that they would receive the routine care offered by the relevant center.

Statistical Analysis. Statistical data analysis was performed by the descriptive statistical tests of mean and standard deviation and the analytical statistical tests of chi-square, variance analysis, and covariance analysis. The chi-squared test was used to compare the demographic information and the qualitative data of the groups. Analysis of variance was used to evaluate and compare quantitative demographic and clinical information and compare the groups' self-efficacy scores before the intervention. Analysis of covariance was utilized to compare the self-efficacy scores of the groups after adjusting for the effects of confounding variables. The significance level was set at 0.05.

Ethical Considerations. Before starting the study, ethical approval of the Vice Chancellorship for Research and Technology of the Lorestan University of Medical Sciences (ethics code: LUMS.REC.1397.027). This study was conducted under the Declaration of Helsinki. The study's objectives were explained to the patients, and informed consent was obtained from them for participation in the study without any form of compulsion. Moreover, all topics taught to the intervention groups were also taught to the control group in the last session. The trial registration number was IRCT20100609004129N2.

Results

114 patients with an average age of 60.43±6.17 were enrolled in the study. Most participants were male (65.79%), married (92%), illiterate

(55.3%), and urban residents (79.82%). No significant differences were observed among the three groups regarding demographic and clinical characteristics, including age, gender, occupation, residence, the number of grafts, chronic diseases, smoking, and sleep disorders (Table 2).

Table 2. Comparing the demographic information of the three groups of CABG surgery patients

Group		Home visits	Follow-up calls	Control	*p*-value
Variable		*n*=38 *n* (%)	*n*=39 *n* (%)	*n*=37 *n* (%)	
Gender	Male	23 (62.2%)	29 (74.7%)	23 (60.5%)	0.378
	Female	14 (37.8%)	109 (25.6%)	15 (39.5%)	
Marital Status	Married	35 (94.6%)	35 (89.7%)	35 (92.1%)	0.418
	Single	2 (5.4%)	4 (10.3%)	3 (7.9%)	
Place of residence	Urban areas	33 (89.2%)	28 (71.8%)	30 (78.9%)	0.325
	Rural areas	4 (10.8%)	11 (28.2%)	8 (21.1%)	
Education	Illiterate	22 (59.5%)	16 (41%)	25 (65.8%)	0.270
	Junior high	3 (8.1%)	12 (30.8%)	5 (13.2%)	
	High school	3 (8.1%)	2 (5.1%)	2 (5.3%)	
	High school diploma	5 (13.5%)	6 (15.4%)	4 (10.5%)	
	University	4 (10.8%)	3 (7.7%)	2 (5.3%)	
Number of children	0 to 3	11 (29.7%)	13 (33.3%)	10 (26.3%)	0.978
	4 to 6	21 (58.8%)	14 (35.9%)	13 (34.2%)	
	More than 6	5 (13.5%)	12 (30.8%)	15 (39.5%)	
The number of bypass grafts	3	10 (27%)	7 (17.9%)	9 (23.7%)	0.495
	4	22 (59.5%)	29 (74.4%)	22 (57.9%)	
	5	5 (13.5%)	3 (7.7%)	7 (18.4%)	
Does the patient suffer from a sleep disorder?	Yes	9 (24.3%)	7 (17.9%)	10 (26.3%)	0.657
	No	28 (75.7%)	32 (82.1%)	28 (73.7%)	
Cardiac ejection fraction	Normal	24 (64.9%)	21 (53.8%)	21 (55.3%)	0.575
	Abnormal	13 (35.1%)	18 (46.2%)	17 (44.7%)	
Is the patient a smoker?	Yes	20 (51.4%)	22 (56.4%)	22 (57.9%)	0.945
	No	17 (49.5%)	17 (43.6%)	16 (42.1%)	
Does the patient have a history of blood pressure?	Yes	35 (94.6%)	34 (87.2%)	37 (97.4%)	0.0194
	No	2 (5.4%)	5 (12.8%)	1 (2.6%)	
Does the patient have a history of thyroid disorders?	Yes	2 (5.4%)	1 (2.6%)	295.3%)	0.791
	No	35 (94.6%)	38 (97.4%)	36 (94.7%)	
Does the patient have a history of digestive disorders?	Yes	6 (16.2%)	4 (10.3%)	5 (13.2%)	0.744
	No	31 (83.8%)	35 (89.7%)	33 (86.8%)	
Does the patient have a history of diabetes?	Yes	9 (24.3%)	14 (35.9%)	13 (34.2%)	0.507
	No	28 (75.7%)	25 (64.1%)	25 (65.8%)	
Does the patient have a history of musculoskeletal disorders?	Yes	1 (2.7%)	1 (2.6%)	0 (0%)	0.601
	No	36 (97.3%)	38 (97.4%)	38 (100%)	
Does the patient have a history of dyslipidemia?	Yes	4 (10.8%)	10 (25.6%)	8 (21.1%)	0.247
	No	33 (89.2%)	29 (74.4%)	30 (78.9%)	
Does the patient have a history of COPD?	Yes	29 (78.4%)	29 (74.4%)	32 (84.2%)	0.567
	No	8 (21.6%)	10 (25.6%)	6 (15.8%)	
Does the patient have a history of CVA?	Yes	34 (91.9%)	34 (87.2%)	35 (92.1%)	0.710
	No	3 (8.1%)	5 (12.8%)	3 (7.9%)	
Does the patient have a family history of CVD?	Yes	14 (937.8%)	18 (46.2%)	12 (31.6%0	0.419
	No	23 (62.2%)	21 (53.8%)	23 (68.4%)	

Based on a one-way analysis of variance, the three groups were not significantly different before the intervention in terms of self-efficacy ($p = 0.960$). However, the results of covariance analysis showed significant differences among the groups after the intervention ($p = 0.001$), such that the mean self-efficacy scores in the home visits and follow-up calls groups were higher than the control group ($p = 0.001$). However, there were no significant differences between the home visits and follow-up calls groups after the intervention ($p = 0.477$) (Table 3). Bonferroni's posthoc test showed significant differences in self-efficacy scores between the home visits and control groups ($p = 0.001$) and the follow-up calls and control groups ($p = 0.001$) after the intervention.

Considering Table 4 and the results of the chi-squared test, there were no significant differences among the three groups in terms of the demographic variables of gender ($p = 0.794$), marital status ($p = 0.652$), education ($p = 0.497$), occupational class ($p = 0.302$), and the relationship between the patient and the caregiver ($p = 0.531$). According to Table 5, the caregiver burden was significantly different in the three groups after the intervention ($p = 0.001$). Bonferroni's posthoc test showed that the caregiver burden was significantly different in the home visits and control groups ($p = 0.001$), as well as in the follow-up calls and control groups ($p = 0.001$) after the intervention, such that the mean caregiver burden scores were less than in the control group. However, no significant difference was found between the home visits' and follow-up calls groups ($p = 0.801$). Analysis of covariance was used to evaluate the differences among the three groups after the intervention (Table 5).

Table 3. The mean self-efficacy score of CABG patients and their significance level in groups before and after the intervention

Groups		Mean (SD)	F*	df	*p*-value
Before	Home visits	131.40 (22.82)	0.041*	2	0.960
	Follow-up calls	132.94 (31.03)			
	Control	131.43 (26.56)			
After	Home visits	175.81 (24.723)	19.73**	2	0.001
	Follow-up calls	179.79 (30.61)			
	Control	147.37 (31.44)			

* One-way analysis of variance, ** analysis of covariance

Table 4. The frequency of the demographic characteristics of caregivers

Variable	Group	Home visits	Follow-up calls	Control	*p*-value
		n=38	*n*=39	*n*=37	
		n (%)	*n* (%)	*n* (%)	
Gender	Male	6 (16.2%)	5 (12.8%)	7 (18.4%)	0.794
	Female	31 (83.8%)	34 (87.2%)	31 (81.6%)	
Marital status	Married	10 (27%)	12 (30.8%)	13 (34.2%)	0.652
	Single	27 (73%)	27 (69.2%)	25 (65.8%)	
Education	Illiterate	1 (2.7%)	4 (10.2%)	1 (2.6%)	0.497
	Junior high	3 (8.2%)	6 (15.4%)	8 (21.1%)	
	High school	7 (18.9%)	5 (12.8%)	4 (10.5%)	
	High school diploma	17 (45.9%)	18 (46.2%)	15 (39.5%)	
	University	9 (24.3%0	6 (15.4%)	10 (26.3%)	
Job classification	Student	0 (0%)	0 (0%)	2 (5.3%)	0.302
	White collar employee	0 (0%)	3 (7.7%)	3 (7.9%)	
	Self-employed	6 (16.2%0	5 (12.8%)	9 (23.7%)	
	Housewife	25 (67.6%)	25 (64.1%)	20 (52.6%)	
	Other	6 (16.2%0	6 (15.4%)	4 (10.5%)	
Caregiver and patient relationship	Spouse	12 (32.4%)	15 (35.8%)	9 (23.7%)	0.531
	Daughter	21 (56.8%)	19 (48.7%)	22 (57.9%)	
	Son	4 (10.8%)	4 (10.3%)	7 (18.4%)	
	Mother	0 (0%)	1 (2.5%)	0 (0%)	

Table 5. The comparison of the caregiver burden of the three groups before and after the intervention

Groups	Mean (SD) of caregiver burden	F	df	*p*-value
Before				
Home visits	(13.50) 58.83	0.229*	2	0.796
Telephone follow-up	(16.53) 60.64			
Control	(11.39) 60.81			
After				
Home visits	(8.04) 34.10	21.96**	2	0.001
Telephone follow-up	(8.836) 34.58			
Control	(14.03) 48.23			

* One-way analysis of variance; * Analysis of covariance.

Discussion

The present study's findings indicated that the self-efficacy of CABG surgery patients increased in the home visits and follow-up calls groups after the designed intervention was implemented compared to the control group in which the scores remained the same. In addition, the caregiver burden decreased in these groups after the one-month intervention was executed. In line with the present study, other studies have also shown that homecare for cardiac patients can improve self-efficacy and the quality of life (Qol).(7,8,26) Enhancing self-efficacy can improve self-care activities and health-related behaviors(27) and effectively reduce postoperative complications. In this study, the services were provided by a nurse with expertise in cardiac surgery patients. However, a health team should provide the required services.(17) Studies have also shown that providing services to cardiovascular patients by a multidisciplinary team under the guidance of nurses, physicians, nutritionists, and physiotherapists has led to improvements in self-management behaviors and self-efficacy.(14)

The present study demonstrated that telephone-based educational interventions could promote self-efficacy. Consistent with the present study, the findings of another study indicate that persistent follow-up sessions carried out in absentia or remotely involving an educational program with a duration of 3 months and presenting educational content via text messages and telephone calls can lead to increases in self-efficacy the patients.(6) Additionally, long-distance healthcare (telehealth) can increase QoL and decrease depression, anxiety, and suicide rates.(28) One study has shown that a one-unit increase in health-related behaviors and heart-related knowledge can raise self-efficacy in managing the prevention of cardiovascular diseases by 0.432 and 0.475 units, respectively.(29)

In the current study, communication with the patients and caregivers was conducted only by phone, whereas another study demonstrated that video calls might improve patients' conditions after discharge.(20) However, another study suggested that implementing educational interventions using various media is more effective in enhancing patients' self-efficacy than using telephones alone.(30) Another study, aiming to examine the effect of patients' adherence to care programs, in which CABG patients had participated for four weeks and had been educated by video conferencing, showed that patients who had received services by telenursing were more successful in adhering to the treatment program than the control group.(20) Accordingly, it seems that using the potentials of social messaging apps may be more effective than phone calls. Therefore, it is recommended that a study be conducted on the impact of various methods of communication that might be used in telenursing in remote follow-up programs carried out in absentia. Nonetheless, another study has shown that this type of intervention is not financially cost-effective, the reason being the costs of digital instruments for hemodynamic indicators and weighing patients in absentia and the transfer of information via landlines.(31) The findings of this study showed that follow-up calls could eliminate distance and facilitate educating patients and caregivers.

Similar studies confirm that implementing self-management programs via various means and media can improve patients' self-efficacy. A study demonstrated that group education, home visits to offer counsel, and follow-up calls could improve patients' QoL and decrease postoperative problems. In this study, patients benefited both from home visits and follow-up calls. Considering the effectiveness of both rehabilitation methods, the simultaneous use of both methods can have a potentiating effect and the subsequent positive effects of rehabilitation.(26) Therefore, given the effectiveness of both methods and the cost-effectiveness of telephone counseling, and also because of lack of time and distance constraints, the lack of need to take trips and incur additional costs, the use of this method is recommended, especially in the clinical context of Iran, because answering patients' questions regarding lifestyle choices and other issues related to patient rehabilitation by telenursing, as a system for offering health services to patients after surgery and discharge, can be beneficial in improving adherence to the treatment plan and improving QoL.

Moreover, the present study's findings indicated that caregiver burden decreased in the home visits and follow-up calls groups, which is in line with a study by Nosratabadi *et al*.(22) Li Chi *et al*.(3) conducted a study aiming to reduce the family member caregiver burden of patients suffering from heart failure by phone demonstrated that intervention group caregivers improved in stress management and performance compared to the control group. Cardiovascular diseases accompany patients throughout their lives and affect other family members, too. Therefore, empowering the family to manage the disease better and enjoy life is essential.(32) In this regard, the findings of a study showed that even secondary caregivers suffer from physical and psychological problems during the provision of care services and need to be supported.(33) Although the challenges and problems that family caregivers face decrease over time due to gaining experience,(34) conducting patient-oriented interventions, including educational interventions, as in the present study, are essential in reducing the care burden of family caregivers.(23)

One of the limitations of this study was that it was conducted in a short period. On the other hand, multidisciplinary teams should make home visits and improve by inter-professional cooperation. In the present study, a team did not provide the services because of limitations. Hence, it is recommended that further studies be conducted on providing community-based services to patients after open-heart surgeries with more extended follow-up periods and team services. Another limitation of the study was the short duration of the educational intervention and the counseling offered to patients and their families.

Conclusion. Based on the findings that showed both the home visits and the follow-up calls methods are effective, and there are no differences between them in results, it is suggested that both methods be used in order to improve the quality of health and treatment services after patients are discharged, such that home visits are made during the first days after discharge and then considering the condition of the patient and the family, follow-up calls are used subsequently. Furthermore, it is recommended that further studies be conducted on the impact of these methods on patients' QoL, patient and family satisfaction, and also their cost-effectiveness of these methods at the community level.

References

1. Dalirirad H, Ghezeljeh T. THE Effects of educational support on anxiety in family caregivers of patients undergoing coronary artery bypass graft surgery. Nurs. Midwifery J. 2019;16(10):738-48.
2. Bravo-Escobar R, González-Represas A, Gómez-González AM, Montiel-Trujillo A, Aguilar-Jimenez R, Carrasco-Ruíz R, et al. Effectiveness and safety of a home-based cardiac rehabilitation programme of mixed surveillance in patients with ischemic heart disease at moderate cardiovascular risk: A randomised, controlled clinical trial. BMC Cardiovasc. Disord. 2017;17(1):66.
3. Chiang L-C, Chen W-C, Dai Y-T, Ho Y-L. The effectiveness of telehealthcare on caregiver burden, mastery of stress, and family function among family caregivers of heart failure patients: a quasi-experimental study. Int. J. Nurs. Stud. 2012; 49(10):1230-42.
4. Greco A, Steca P, Pozzi R, Monzani D, Malfatto G, Parati G. The influence of illness severity on health satisfaction in patients with cardiovascular disease: The mediating role of illness perception and self-efficacy beliefs. Behav. Med. 2015; 41(1):9-17.

5. Dennis LMG. Multiplication, achievement and self-efficacy in third-and fifth-grade students: Effects of cross-age peer tutoring and skill training: The University of Arizona; 2013.
6. Boroumand S, Moeini M. The effect of a text message and telephone follow-up program on cardiac self-efficacy of patients with coronary artery disease: A randomized controlled trial. Iranian journal of nursing and midwifery research. The effect of a text message and telephone follow-up program on cardiac self-efficacy of patients with coronary artery dis-ease: A randomized controlled trial. Iran. J. Nurs. Midwifery Res. 2016;21(2):171-3.
7. Bazargani RH, Besharat MA, Ehsan B, Nejatian M, Hosseini K. The efficacy of chronic disease self management program and Tele-health on adherence by increasing self efficacy in patients with CABG. Procedia Soc. Behav. Sci. 2011; 30:817-21.
8. Poortaghi S, Baghernia A, Golzari SE, Safayian A, Atri SB. The effect of home-based cardiac rehabilitation program on self efficacy of patients referred to cardiac rehabilitation center. BMC Res. Notes. 2013; 6(1):287.
9. Mohammadi N, Abbasi M, Nasrabadi AN, Salehiomran A, Davaran S, Norouzadeh R. Passion for life: lived experiences of patients after coronary artery bypass graft. J. Tehran Univ. Heart Cent. 2015; 10(3):129-133.
10. Howarter AD, Bennett KK, Barber CE, Gessner SN, Clark JM. Exercise self-efficacy and symptoms of depression after cardiac rehabilitation: predicting changes over time using a piecewise growth curve analysis. J. Cardiovasc. Nurs. 2014; 29(2):168-77.
11. Halm MA, Treat-Jacobson D, Lindquist R, Savik K. Correlates of caregiver burden after coronary artery bypass surgery. Nurs. Res. 2006; 55(6):426-36.
12. Geng D, Ou R, Miao X, Zhao L, Wei Q, Chen X, et al. Patients' self-perceived burden, caregivers' burden and quality of life for amyotrophic lateral sclerosis patients: a cross-sectional study. J. Clin. Nurs. 2017; 26(19-20):3188-99.
13. Kang Y, Yang IS. Cardiac self-efficacy and its predictors in patients with coronary artery diseases. J. Clin. Nurs. 2013; 22(17-18):2465-73.
14. Jiang W, Zhang Y, Yan F, Liu H, Gao R. Effectiveness of a nurse-led multidisciplinary self-management program for patients with coronary heart disease in communities: A randomized controlled trial. Patient Educ. Couns. 2020; 103(4):854-63.
15. Solorzano CS, Steptoe A, Leigh E, Kidd T, Jahangiri M, Poole L. Pre-surgical caregiver burden and anxiety are associated with post-surgery cortisol over the day in caregivers of coronary artery bypass graft surgery patients. Int. J. Behav. Med. 2019; 26(3):316-22.
16. Jolly K, Sidhu M, Bates E, Majothi S, Sitch A, Bayliss S, et al. Systematic review of the effectiveness of community-based self-management interventions among primary care COPD patients. NPJ Prim. Care Respir. Med. 2018; 28(1):44.
17. Shahsavari H, Nasrabadi AN, Almasian M, Heydari H, Hazini A. Exploration of the administrative aspects of the delivery of home health care services: a qualitative study. Asia Pacific family medicine. 2018;17(1):1-7.
18. Nabagiez JP, Shariff MA, Molloy WJ, Demissie S, McGinn Jr JT. Cost analysis of physician assistant home visit program to reduce readmissions after cardiac surgery. Ann. Thora. Surg. 2016; 102(3):696-702.
19. Heidari M, Sarvandian S, Moradbeigi K, Akbari Nassaji N, Vafaizadeh M. Comparing the effect of telenursing and education without follow-up in the caregivers of heart failure patients on the self-care behavior and clinical status of heart failure patients. Hayat J. 2017; 23(1):44-58.
20. Bikmoradi A, Masmouei B, Ghomeisi M, Roshanaei G. Impact of Tele-nursing on adherence to treatment plan in discharged patients after coronary artery bypass graft surgery: A quasi-experimental study in Iran. Int. J. Med. Inform. 2016; 86:43-48.
21. Thomas RJ, Beatty AL, Beckie TM, Brewer LC, Brown TM, Forman DE, et al. Home-based cardiac rehabilitation: a scientific statement from the American Association of Cardiovascular and Pulmonary Rehabilitation, the American Heart Association, and the American College of Cardiology. Circ. 2019; 140(1): e69-e89.
22. NasrAbadi T, Sharafi S, FallahTafti B, Vaezi A, Heidari M. Investigating the effect of continuous care model on the social health status of family caregivers in hospitalized patients undergoing coronary artery bypass graft surgery. SSU J. 2016; 24(6):513-23.
23. Moieni M, Poorpooneh Z, Pahlavanzadeh S. Investigating the effect of family-focused nursing intervention on caregiver burden of the family members of the patients undergoing coronary bypass surgery in Isfahan Shahid Chamran Hospital during 2012. Iran. J. Nurs. Midwifery Res. 2014;19(2):187.

24. Jokar F, Yousefi H, Yousefy A, Sadeghi M. Behavioral change challenges in the context of center-based cardiac rehabilitation: A qualitative study. Iran. Red Crescent Med. J. 2015;17(6): e27504.
25. Salmani N, Ashketorab T, Hasanvand S. The burden of Caregiverand related Factorsof oncology. Adv. Nurs. Midwifery. 2014; 24(84):11-8.
26. Akbari M, Celik SS. The effects of discharge training and postdischarge counseling on quality of life after coronary artery bypass graft surgery. Iran. J. Nurs. Midwifery Res. 2015; 20(4):442-9.
27. O'Neil A, Berk M, Davis J, Stafford L. Cardiac-self efficacy predicts adverse outcomes in coronary artery disease (CAD) patients. Sci. Res. 2013; 5(7):6-14.
28. Koh KWL, Wang W, Richards AM, Chan MY, Cheng KKF. Effectiveness of advanced practice nurse‐led telehealth on readmissions and health-related outcomes among patients with post-acute myocardial infarction: ALTRA Study Protocol. J. Adv. Nurs. 2016; 72(6):1357-17.
29. Shrestha R, Rawal L, Bajracharya R, Ghimire A. Predictors of cardiac self-efficacy among patients diagnosed with coronary artery disease in tertiary hospitals in Nepal. J. Public Health Res. 2020;9(4):1787.
30. Mohebbi H, Mazlom SR, Kasraei MR, Hamedi Z, Hosseinikhah H, Dehghan Moghimi H, et al. Comparison of the effects of media-based and face-to-face cardiac rehabilitation training programs on self-efficacy in patients undergoing coronary artery bypass grafting. Evid. Based Care. 2018; 8(2):67-77.
31. Kidholm K, Rasmussen MK, Andreasen JJ, Hansen J, Nielsen G, Spindler H, et al. Cost-utility analysis of a cardiac telerehabilitation program: the teledialog project. Telemed. e-Health. 2016; 22(7):553-63.
32. Sanaie N, Nejati S, Zolfaghari M, Alhani F, KazemNejad A. The effect of family-centered empowerment in self efficacy and self esteem in patients undergoing coronary bypass graft surgery. J. Res. Develop. Nurs. Midwifery. 2013; 10(2):44-53.
33. Bjørnnes AK, Moons P, Parry M, Halvorsen S, Tønnessen T, Lie I. Experiences of informal caregivers after cardiac surgery: a systematic integrated review of qualitative and quantitative studies. BMJ Open. 2019; 9(11): e032751.
34. Yates BC, Park EO, Hug A, Kupzyk KA, Skradski SK. Changes over time in caregiving demand and difficulty in spousal caregivers of coronary artery bypass graft surgery patients. Appl. Nurs. Re. 2018; 39:1-3.

Original article

Development and semantic validation of an instrument for the assessment of knowledge and attitudes towards cardiopulmonary resuscitation in adolescents

Yrene Esperanza Urbina Rojas[1,7]
https://orcid.org/0000-0001-6834-6284
Zoila Esperanza Leiton-Espinoza[2,8]
https://orcid.org/0000-0001-5040-7042
Angel López-González[3,9]
https://orcid.org/0000-0002-1135-5590
Joseba Rabanales-Sotos[4,9]
https://orcid.org/0000-0002-6649-4395
Alice Regina Felipe Silva[5,10]
https://orcid.org/0000-0001-7363-9954
Jack Roberto Silva Fhon[6,10]
https://orcid.org/0000-0002-1880-4379

Development and semantic validation of an instrument for the assessment of knowledge and attitudes towards cardiopulmonary resuscitation in adolescents

Abstract

Objective. Develop and semantically validate an instrument to assess the knowledge and attitudes of adolescents towards cardiopulmonary resuscitation (CPR)..**Methods.** Validation study of an instrument to evaluate the knowledge and attitudes of adolescents towards CPR, developed in three phases: (i) development of the evaluation instruments by the authors; (ii) content validation performed by 14 expert judges in the area using the content validity index for analysis; and (iii) semantic validation carried out with the participation of 30 adolescents between 11 and 13 years old. **Results.** In the content validation, the questions on CPR knowledge obtained a content validity index (CVI) between 0.92 and 1.00, with a general index of 0.98; and the questions

1 Nurse, Doctor.
Email: yurbina@untumbres.edu.pe.
Autor de correspondencia
2 Nurse, Doctor. Email: zeleiton@unitru.edu.pe
3 Male Nurse, Doctor. Email: angel.lopez@uclm.es
4 Male Nurse, Doctor.
Emaill: joseba.rabanales@uclm.es
5 Nurse, Mastering.
Email: alice.regina.silva@alumni.usp.br
6 Male Nurse. Email: betofhon@usp.br
7 Nursing College, Universidad Nacional de Tumbes. Perú
8 Nursing College,Universidad Nacional de Trujillo. Perú
9 Nursing College, Albacete, Universidad de Castilla-La Mancha. España
10 Nursing College, Universidad de Sao Paulo. Brasil

Conflicts of interest: None.

Receive: June 29, 2021.

Approved: March 3, 2022.

How to cite this article: Urbina YE, Leiton ZE, López-González A, Rabanales-Sotos J, Silva ARF, Fhon JRS. Development and semantic validation of an instrument for the assessment of knowledge and attitudes towards cardiopulmonary resuscitation in adolescents. Invest. Educ. Enferm. 2022; 40(1):e15.

DOI: https://doi.org/10.17533/udea.iee.v40n1e15.

about attitudes obtained an IVC between 0.85 and 1.00, with a general index also of 0.98. Regarding semantic validation, three questions were modified in the knowledge assessment instruments and five in the attitude assessment instrument. **Conclusion.** Semantic and content validation of the instruments studied showed that they are suitable for assessing the knowledge and attitudes of adolescents related to CPR, so their use is recommended in the evaluation of training actions in this population group.

Descriptors: validation study; cardiopulmonary resuscitation; health knowledge, attitudes and practice; adolescent; nursing methodology research.

Desarrollo y validación semántica de un instrumento para la evaluación en adolescentes de los conocimientos y actitudes hacia la Resucitación cardiopulmonar

Resumen

Objetivo. Desarrollar y validar semánticamente un instrumento para evaluar los conocimientos y las actitudes de adolescentes hacia la resucitación cardiopulmonar (RCP). **Métodos.** Estudio de validación de un instrumento para evaluar los conocimientos y las actitudes de adolescentes hacia la RCP que se desarrolló en tres fases: (i) desarrollo de los instrumentos de evaluación por parte de los autores; (ii) validación de contenido realizada por 14 jueces expertos en el área utilizando el índice de validez de contenido para el análisis; y (iii) validación semántica realizada con la participación de 30 adolescentes, entre los 11 y 13 años. **Resultados.** En la validación de contenido, las preguntas sobre conocimientos de RCP obtuvieron un índice de validez de contenido (IVC) entre 0.92 y 1.00, con índice general de 0.98; y las preguntas sobre actitudes obtuvieron un IVC entre 0.85 a 1.00, con un índice general también de 0.98. En cuanto a la validación semántica, se modificaron tres preguntas en los instrumentos de evaluación de conocimientos y cinco en el instrumento de evaluación de actitudes. **Conclusión.** La validación semántica y de contenido de los instrumentos estudiados mostraron que son adecuados para la valoración de conocimientos y actitudes de los adolescentes relacionados con la RCP, por lo que se recomienda su uso en la evaluación de acciones formativas en este grupo poblacional.

Descriptores: estudio de validación; reanimación cardiopulmonar; conocimiento, actitudes y prácticas en salud; adolescente; investigación metodológica en enfermería.

Desenvolvimento e validação semântica de um instrumento para a avaliação em adolescentes dos conhecimentos e atitudes para a Ressuscitação cardiopulmonar

Resumo

Objetivo. Desenvolver e validar semanticamente um instrumento para avaliar os conhecimentos e as atitudes de adolescentes para a ressuscitação cardiopulmonar (RCP). **Métodos.** Estudo de validação de um instrumento para avaliar os conhecimentos e as atitudes de adolescentes para a RCP que se desenvolveu em três fases: (i) desenvolvimento dos instrumentos de avaliação por parte dos autores; (ii) validação de conteúdo realizada por 14 juízes especialistas na área utilizando o índice de validez de conteúdo para a análise; e (iii) validação semântica realizada com a participação de 30 adolescentes de entre 11 e 13 anos. **Resultados.** Na validação de conteúdo, as perguntas sobre conhecimentos de RCP obtiveram um índice de validez de conteúdo (IVC) entre 0.92 e 1.00, com índice geral de 0.98; e as perguntas sobre atitudes obtiveram um IVC entre 0.85 a 1.00, com um índice geral também de 0.98. Enquanto à validação semântica, se modificaram três perguntas nos instrumentos de avaliação de conhecimentos e cinco no instrumento de avaliação de atitudes. **Conclusão.** A validação semântica e de conteúdo dos instrumentos estudados mostraram que são adequados para a valoração de conhecimentos e atitudes dos adolescentes relacionados com a RCP, por isso se recomenda seu uso na avaliação de ações formativas neste grupo populacional.

Descritores: estudo de validação; reanimação cardiopulmonar; conhecimentos, atitudes e prática em saúde; adolecente; pesquisa metodológica em enfermagem.

Introduction

Out-of-hospital cardiac arrest is the third leading cause of death in the world, it represents one of the main global health problems, constituting a public health problem.(1) Published data indicate that the annual incidence of out-of-hospital cardiac arrest in the European countries ranges from 67 to 170 per 100,000 population, with European citizens initiating resuscitation in 58% of cases.(2) Immediate initiation of cardiopulmonary resuscitation (CPR) by a citizen improves survival from cardiac arrest out-of-hospital and it is estimated that the chances of survival can be doubled or tripled. Therefore, designing strategies to teach CPR will increase the individual's chances of survival.(3)

The World Health Organization endorsed the Kids Save Lives statement, recognizing that teaching CPR to children and adolescents is an effective way to increase care for people experiencing out-of-hospital cardiac arrest. This learning, moreover, has a multiplier effect, which supports its inclusion in the school curriculum.(4) The International Liaison Committee on Resuscitation recommends teaching CPR from children and having evaluation instruments that allow estimating perceived self-efficacy or judgments of each individual on their abilities.(5) The school environment is ideal for promoting knowledge and learning basic CPR techniques. It is known that children under 13 years of age have difficulties in performing some of the basic resuscitation techniques due to their physical characteristics, however, they are able to learn and remember these and other theoretical aspects related to the initial care provided to patients in cardiac arrest. (CA), promoting knowledge and skills step by step, according to age and stage of training. (6) There are various programs, methods and teaching materials proposed for teaching CPR from an early age. It has been observed that children and adolescents are capable of assimilating the knowledge and skills necessary to perform CPR. Also, they are able to transmit them among their own family and friends. However, the best training method for each population group has yet to be defined. (3,7)

In CPR training, the instruments for the evaluation of knowledge acquired by the participants must be validated in terms of content, appearance, criteria and construct, to be reliable.(8) The evaluation of the content of an instrument is considered a fundamental step in this design. It represents a beginning in the association mechanisms of abstract concepts as indicators that can be observed and measured.(9)

Semantic validation indicates whether it is well constructed from the communicative point of view, that is, it adequately shows its intention and purpose.(10) One of the greatest challenges in the development of assessment instruments aimed at children and adolescents involves the need of the specialized use of words and syntactic structures, common in the academic field, but foreign to them. (11) Mistakes in the decoding of information make difficult for children and adolescents to read comprehension,(12) so in this sense, semantic validation will allow a readjustment of terms so that adolescents understand the questions in their entire context.

Attitudes refer to people's perceptions of their ability to perform certain tasks.(13) They allow determining aspects of fear and anxiety to face new and/or stressful situations. Attitudes involve motivation and cognitive resources, and the actions needed to achieve certain goals are more likely to occur when high self-efficacy is perceived.(8) There are different models and instruments that measure the knowledge and emotional response in health sciences professionals and students to CPR training, (8,14,15) but there are no validated scales that assess whether the adolescent population feels capable of use their knowledge and skills in a PC situation after a CPR training process. In this sense, the objective of the present study was to construct and semantically validate instruments to evaluate the knowledge and attitudes of adolescents related to basic CPR.

Methods

This is a methodological study that is part of the research entitled "Basic cardiopulmonary resuscitation training project in children and adolescents of a public educational institution. Tumbes, Peru, 2019". This phase of the study was carried out in three stages: (a) development of the evaluation instruments; (b) content validation by expert judges; and (c) semantic validation by the target population.

The ad hoc instrument to assess CPR knowledge was created based on the 2020 Basic CPR Guidelines and Protocols of the American Heart Association (AHA) and the 2021 European Resuscitation Council (ERC).(16,17) The questions evaluated only those techniques that are considered safe to perform in the current pandemic environment following the CPR Guidelines in a pandemic situation. (18) It was made up of eight questions with four answer options, of which only one was correct, and the participants could choose one of the options. The CPR attitude assessment instrument is made up of 11 questions with dichotomous answers (yes and no) and aims to identify the attitudes of adolescents in relation to the care they would offer to a CA. The items of this instrument are based on what was proposed by Navalpotro and Torre. (14)

Content validation was used in the study in order to determine the representativeness of the items of the proposed instruments. The judgment of specialists in the area was available,(19) which allowed for an effective exploration of the requirements to measure the phenomenon under investigation. A committee of expert judges in the area of basic CPR was formed. Fifteen specialists were invited, chosen for convenience due to their professional experience and postgraduate studies in the area of urgencies and emergencies. Of those invited, 14 agreed to participate in the research. The instruments were sent by e-mail and they were given a period of 15 days to return them with their suggestions. (13)

The content validity index (CVI) was used to analyze the responses of the judges. This index allows to analyze the instruments as a whole, and each item individually using a Likert-type scale from 1 to 4. Its purpose was to measure the proportion of specialists who agreed with the content presented. (13) The study met the number minimum number of specialists recommended by the literature. (17) In addition, values of at least 0.78 were considered for the validity of each item of the instruments, and of at least 0.90 for the validity of the instruments as a whole.(8,19)

The semantic validation was carried out through interviews with a structured instrument to 30 adolescents of both sexes, between January and February 2021. A convenience sample was used, and the inclusion criteria were that the adolescents had to be between 11 and 13 years old, age considered by the WHO as early adolescence, and similar to that of the students in which the instruments will be applied and an adequate level of reading comprehension in Spanish. Three groups of 10 participants were formed for each age group (11, 12 and 13 years).

To collect this information, meetings were scheduled with adolescents, carried out through Google Meet® or in person by previously trained nurses, lasting 30 minutes. During the interview, the instrument was read to the adolescent to identify if he understood the wording of the question and the response options. When the participant reported that he did not understand or did not know the word or its meaning, he was asked to say what he understood and synonyms were dictated that could replace the unknown word.

This study respected the ethical principles of the Helsinki Convention. To participate in the study, the adolescents had to agree and present the signed authorization of their parents and/or guardians. The research project was approved by the Research Ethics Committee of the National University of Tumbes with number 001-2021/CEI-UNTUMBES.

Results

The committee of expert judges was made up of 13 nurses and one male nurse. The average age was 53 years, with an average time of professional practice of 27.2 years. Regarding degrees, 71.4% had a master's degree and 14.3% were specialists in emergency and intensive care, the remaining 14.3% were graduates in nursing without a specialty. Regarding workplaces, 50% worked in intensive care units, 50% in emergency services. In addition to their professional practice, 78.6% of the judges were professors in undergraduate, specialty and/or postgraduate programs at universities in Peru.

Regarding the content validity of the instrument to evaluate knowledge related to CPR, after the evaluation carried out by the experts, of the eight questions of the instrument, two of these obtained an CVI applied to questions (CVI-I) > 0.92, and six of them obtained a score of 1. (Table 1) The general CVI obtained a score of 0.98.

With respect to the instrument for assessing attitudes of adolescents towards a witnessed CA and CPR, two questions obtained an CVI-I >0.85, and nine of them obtained a score of 1. The overall CVI score was 0.98 (Table 2).

During the semantic validation, the suggestions of the participants generated modifications in some terms of the instruments proposed by the experts in order to improve understanding, keeping the focus on the evaluation of the knowledge and attitudes of adolescents during CPR. Regarding the modifications made in the knowledge evaluation instrument (Table 3), the answer "c" of question 1 was modified, substituting the word "absence" for "lack". Answer "d" to the same question was also changed, replacing the word "sudden." with "abrupt" The statement of question 3 was initially "What should I say when I call the Emergency Service, for example, the fire department 116?" was changed to What should I say when I call the Emergency number, for example the firefighters 116? Initially, the statement of question 5 was "If after performing the compressions in the center of the person's chest, I CHECK THAT THEY ARE BREATHING, what should I do?" and was replaced with "If after performing compressions in the center of the person's chest, I CONFIRM THEY ARE BREATHING, what should I do?"

In relation to the attitude evaluation instrument, questions one, four and five were modified as follows (Table 4): Question 1, initial statement "I feel able and I am prepared to react to an emergency situation", final statement, "I feel able and I am prepared to react to an emergency in which life is in danger"; Question 4, initial statement "I feel able of quickly calling an emergency system, for example, the fire department (116), when I find a person who has fainted and is NOT

Table 1. Content Validation Index of the instrument developed to assess knowledge about Basic Cardiopulmonary Resuscitation in adolescents, obtained through the evaluation of specialists. Peru, 2021

Questions	CVI-1
1 what is a heart arrest?	1
a) The heart stops beating and the person does not breathe.	
b) The heart slowly stops beating.	
c) Absence of breathing.	
d) Sudden loss of consciousness.	
2. What is the first step to be taken in front of a person with loss of consciousness?	1
a) Request help from the health service by calling 116*.	
b) Extend the neck backwards so that the air enters.	
c) Move the unconscious person to wake up.	
d) Be by the person's side until the ambulance arrives.	
3. What should I say when I telephone the emergency service, for example, the fire department 116?	1
a) I inform that the person does not respond, is not breathing and where I am.	
b) I shout reporting my data asking for help and hang up immediately.	
c) I ask another person to pass on the information about what is happening with the person.	
d) I scream and ask someone else to pass the information to the health personnel.	
4. While the ambulance arrives, how many compressions should I perform in the center of the person's chest?	1
a) 30 compressions per minute.	
b) 15 compressions per minute.	
c) 100-120 compressions per minute.	
d) Those necessary until the ambulance arrives	
5. If after doing the compressions in the center of the person's chest I CHECK HE (or SHE) IS BREATHING, what should I do?	0,92
a) I sit him down and give him water.	
b) I put him on its side.	
c) I tell him what happened.	
d) I take him to a cooler place.	
6. If after some time performing compressions in the center of the person's chest, I verify that he/she is still unconscious and not breathing, what should I do?	0,92
a) I will continue with compressions until help arrives.	
b) I ask someone to help and I start filming.	
c) I ask someone else to do the compressions while I rest.	
d) I continue compressions, even if I feel very tired.	
7. Why should compressions be given to the center of the chest in the person in cardiac arrest?	1
a) Because with each compression it stimulates the heart and blood reaches the entire body.	
b) For him to wake up, walk and go home.	
c) Because the air enters the lungs better.	
d) Because the person may be choking and thus the foreign body may come out.	
8. What should we do when the ambulance arrives?	1
a) I retire and go home.	
b) I start filming with my cell phone.	
c) Explain to him what has been done until his arrival.	
d) Accompany the person to the hospital.	

CVI-1=Content Validation Index applied to the questions. * Emergency phone number - Firefighters of Peru

Table 2. Content Validation Index of the instrument developed to assess attitudes about Basic Cardiopulmonary Resuscitation in adolescents, obtained through the evaluation of specialists. Peru, 2021

Questions	CVI-I
1. I feel capable and prepared to react to an emergency situation.	1
2. I am able to remain calm when faced with a person who has fainted and is NOT breathing.	1
3. I feel capable of making decisions when I am faced with a person who has fainted and is NOT breathing.	1
4. I am able to quickly call an emergency system, for example, the fire department (116), when I find a person who has fainted and is NOT breathing.	1
5. I feel able to report the details to the telephone operator of the emergency system, for example, the fire	1
6. I feel able to open the airway in an unconscious person.	0.92
7. I feel able to perform center chest compressions on an unknown person in cardiac arrest.	1
8. I feel able to perform center chest compressions on a close family member in cardiac arrest.	0,85
9. I feel capable of informing the health professionals of the procedure performed on the person in cardiac arrest.	1
10. I feel able to LEARN Cardiopulmonary Resuscitation because with it I can save lives.	1
11. I feel able to PERFORM Cardiopulmonary Resuscitation because with it I can save lives.	1

CVI-I Content Validation index applied to questions

Table 3. Semantic validation of the Instrument developed to assess knowledge about Basic Cardiopulmonary Resuscitation performed by adolescents. Peru, 2021

1- What is a heart arrest?
c) **lack** of breathing.
d) **abrupt** loss of conciousness.

3. ¿ What should I say when I call the emergency **number,** for example, the fire department 116?

5If after doing the compressions in the center of the person's chest **I CONFIRM THEY ARE BREATHING**

Note: In bold the modified words

breathing", final statement, "I feel able of quickly call an emergency number, for example, the fire department (116), when I find a person who has fainted and is NOT breathing"; Question 5, initial statement "I feel able to report the details to the telephone operator of the emergency system, for example, to the firemen, in a calm way", final statement "I feel capable of reporting the details to the emergency telephone operator in a calm way". In addition, the acronym "CPR" was added after the term cardiopulmonary resuscitation in questions 10 and 11.

Table 4. Semantic validation of the instrument developed to assess attitudes related to Basic Cardiopulmonary Resuscitation in adolescents. Peru, 2021

1. I feel able and prepared to react to an emergency in which life is in danger.
4. I feel able to quickly call an emergency number, for example, the fire department (116), when I find a person who has fainted and is NOT breathing.
5. I feel able to calmly report details to the emergency operator.
10. I feel able to LEARN Cardiopulmonary Resuscitation (CPR) because with it I can save lives.
11. I feel able to PERFORM Cardiopulmonary Resuscitation (CPR) because with it I can save lives.

Note: in bold the modified words

Discussion

In this study, the content and semantic validity of two instruments developed to determine the knowledge and attitudes of adolescents related to CPR after receiving standardized training were evaluated.

Unlike the study, aimed at adolescents, the levels of competence in the actions that must be carried out during a resuscitation in the hospital or in medicalized ambulances are evaluated in professionals and students of Health Sciences, for instance, the identification of CA by means of carotid pulse palpation, heart rate monitoring, use of a defibrillator, knowledge of drugs, airway instrumentation, among other procedures.(8,14,15,19-21)

The school teaches and develops health promotion and prevention among students. It is important that students learn to identify and care for cardiac arrest,(22) and this training should adequately measure their knowledge and emotional response.(8,14,15) The study verified that all the elements of the instrument proposed to evaluate that the CPR knowledge was adequate and pertinent, all of them individually and collectively obtained high rates of CVI-1 and CVI, respectively, however, some observations were noted by the evaluators and adapted according to suggestions, which coincides with what was reported by Lima *et al*.,(23) in that these adaptations are a fundamental step for the completion of the materials used in the health education activities. The research involved a group of professionals with an affinity for the subject in the content validation, this being a favorable aspect in the results obtained and coinciding with Meneguin *et al,* who refer that the group of professionals presents credibility and a favorable aspect, since it brings together various specialized knowledge on the subject addressed.(24)

The validity of the elements of the instrument to assess attitudes were also adequate and relevant, supported by high CVI-1 and CVI values. Some terms not understood were also reported by adolescents, which were adapted as long as they were not specific and irreplaceable terms in the subject under study and citing again Mielli *et al.* (15) and Broomfield *et al.*,(21) indicate a deficit of knowledge and not understanding. It can be affirmed that the questions asked to assess knowledge, adapted from instruments aimed at health sciences professionals and students,(14) are valid.

Various authors indicate that the level of comprehension of the questions increases after the training intervention, with the doubts being generated from content and not from comprehension.(15,20) The semantic validation of the instruments indicates that they are well constructed from the point of view of communicative, that is, they adequately show their intention and purpose,(10) however, some observations were noted by the adolescents and adapted according to suggestions for understanding the questions in their entire context. Several studies have measured the self-efficacy or self-confidence of professionals and/or students of health sciences regarding their CPR skills, stating that both increase with the experience studied and with the re-accreditation of competence through periodic training activities. (8,14) which is also applicable to the population under study.

As an application in practice, this research provides a useful tool for learning assessment and self-assessment, and a beginning to be able to develop other CPR self-efficacy scales.

This study has several limitations. In the first place, we face the difficulty of locating expert judges with lines of research in CPR in Peru, with at least a master's degree. A second limitation was the adolescents' difficulty in understanding the specific vocabulary used in CPR. Finally, indicate the limitation of having to hold meetings with adolescents over the internet due to confinement due to the COVID-19 pandemic. The future lines of research are aimed at carrying out the psychometric validation of the instruments provided.

Conclusion. The semantic and content validation of the instruments studied showed that they are suitable for assessing the knowledge and attitudes of adolescents related to CPR, so their use is recommended in the evaluation of training actions in this population group. By using these instruments during the evaluation of cardiopulmonary resuscitation training, the assistance provided to the victim of a CA will benefit from the standardization of the intervention received.

References

1. Gräsner JT, Wnent J, Herlitz J, Perkins GD, Lefering R, Tjelmeland I, et al. Survival after out-of-hospital cardiac arrest in Europe - Results of the EuReCa TWO study. Resusc. 2020; 148:218-26.
2. Gräsner JT, Herlitz J, Ingvild BM, Tjelmeland I, Wnent J, Masterson S, et al. European Resuscitation Council Guidelines 2021: Epidemiology of cardiac arrest in Europe. Resusc. 2021;161:61-79.
3. Böttiger BW, Semeraro F, Altemeyer KH, Breckwoldt J, Kreimeier U, Rücker G, et al. Kids save lives: Schoolchildren education in resuscitation for Europe and the world. Eur. J. Anaesthesiol. 2017; 34(12):792-6.
4. Kuvaki B, Özbilgin S. "School Children Save Lives." Turk. J. Anaesthesiol. Reanim. 2018; 46(3):170.
5. Semeraro F, et al. "KIDS SAVE LIVES—Three years of implementation in Europe." Resusc. 2018; 131:e9-e11.
6. Banfai B, Pek E, Pandur A, Csonka H, Betlehem J. The year of first aid': effectiveness of a 3-day first aid programme for 7-14-year-old primary schoolchildren. Emerg. Med. J. 2017; 34:526–32.
7. Pivač S, Gradišek P, Skela-Savič B. The impact of cardiopulmonary resuscitation (CPR) training on schoolchildren and their CPR knowledge, attitudes toward CPR, and willingness to help others and to perform CPR: mixed methods research design. BMC Public Health. 2020; 20:915.
8. Lucas MG, Nalin GV, Sant'Anna ALGG, Oliveira SA, Machado RC. Validation of content of an instrument for evaluation of training in cardiopulmonary resuscitation. REME – Rev. Min. Enferm. 2018; 22:e-1132.
9. Wynd CA, Schmidt B, Schaefer MA. Two quantita-tive approaches for estimating contente validity. West. J. Nurs. Res. 2003; 25(5):508-18.
10. Medeiros RKS, Ferreira Júnior MA, Pinto DPSR, Vitor AF, Santos VEP, Barichello E. Modelo de validação de conteúdo de Pasquali nas pesquisas em enfermagem. Rev. Enf. Ref. 2015; 4(4):127-35.
11. Snow CE, Uccelli P. The challenge of academic language. En D. Olson & N. Torrance (Eds.). Cambridge Handbook of Literacy. Cambridge: Cambridge University Press; 2009. p. 112-133.

12. Santos AAA, Moraes MS, Lima TH. Reading and motivation understanding for learning of fundamental teaching students. Psicol. Esc. Educ. 2018; 22(1):93-101.
13. Coluci MZ, Alexandre NM, Milani D. Construction of measurement instruments in the area of health. Ciên. Saúde Colet. 2015; 20(3):925-36.
14. Navalpotro PS, Torre PJC. Preparation and validation of a self-efficacy scale in cardiopulmonary resuscitation for Health Sciences students. Metas Enferm. 2017; 20(6):22-31.
15. Mielli G, Machado RC, Oliveira I, et al Validation of evaluating instrument for training nurses in cardiopulmonary resuscitation. R. Pesq. Cuid. Fundam. 2021;13:960-5.
16. Panchal AR, Bartos JA, Cabañas JG, Donnino MW, Drennan IR, Hirsch KG, et al. Part 3: Adult and Advanced Life Support: 2020 American Heart Association Guidelines for cardiopulmonary resuscitacion an emergency cardiovascular care. Circ. 2020; 142(16):S366–S468.
17. Olasveengen T, Semeraro F, Ristagno G, Castren M, Handley AJ, Kuzovlev A, et al. European resuscitation council guidelines for resuscitation 2021: Basic life support. Resusc. 2021; 161:98-114.
18. Nolan JP, Monsieurs KG, Bossaert L, Böttiger BW, Greif R, Lott C, et al. European Resuscitation Council COVID-19 guidelines executive summary. Resusc. 2020; 153:4555.
19. Rubio DM, Ber-Weger M, Tebb SS, Lee ES, Rauch S. Objectifying content validity: conducting a content validity study in social work research. Soc. Work. Res. 2003; 27(2):94-111.
20. Heng K, Wee FC. Seventeen years of life support courses for nurses: where are we now? Singap. Med. J. 2017; 58(7):453-5.
21. Broomfield R. A quasi-experimental research to investigate the retention of basic cardiopulmonary resuscitation skills and knowledge by qualified nurses following a course in professional development. J. Adv. Nurs. 2017; 23(5):1016-23.
22. Dantas RAN, Dantas DV, Silva IRN, Araújo NM, Laurentino AMA, Nunes HMA et al. Abordagem dos primeiros socorros na escola: crianças, adolescentes e professores aprendendo a salvar vidas. Enferm. Bras. 2018; 17(3):259-65.
23. Lima AC, Bezerra KC, Sousa DM, Rocha JF, Oriá MO. Development and validation of a booklet for prevention of vertical HIV transmission. Acta Paul. Enferm. 2017; 30(2):181-9.
24. Meneguin S, Pollo CF, Garuzi M, Reche MC, Benichel CR, Segalla AVZ. Validação de um instrumento acerca do conhecimento de alunos de graduação em situações de emergência. Rev. Norte Mineira Enferm. 2020; 9(2):57-68.

Original article

UNIVERSIDAD
DE ANTIOQUIA
1803

Challenges for maintaining surgical care practices in the COVID-19 pandemic: an integrative review

José Erivelton de Souza Maciel Ferreira[1,8]
https://orcid.org/0000-0003-2668-7587
Tahissa Frota Cavalcante[2,8]
https://orcid.org/0000-0002-2594-2323
Raphaella Castro Jansen[3,8]
https://orcid.org/0000-0002-4032-5825
Daniel Freitas Oliveira Damasceno[4,8]
https://orcid.org/0000-0002-9664-6660
Lídia Rocha de Oliveira[5,8]
https://orcid.org/0000-0001-7716-1388
Maria Jocelane Nascimento da Silva[6,8]
https://orcid.org/0000-0003-1764-7460
Ana Paula Rodrigues[7]
https://orcid.org/0000-0001-8376-0037

Challenges for maintaining surgical care practices in the COVID-19 pandemic: an integrative review

Abstract

Objective. to present the knowledge produced on challenges of health services for maintaining surgical care practices in times of the COVID-19 pandemic. **Methods.** this is an integrative literature review, performed with descriptors 'Operating rooms' and 'Coronavirus Infections' in the MEDLINE/PubMed Central, IBECS, LILACS, BDENF, *Coleta SUS*, BIGG, BINACIS, SciELO, PubMed, Science Direct, and Cochrane Library databases. **Results.** of the 405 studies analyzed, 27 met the inclusion criteria. The main challenges for surgical services during the pandemic were: (i) rearrangement of general practice in surgical units; (ii) administration and management of resources and elective surgeries; (iii) follow-up and control of preoperative patients to medium term; (iv) maintenance of patients' and health professionals' autonomy and mental health in this context; and (v) teaching health residents in

1 Nurse, Master's student.
Email: eriveltonsmf@gmail.com.
Correspondence author.
2 Nurse, Ph.D. Adjunct Professor.
Email: tahissa@unilab.edu.br
3 Nurse, lato sensu graduate student. Brazil.
Email: raphaella.jansen@gmail.com
4 Nurse, Master's student.
Email: danielfreitas17@yahoo.com.br
5 Nurse, Master's student.
Email: lidiarocha2021@gmail.com
6 Nurse, Master's student.
Email: jocelane.nascimento.silva@gmail.com
7 Physical education, Ph.D. Universidad de la Empresa, Uruguay. Email: anapaula_apr@hotmail.com.br
8 Universidade da Integração Internacional da Lusofonia Afro-Brasileira, Brazil.

Conflict of interest: None
Submitted: August 21, 2021.
Approved: March 3, 2022.
How to cite this article: Ferreira JESM, Cavalcante TF, Jansen RC, Damasceno DFO, Oliveira LR, Silva MJN, Rodrigues AP. Challenges for maintaining surgical care practices in the COVID-19 pandemic: an integrative review. Invest. Educ. Enferm. 2022; 40(1):e16.
DOI: https://doi.org/10.17533/udea.iee.v40n1e16.

UNIVERSIDAD DE ANTIOQUIA 1803
Investigación y Educación en
Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

the operating room. **Conclusion.** for surgical care services, the challenges caused by managing the high demand of patients in need of care resulted in the transfer of own resources to other units and the consequent hiring of professionals to meet the demand for these services due to the damming of postponed elective surgeries. This knowledge will allow us to propose strategies in decision making in this scenario, considering the new waves that may arise from this disease.

Descriptors: surgicenters; coronavirus infections; delivery of healthcare; health management; nursing.

Desafíos para mantener las prácticas de cuidado quirúrgico durante la pandemia de COVID-19: una revisión integrativa

Resumen

Objetivo. Presentar el conocimiento producido sobre los desafíos de los servicios de salud para el mantenimiento de las prácticas de atención quirúrgica en tiempos de pandemia por COVID-19. **Métodos**. Revisión integradora de la literatura, realizada con los descriptores 'Centros quirúrgicos' e 'Infecciones por Coronavírus' en las bases de datos Medline/PubMed Central, IBECS, LILACS, BDENF, Collects SUS, BIGG, BINACIS, SCIELO, PUBMED, SCIENCE DIRECT y Cochrane Library. **Resultados.** De 405 estudios analizados 27 cumplieron los criterios de inclusión. Los principales desafíos para los servicios de cirugía durante la pandemia fueron: (i) la reorganización de la práctica del cuidado general en las unidades quirúrgicas, (ii) la gestión y administración de recursos y de las cirugías electivas, (iii) el seguimiento y control de los pacientes preoperatorios a medio plazo, (iv) el mantener la autonomía y la salud mental del paciente y de los profesionales sanitarios en este contexto, y (v) la enseñanza de los residentes sanitarios en el quirófano. **Conclusión.** Para los servicios de atención quirúrgica los retos ocasionados por el manejo de la alta demanda de pacientes con necesidad del cuidado tuvo como consecuencia la transferencia de recursos propios a otras unidades y la contratación posterior de profesionales para suplir la demanda de estos servicios ante el represamiento de cirugías electivas pospuestas. Este conocimiento permitirá plantear estrategias en la toma de decisiones frente a este escenario, considerando las nuevas olas que se pueden presentar de esta enfermedad.

Descriptores: centros quirúrgicos; infecciones por coronavirus; atención a la salud; gestión en salud; enfermería.

Desafios para a manutenção das práticas de cuidados cirúrgicos na pandemia por COVID-19: uma revisão integrativa

Resumo

Objetivo. Apresentar o conhecimento produzido sobre os desafios dos serviços de saúde para a manutenção das práticas de cuidados cirúrgicos em tempos de pandemia por COVID-19. **Métodos.** Revisão integrativa da literatura, realizada com os descritores 'Centros Cirúrgicos' e 'Infecções por Coronavírus' nas bases de dados Medline/PubMed Central, IBECS, LILACS, BDENF, Coleta SUS, BIGG, BINACIS, SCIELO, PUBMED, SCIENCE DIRECT e Cochrane Library. **Resultados.** Dos 405 estudos analisados, 27 preencheram os critérios de inclusão. Os principais desafios para os serviços cirúrgicos durante a pandemia foram: (i) a reorganização da clínica geral nas unidades cirúrgicas, (ii) a gestão e administração de recursos e cirurgias eletivas, (iii) o acompanhamento e controle de pacientes pré-operatórios a médio prazo, (iv) manutenção da autonomia e saúde mental do paciente e dos profissionais de saúde nesse contexto, e (v) ensino dos residentes de saúde no centro cirúrgico. **Conclusão.** Para os serviços de atendimento cirúrgico, os desafios causados pelo gerenciamento da alta demanda de pacientes com necessidade de atendimento resultaram no repasse de recursos próprios para outras unidades e consequente contratação de profissionais para atender a demanda desses serviços devido ao represamento de cirurgias eletivas adiadas. Este conhecimento permitirá propor estratégias na tomada de decisão diante desse cenário, considerando as novas ondas que podem surgir dessa doença.

Descritores: Centros Cirúrgicos; Infecções por Coronavírus; Assistência à Saúde; Gestão em Saúde; Enfermagem.

Introduction

This research aims to investigate the challenges that surgical health services have faced in the face of the COVID-19 pandemic in order to preserve safe and effective multidisciplinary healthcare. Infection with SARS-CoV-2, the etiological agent that causes the disease COVID-19, affects an exponentially growing number of individuals daily.(1) Due to its potential for transmission, contagion and lethality, a high number of people were infected worldwide, becoming responsible for the collapse of public and private services in the health systems of many countries. Due to this set of factors, the World Health Organization (WHO) declared the COVID-19 pandemic.(2) The clinical picture of affected cases varies from asymptomatic to mild, moderate and severe symptoms, and may progress to critical respiratory failure and even multiple organ failure.(3,4)

The COVID-19 pandemic has impacted all health sectors, with the need to issue some recommendations and guidelines for surgical practice and patient management during this new phase. WHO released the guideline for triage of surgical patients, prioritizing emergency surgeries and postponing elective procedures until the pandemic stabilizes.(5) As a result, due to the lack of effective treatments and even the immunizing vaccine at the time, many hospitals and surgical clinics had to restructure and rearrange their processes and care.(6) Many countries have designated hospitals and other physical health services for the management of patients infected with the disease.(7) Moreover, health authorities have mobilized the adoption of measures that meet the arrangement and assistance of these services, especially those that provide intensive care, since they are the most overloaded in the current context.(8) In view of this, challenges arise for the safe operation of these health services and with them the need to devise strategies for the arrangement and/or rearrangement of these spaces, including operating rooms or outpatient clinics.(9)

Studies show that the volume of surgical emergencies has dropped dramatically. However, in response to the pandemic, several hospitals around the world needed to prepare to meet a high demand from COVID-19 patients, many of whom required specialized care in ICUs. The most widespread recommendation by scholars was that surgical departments prepare for changes in the acute surgical needs of the population they assist, which could allow for a better allocation of limited resources.(10,11) Given this context, in order to follow institutional technical standards for disease prevention and control during surgical care practices throughout the perioperative period, it is believed that these services continue to overcome managerial, cultural, philosophical and structural challenges based on effective and safe strategies to maintain their proper functioning. Listing these challenges is important so that professionals from the surgical team understand the motivations that forced changes in their work routine and so that they can reflect on the different strategies to overcome the challenges also arising from these changes.

The innovative character of this research is supported by the fact that the proposed theme has gained international repercussion. Therefore, considering the relevance of the explained content, presenting the knowledge that was produced in those times is important for surgical teams to have this knowledge to understand and transform their care and management practice in the current pandemic context. Thus, this study aimed to present the knowledge produced about the challenges of health services for maintenance of surgical care practices in times of the COVID-19 pandemic.

Methods

This is an integrative literature review, characterized as a research method that makes it possible to gather, analyze and synthesize available research on certain topics in a systematic way. To prepare this integrative review, the following steps were followed: 1) theme identification and research guiding question construction; 2) problem and study objective identification; 3) literature search; 4) data collection; 5) critical analysis of results; and 6) presentation of synthesis.(12) The topic of interest was the arrangement of health services with regard to surgical care practices in times of the COVID-19 pandemic. The PICo strategy (Problem – Interest – Context) was used to formulate the guiding question as follows: What have been the challenges of health services for the arrangement of surgical care practices during the COVID-19 pandemic?

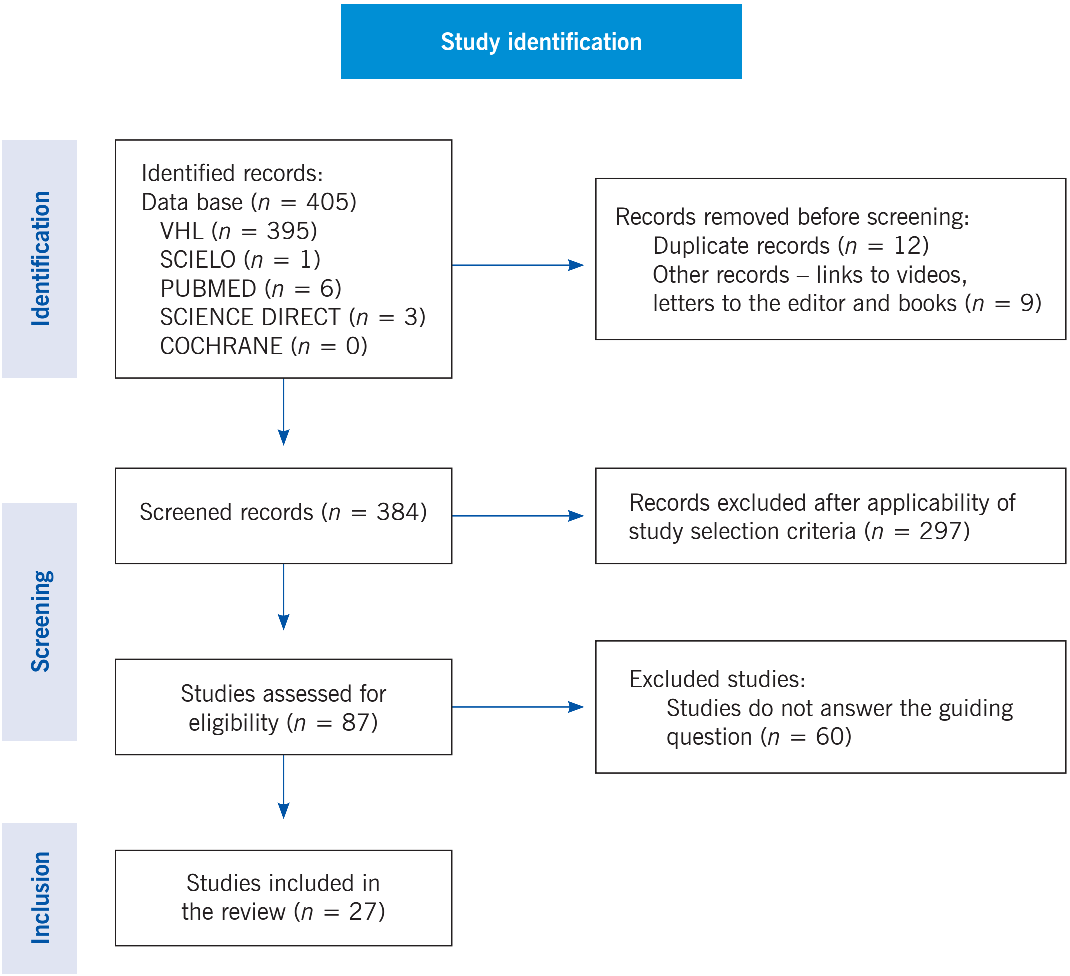
The data collection stage was carried out from consultations in the PubMed portal, the regional portal of the Virtual Health Library (VHL), in the academic search engine Science Direct, in the Cochrane database and in the Scientific Electronic Library Online (SciELO). The databases accessed from VHL were BDENF, LILACS, MEDLINE, IBECS, *Coleciona SUS*, BIGG, and BINACIS. For the databases accessed from the VHL, the Brazilian Health Science Descriptors (DeCS) were adopted, which were crossed as follows: "*Centros Cirúrgicos*" AND "*Infecções por Coronavírus*". For other consultations, controlled descriptors from the Medical Subject Headings (MeSH) of U.S. National Library of Medicine and the following crosses were performed: "Surgicenters" AND "Coronavirus Infections". In order to identify only articles that presented both terms in the same study, it was necessary to use the crossing between the descriptors with the Boolean operator "AND".

Scientific articles published and available electronically in full and that answered the guiding question of this research were included. The access to studies that were not available in full in the databases took place from the Coordination for the Improvement of Higher Education Personnel platform (CAPES - *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*). Articles that were repeated in the databases were excluded. The bibliographic search stage took place between February and April 2021 and the databases were accessed through a computer from a university linked to the world wide web, which were exhausted in a single day with recording of the search page. Study search and selection was paired.
Below, in Table 1, are the results of bibliographic search in the databases, where the proper distribution of articles found and selected is described.

Table 1. Quantitative distribution of found and selected articles

	Database	Articles found	Articles deleted after text skimming	Articles selected for full reading	Articles that answer the guiding question
Virtual Health Library	MEDLINE	352 (86.91%)	284 (70.12%)	68 (16.79%)	24 (5.92%)
	IBECS	20 (4.93%)	15 (3.7%)	5 (1.23%)	1 (0.24%)
	LILACS	15 (3.7%)	9 (2.22%)	6 (1.48%)	0
	BDENF	4 (0.98%)	2 (0.49%)	2 (0.49%)	1 (0.24%)
	Coleciona SUS	2 (0.49%)	1 (0.24%)	1 (0.24%)	0
	BIGG – Guias GRADE	1 (0.24%)	1 (0.24%)	0	0
	BINACIS	1 (0.24%)	0	1 (0.24%)	0
Total		**395 (97.53%)**	**312 (77.03%)**	**83 (20.49%)**	**26 (6.41%)**
International	SCIELO	1 (0.24%)	0	1 (0.24%)	0
	PUBMED	6 (1.48%)	2 (0.49%)	4 (0.98%)	1 (0.24%)
	SCIENCE DIRECT	3 (0.74%)	2 (0.49%)	1 (0.24%)	0
	COCHRANE	0	0	0	0
Total		**10 (2.46%)**	**4 (0.98%)**	**6 (1.48%)**	**1 (0.24%)**
Overall total		**405 (100%)**	**318 (78.51%)**	**87 (21.48%)**	**27 (6.66%)**

It is observed that a total of 405 articles were found. All were read from a dynamic, and text skimming was carried out by the appreciation of titles and abstracts, selecting those that had an interface with the subject of study for a full reading. Of these, 318 (78.51%) were excluded because they were duplicate manuscripts, were not articles or did not respond to the guiding question of this review. A total of 87 (21.48%) articles related to the subject were exhaustively analyzed; of these, 27 (6.66%) answered the guiding question. The identification, screening and inclusion processes are outlined in Flowchart 1.



Flowchart 1. Flowchart based on the PRISMA(13) model with the results of article selection

A validated data collection form was used to collect data from each article in the final sample and this instrument allowed the acquisition of information about article identification, type of publication, methodological characteristics of the study and level of evidence.(14) The same instrument was used in other integrative literature reviews.(15,16) Regarding the level of evidence, the studies were classified according to the Melnyk and Fineout-Overholt design.(17) This design works with the following levels of evidence: 1 – evidence from a systematic review, meta-analysis or clinical guidelines from systematic reviews of randomized and controlled clinical trials; 2 – evidence from at least one randomized controlled clinical trial; 3 – evidence from well-designed clinical trials without randomization;4 – evidence from a well-designed cohort and case-control study; 5 – evidence presented from a systematic review, from descriptive and qualitative studies; 6 – evidence from a single descriptive or qualitative study; 7 - evidence derived from opinion articles. Furthermore, the results were analyzed based on content and thematic analysis,(18) which were arranged into a single category, in the form of a table entitled as challenges for health services to rearrange surgical units.

Results

In Table 2, it is possible to obtain the main information of selected studies: identification, database, journal, year of publication, level of evidence and title corresponding to the information recorded.

It can be noted that most of the selected studies come from databases accessed through the VHL (*n*=26; 96.29%), mainly MEDLINE (*n*=24; 88.88%). Most were published in 2020 (*n*=25; 92.59%) and the others were published in 2021 (*n*=2; 3.3%). The journals that published the most on the researched topic and that answered the study question were those in the medical field (*n*=25; 92.59%). The studies are available in English, Spanish or Portuguese, most of them in English (*n*=26; 96.29%). As for the level of evidence of the selected articles, it was observed that 12 (44.44%) studies bring evidence of level 6, that is, derived from descriptive or qualitative studies. Below, Table 3 presents the challenges that healthcare services have faced and have faced in maintaining surgical care practices during the COVID-19 pandemic. The synthesis of results, in this table, was arranged into six categories, related to the following aspects: rearrangement of general care practices in surgical health units; challenges related to administration and management of the surgical sector; follow-up and control of mediate preoperative patients; patients' and health professionals' autonomy and mental health in this scenario; teaching and learning of multidisciplinary health residents in the operating room; and financial maintenance of public and private surgical health services.

Table 2. Selected national and international scientific production

Database	Journal and Year of publication	Level of evidence	Article title	Reference
IBECS	*Revista Española de Cirugía Ortopédica y Traumatológica* (2021)	Level 6	*Resultado de la implantación de consultas telemáticas en cirugía ortopédica y traumatología durante la pandemia COVID-19*	19
BDENF	*Sociedade Brasileira de Enfermagem de Operating room* (2020)	Level 7	Training and qualification of nursing professionals in the operating room to care for patients infected with SARS-CoV-2 in external areas	20
MEDLINE	The Annals of The Royal College of Surgeons of England (2021)	Level 4	St Andrew's COVID-19 surgery safety study: hand trauma.	21
MEDLINE	PloS one (2020)	Level 4	Surgery for non-Covid-19 patients during the pandemic.	22
MEDLINE	BMC Medicine (2020)	Level 5	Adapting hospital capacity to meet changing demands during the COVID-19 pandemic.	23
MEDLINE	Acta neurochirurgica (2020)	Level 4	Intensive care of traumatic brain injury and aneurysmal subarachnoid hemorrhage in Helsinki during the Covid-19 pandemic	24
MEDLINE	Journal of Medical Ethics (2020)	Level 7	Maternal request caesareans and COVID-19: the virus does not diminish the importance of choice in childbirth	25
MEDLINE	*Revista Española de anestesiologia y reanimación* (2020)	Level 6	Experience of a pediatric monographic hospital and strategies adopted for perioperative care during the SARS-CoV-2 epidemic and the rearrangement of urgent pediatric care in the Community of Madrid.	26
MEDLINE	European Journal of Cardio-Thoracic Surgery (2020)	Level 4	Clinical features and outcomes of thoracic surgery patients during the COVID-19 pandemic.	27
MEDLINE	*Actas Urológicas Españolas* (2020)	Level 6	Design of an assistance protocol for the restart of scheduled urologic surgery in a COVID-19 epidemic period.	28
MEDLINE	Anaesthesya (2020)	Level 4	The safety of paediatric surgery between COVID-19 surges: an observational study.	29
MEDLINE	Canadian Medical Association Journal (2020)	Level 4	Clearing the surgical backlog caused by COVID-19 in Ontario: a time series modelling study.	30
MEDLINE	Langenbeck's archives of surgery (2020)	Level 4	Transforming a surgical department during the outbreak of new coronavirus pandemic. Clinical implications	31
MEDLINE	Plastic and Reconstructive Surgery (2020)	Level 6	The Early Effects of COVID-19 on Plastic Surgery Residency Training: The University of Washington Experience	32
MEDLINE	Anaesthesia Critical Care & Pain Medicine (2020)	Level 7	How to resume elective surgery in light of COVID-19 post-pandemic propofol shortage: The common concern of anaesthesists and surgeons.	33
MEDLINE	World neurosurgery (2020)	Level 6	Adapting Neurosurgery Practice During the COVID-19 Pandemic in the Indian Subcontinent.	34

Table 2. Selected national and international scientific production. (Cont.)

Database	Journal and Year of publication	Level of evidence	Article title	Reference
MEDLINE	Annals of surgery (2020)	Level 7	Operationalizing the Operating Room: Ensuring Appropriate Surgical Care in the Era of COVID-19.	35
MEDLINE	Pediatric surgery international (2020)	Level 6	Challenges to delivering pediatric surgery services in the midst of COVID 19 crisis: experience from a tertiary care hospital of Pakistan.	36
MEDLINE	International Journal of Surgery (2020)	Level 6	Surgical activity during the Covid-19 pandemic: Results for 112 patients in a French tertiary care center, a quality improvement study.	37
MEDLINE	Pediatric Surgery International (2020)	Level 6	Assess, adapt and act: a paediatric surgery division's initial approach in a rapidly evolving pandemic.	38
MEDLINE	International Journal of Surgery (2020)	Level 6	Perspectives on how to navigate cancer surgery in the breast, head and neck, skin, and soft tissue tumor in limited-resource countries during COVID-19 pandemic.	39
MEDLINE	Updates in surgery (2020)	Level 6	Continuing our work: transplant surgery and surgical oncology in a tertiary referral COVID-19 center.	40
MEDLINE	Clinics (2020)	Level 6	Transforming operating rooms into intensive care units and the versatility of the physician anesthesiologist during the COVID-19 crisis.	41
MEDLINE	New England Journal of Medicine (2020)	Level 7	Surgery Scheduling in a Crisis.	42
MEDLINE	Anesthesia and analgesia (2020)	Level 7	COVID-19: Role of Ambulatory Surgery Facilities in This Global Pandemic.	43
MEDLINE	*Cirugía Española* (2020)	Level 4	SARS-CoV-2 pandemic on the activity and professionals of a General Surgery and Digestive Surgery Service in a tertiary hospital.	44
PUBMED	Journal of Thoracic Oncology (2020)	Level 6	Coronavirus Disease 2019 in the Perioperative Period of Lung Resection: A Brief Report From a Single Thoracic Surgery Department in Wuhan, People's Republic of China.	45

Table 3. Challenges for health services to rearrange surgical care practices during the COVID-19 pandemic

Challenges of health services to rearrange the surgical units	*n* (%)	References
Challenges in rearranging general care practices in surgical health facilities		
Execution of resolutive service in a single consultation	1 (3.7)	19
Increased attributions to the perioperative service nurse	1 (3.7)	20
Decision making to ensure the safety of patients and healthcare professionals during this challenging period	1 (3.7)	21
Readjustment of routine surgical practices	1 (3.7)	27
Hiring doctors and nurses to meet the demands of the operating room and other units	5 (18.51)	22, 38, 41, 42, 44
Overcoming the negative impacts on the care system for surgical patients with cancer or patients in need of transplants	3 (11.1)	39, 44, 45
Challenges related to administration and management of resources, beds and elective surgeries in the surgical sector		
Managing the high demand of patients requiring perioperative care	3 (11.1)	2, 33, 35
Transfer of material and human resources from the operating room to emergency units and ICUs	7 (25.92)	22, 24, 26, 31, 39-41
Management of the accumulation of postponed elective surgeries and the impacts of this waiting on patients' lives	6 (22.22)	22, 30, 31, 36, 37, 44
Supply and guarantee of surgical beds for all users	1 (3.7)	23
Challenges in follow-up and control of mediate preoperative patients		
Decision on the return of scheduled surgical activities	2 (7.4)	28, 29
Follow-up and control of clinical conditions of patients who have had their surgeries postponed	4 (14.81)	31, 39, 44, 45
Challenges in maintaining patients' and health professionals' autonomy and mental health in this scenario		
Maintaining patients' autonomy, including women, as to the choice of their type of childbirth (caesarean or not)	1 (3.7)	25
Maintenance of mental health and overcoming the shaken emotional aspects of surgical teams and patients	2 (7.4)	33, 34
Dismantling the waves of false information that surgical patients had access to about the COVID-19 disease	2 (7.4)	33, 34
Challenges in teaching multidisciplinary operating room health residents during the pandemic		
Maintaining continued and supervised education of residents	1 (3.7)	32
Challenges in the financial maintenance of public and private surgical health services		
Control of impacts that negatively affect private outpatient health services that offer elective procedures: loss of revenue and personnel	1 (3.7)	43

All selected articles brought at least one piece of information that was categorized as one of the challenges for health services that provide surgical care, regardless of whether it is public or private, to the detriment of the COVID-19 pandemic. The most cited challenges were management of the high demand of patients in need of perioperative care (11.1%), accumulation of elective surgeries postponed due to the COVID-19 pandemic (22.2%), transfer of resources from surgical centers to other units (25.9%) and hiring of professionals to meet the demands of these health services that provide surgical care (18.5%). Follow-up and controlling the clinical conditions of patients who had their surgeries postponed was also an important challenge emphasized (14.8%).

Discussion

Rearrangement of general care practices in surgical health units

As a result of the pandemic caused by the new SARS-CoV-2, health services that provide surgical care needed to reorganize their care practices. This required technical, scientific and management skills and knowledge on the part of those who run hospital and/or outpatient surgical units. A study(19) pointed out that, in the current pandemic context, surgical services needed to perform their care in a resolute way in a single consultation, especially with regard to medical and nursing surgical consultations. In this way, patients would be less exposed to the virus, as they would leave the house only once to solve their health demand and would be less exposed to the virus in the hospital or outpatient environment, reducing their chances of being infected by the new coronavirus.

It is known that surgical consultations are unpredictable, therefore, identifying patients' problems and solving them immediately will not always be possible, and, in these cases, there is a special interdependence between the client and the surgical team. Due to this fact, patients often end up traveling between many health services to have their complaint resolved as quickly as possible.(46) Thus, if a patient attends a preoperative consultation without presenting the requested or legible exams or with the absence of some important document, for example, it is a challenge for qualified professionals to continue with this service, even though they understand the current public health chaos. Some institutions were unable to employ resources, such as telemedicine, to solve this problem, while others were successful.(47)

More than ever before, this new era requires healthcare and management professionals to become increasingly skilled in their decision-making to ensure the safety of clients who seek help and professionals who risk their health to stay working.(21) Certainly, this is one of the main challenges that health services around the world face, including surgical ones. In the same proportion that the client lacks safe, error-free and damage-free care, professionals who offer this care must be well directed, in terms of their conduct, to remain free from legal proceedings, violence and health problems. More has been demanded of health professionals in these times, so keeping them productive amid pandemic tension and the increase in activities assigned to them is a challenge. In this scenario, surgical team professionals whose clinical-surgical attributions were expanded in order to meet the health service personnel's needs stand out.(20)

The current working conditions of health professionals, especially nurses, in many countries around the world, are marked by overload of activities, low remuneration and insufficient availability of personal protective equipment.(48) These factors are certainly the main responsible for the exhaustion, contamination, illness and death of these professionals who work courageously on the front line, whether in the wards, in the surgical centers or in ICUs. Many professionals at the beginning of the pandemic were removed because they had risk factors for COVID-19 and others continue to be contaminated, falling ill and/or dying, further reducing the number of professionals to work on the front line of the disease. This scenario has increasingly demanded that health units hire doctors and nurses to meet the demands of the operating room and other units.(22,38,41,42,44)

It is important to emphasize that, since graduation, there has always been a discussion about the number of insufficient professionals in health services to provide safe and resolute care. With the pandemic, it could be inferred that a worsening of this framework of insufficient professionals is primarily responsible for culminating in work overload for those who remain working, given the high demand of patients for urgent care.

Challenges related to administration and management of the surgical sector

The difficulty faced by health units to manage the high demand of patients who require urgent perioperative care was one of the challenges highlighted, and this required important resignifications in this sector, even if temporary. Scholars(20,33,35) reveal that the high demand for patients and care, in public or private institutions, required the support of perioperative nursing to provide intensive care to patients in need of critical care in the anesthetic recovery rooms, because they ended up admitting critical postoperative patients indicative of ICU admission. Managing a surgical sector in these conditions was extremely delicate.

One of the greatest concerns of managers of these health services was regarding the control and availability of beds for intensive care for victims of COVID-19.(11) This led the management teams of these institutions, at the global level, to envision ways to transfer material and human resources from the operating room to the first aid units and ICUs.(22,24,26,31,39,40,41) Concomitantly, these managers were also concerned with providing enough emergency surgical beds to meet the demand of users who needed it.(23) With material and human resources already limited in all sectors, it was certainly challenging for managers to decide the best strategies for relocating personnel and materials at this unit to those whose service demand was higher. It is also possible to reflect that managing surgical units with fewer professionals and materials has also become challenging, even more so with the condition of keeping emergency surgical beds available for patients with COVID-19.

In the waves of contagion of the disease, elective surgeries had to be postponed. As a result, the number of elective surgeries generated an increasing volume of backlogs. Managing this accumulation and the impacts of this waiting on the lives of patients worried health services.(22,30,31,36,37,44) It became necessary, therefore, to devise ways to overcome the negative impacts on the system of care for elective surgical patients, especially those with important chronic conditions such as cancer or who need transplants.(39,44,45) Studies indicate that patients with long-deferred elective surgical indications can evolve to a poor prognosis and, at times, can be fatal. Thus, assessing the feasibility of performing elective surgeries during the COVID-19 pandemic has been extremely necessary, especially during the waves of contagion. Certain clinical conditions and diseases, especially those that present stages of evolution, can progress to a degree that manifests organic responses that cause suffering to patients and irreversible damage to patients.(49) It is also recommended that cancer patients or those in need of transplants should not have their surgeries postponed.(49,50)

Due to the cases of patients who presented a bad evolution of their clinical condition because their surgeries were postponed, the need to follow up and control the clinical conditions of all patients who had their surgeries postponed because they were classified as elective.(31,39,44,45) Administration and management of all these nuances was of utmost importance during the peaks of the waves of contagion and hospitalization of patients by COVID-19.

Follow-up and control of mediate preoperative patients

The researchers(51) revealed that following up patients with surgical indication has become a challenge because many patients, during peaks of contagion, do not attend their control and routine appointments and, as a result, follow-up visits are seriously interrupted. In this case, one should consider the fear that these patients have of being contaminated when seeking health services during this period, even recognizing the worsening of their health condition. Thus, considering the concern of health professionals with these patients and the negative clinical outcome of these subjects, reflections began to drive the idea that scheduled surgical activities should be restarted.(28,29)

Deciding to resume elective surgical activities in the pandemic scenario, especially amidst the waves of contagion, requires constant observation about the readjustment of institutional routine surgical practices. This is necessary in order to ensure the safety of assisted patients and healthcare professionals. This challenge requires an important dedication from all those involved in the assistance and from those who are in charge of developing protocols and guidelines for institutional care.(27) Guidance on the return of essential and non-essential surgeries during the COVID-19 pandemic continues to be carried out, especially after the peaks of contamination by the new SARS-CoV-2. In some countries, the recommendation, before restarting elective surgical programming after a wave of contamination of the population by COVID-19, is to carry out a survey of the occupancy rate of ICU beds, analyze the moment of resumption, considering the incidence rate of COVID-19, flow of care and protocols registered in regional medical councils, in order to always maintain autonomy of patients to the best of their ability.(52,53)

Patients' and health professionals' autonomy and mental health in this scenario

The maintenance of patients' autonomy in the context of healthcare in these times of pandemic was widely discussed, including that of women in choosing their type of childbirth.(25) Therefore, the elaboration of care protocols to be implemented in childbirth, puerperium and abortion during the current pandemic in agreement with the restrictions imposed by institutional guidelines on surgical activities during peaks of contagion by this disease has been considered important, respecting the autonomy of women throughout the puerperium or abortion process.(54,55) Although the current situation seems to haunt health professionals, it is important to evoke the importance that caring holistically involves humanization. The autonomy of no patient and health professional should be questioned or disrespected.

Another important challenge to be discussed is mental health and overcoming the shaken emotional aspects of patients and professionals who make up the surgical team.(33,34) Those who care for the sick may become mentally ill; this emotional exhaustion can favor the loss of team personnel and the increase of professionals with mental disorders acquired as a result of the COVID-19 pandemic, with special emphasis on those who make up the nursing team.(56) It is important that the institutions themselves provide psychological support services for these professionals, so that they follow them up until discharge and return to activities.

Surgical patients are not exempt from being mentally affected, especially in the era of fake news, a challenging period for health professionals to be able to demystify the waves of false information that spread about the COVID-19 disease.(33,34) Unconventional issues such as loss of economic pay, mental health concerns, the impact of social media, and the wave of surveys and webinars are the main factors affecting the mental health of these patients. Violence and threats to health professionals are also due to access to false information about scientifically proven treatment and conduct.(34)

In professional practice, patients are commonly seen emotionally hesitant, insecure and fluctuating about their thoughts and attitudes as a result of their surgical condition. In addition to these factors that affect the mental health of these patients, it is important to point out that professionals from the surgical team and their residents should pay attention to this situation of overlapping risk factors for mental illness. This is important so that these clients do not give up on their treatment and/or do not fail to adhere to the healthcare prescribed by the multidisciplinary team throughout or at some specific time during the perioperative period. Studies show that psychology residents have contributed significantly to this situation.(57)

Teaching and learning of multidisciplinary health residents in the operating room

Health residents' professional performance in surgical units is essential for holistic healthcare and for controlling the demand of patients who need clinical-surgical care. However, the education and arrangement of these professionals in these times of pandemic was seriously compromised at the peak of the disease.(32,58) These resident professionals from different professions, whether in nursing, medicine, psychology, physiotherapy, among others, have been continuously acting in the face of COVID-19, even with the limitations imposed by the pandemic.(59-61) However, due to professional inexperience, these resident professionals and trainees may be more exposed to the disease, and that is why the responsible institutions and their supervisors must continuously offer them training and qualification courses to face the pandemic over time in these services, even if they are vaccinated. It is also necessary to encourage more reflections on teaching strategies in the multidisciplinary residency that should be adopted, with a focus on overcoming the challenges imposed in the teaching and learning of these agents.

In this scenario, the presence of tutors responsible for these subjects is essential so that they can supervise the professional practice of these health residents with excellence. Surgical patients need quality care that prevents and minimizes the risks involved during surgery. Patients with COVID-19 or with COVID-19 sequels during infection or post-infection, with or without sequels, need multidisciplinary residents and qualified institutional staff.

Financial maintenance of public and private surgical health services

Finally, it should be noted that the impacts of this pandemic have not only affected the community and public health institutions, but also private outpatient services that offer elective procedures. The main challenges focused on overcoming the loss of revenue and personnel for some of these units, especially for public services.(43) These health units have suffered considerable economic impacts, being more significant for public services, since they need a minimum income to pay for their health personnel employed and materials. Although it was seen that many health institutions hired more professionals, many others had to be fired due to the suspension of elective procedures, which led to a decrease in the income of the institutions for this sector. Revenues that were previously destined for public health clinics, for instance, needed to be reallocated to the structuring and operationalization of field hospitals.(43) After the waves of contagion, these challenges were gradually overcome. Failure to fully overcome these impacts can lead to a significant lack of coverage in certain geographic regions, as well as the overcrowding of surgical reference units.

Study limitations and suggestions for future studies

Although the present study consisted of a significant sample of articles, it was not possible to exhaust all existing databases, academic search engines, portals and libraries, nor to carry out more than one crossing of descriptors. Furthermore, during the course of the study, some issues related to the challenges of current care practices in the context of surgical service units were identified. These issues pointed out and discussed may be objects of further research, such as strategies that have been proposed and discussed by scholars to overcome these challenges listed.

Conclusion. The main challenges that surgical services have faced or continue to face in this period of the COVID-19 pandemic are the transfer of resources from operating rooms to other units and the hiring of professionals to meet the demands of health services that provide surgical care. Finally, discussing and reflecting on the challenges that have affected and continue to affect outpatient and hospital health services is important. Such reflections encourage professionals, who work on the front line and in the management of these services, to know the motivations that led surgical health services to adopt radical changes in a timely manner to offer safe care to patients affected by COVID-19.

The study started from the need to know the evident impacts of the COVID-19 pandemic on health sectors, especially in operating rooms. The results found and the discussions raised allow greater clarity about the challenges in surgical processes during the COVID-19 pandemic. In this regard, they can help health professionals, whether assistance or managers, in decision-making regarding the strategies that could and that can be traced in the face of the current scenario and the likely new waves of contagion of this disease.

References

1. Gostic K, Gomez AC, Mummah RO, Kucharski AJ, Lloyd-Smith JO. Estimated effectiveness of symptom and risk screening to prevent the spread of COVID-19. Elife. 2020; 9:e55570.
2. Rothan HA, Byrareddy SN. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. J Autoimmun. 2020; 109:102433.
3. Wang D, Hu B, Hu C, Zhu F, Liu X, Zhang J, et al. Clinical Characteristics of 138 Hospitalized Patients With 2019 Novel Coronavirus-Infected Pneumonia in Wuhan, China [published correction appears in JAMA. 2021 Mar 16; 325(11):1113]. JAMA. 2020; 323(11):1061-9.
4. Al-Tawfiq JA. Asymptomatic coronavirus infection: MERS-CoV and SARS-CoV-2 (COVID-19). Travel Med Infect Dis. 2020; 35:101608.
5. Ghai S. Will the guidelines and recommendations for surgery during COVID-19 pandemic still be valid if it becomes endemic? Int. J. Surg. 2020; 79:250-1.
6. Cobianchi L, Pugliese L, Peloso A, Dal Mas F, Angelos P. To a New Normal: Surgery and COVID-19 During the Transition Phase. Ann. Surg. 2020; 272(2):e49-e51.
7. Tirupathi R, Bharathidasan K, Palabindala V, Salim SA, Al-Tawfiq JA. Comprehensive review of mask utility and challenges during the COVID-19 pandemic. Infez. Med. 2020; 28(suppl 1):57-63.
8. Phua J, Weng L, Ling L, Egi M, Lim CM, Divatia JV, et al. Intensive care management of coronavirus disease 2019 (COVID-19): challenges and recommendations. Lancet Respir. Med. 2020; 8(5):506-17.
9. Sousa, JBM. Investigar para transformar: um diálogo necessário frente aos desafios impostos pela Pandemia da COVID-19. Rev. Ang. Ciênc. 2020; 2(1):1-5.
10. Pereira X, Lima DL, Moran-Atkin E, Malcher F. Where have the surgical patients gone during the COVID-19 pandemic? Rev. Col. Bras. Cir. 2020; 47:e20202733.
11. Arnal-Velasco D, Planas-Roca A, García-Fernández J, Morales-Conde S. Safe elective surgery during COVID-19. The relevance of collaborative work. Rev. Esp. Anestesiol. Reanim. (Engl Ed). 2021 Feb; 68(2):62-4.
12. Soares CB, Hoga LA, Peduzzi M, Sangaleti C, Yonekura T, Silva DR. Revisão integrativa: conceitos e métodos utilizados na enfermagem [Integrative review: concepts and methods used in nursing]. Rev. Esc. Enferm. USP. 2014; 48(2):335-45.
13. Haddaway NR, Mcguinness LA. PRISMA 2020: pacote R e ShinyApp para produzir diagramas de fluxo compatíveis com PRISMA 2020 (Versão 0.0.1). 2020.
14. Ursi ES, Gavão CM. Perioperative prevention of skin injury: an integrative literature review. Rec. Lat-Am. Enfermagem. 2006; 14(1):124-31.
15. Ferreira JESM, Oliveira LR, Marques WS, Lima TS, Barbosa ES, Castro RR, et al. Health Information Systems to support Primary Health Care management: an integrative review. RECIIS (online). 2020; 14(4):970-82.

16. Cavalcante TF, Ferreira JESM, Moreira RP, Nemer APL. Nursing interventions for the prevention of falls in patients with stroke. Int. Develop. Res. 2018; 8(1):18221-5.
17. Melnyk BM, Fineout-Overholt E. Evidence-based practice in nursing & healthcare: a guide to best practice. Lippincott Williams & Wilkins; 2011.
18. Breches B, Ribeiro VM, Vóvio CL, Haas CM. Procedimentos metodológicos para se eleger categorias de análise baseadas em referências teórico-conceituais. Educ. Fronteiras. 2018; 8(22):221-35.
19. Navas PZ, Heredia EM, Orellana JN, García CG, Obando LC, Rebollo LC, et al. Resultado de la implantación de consultas telemáticas en cirugía ortopédica y traumatología durante la pandemia COVID-19. Rev. Esp. Cir. Ortop. Traumatol. 2021; 65(1):54-62.
20. Acuña AA, Sousa CS. Training and qualification of nursing professionals in the operating room to care for patients infected with SARS-CoV-2 in external areas. Rev. SOBECC. 2020M 25(4):195-6.
21. Miranda BH, Zberea DE, Pinto-Lopes R, Zweifel CJ, Sierakowski A, Sood MK. St Andrew's COVID-19 surgery safety study: hand trauma. Ann. R. Coll. Surg. Engl. 2021; 103(2):96-103.
22. Hübner M, Zingg T, Martin D, Eckert P, Demartines N. Surgery for non-Covid-19 patients during the pandemic. PLoS One. 2020; 15(10):e0241331.
23. McCabe R, Schmit N, Christen P, D'Aeth JC, Løchen A, Rizmie D, et al. Adapting hospital capacity to meet changing demands during the COVID-19 pandemic. BMC Med. 2020; 18(1):329.
24. Luostarinen T, Virta J, Satopää J, Bäcklund M, Kivisaari R, Korja M, et al. Intensive care of traumatic brain injury and aneurysmal subarachnoid hemorrhage in Helsinki during the Covid-19 pandemic. Acta Neurochir (Wien). 2020; 162(11):2715-24.
25. Romanis EC, Nelson A. Maternal request caesareans and COVID-19: the virus does not diminish the importance of choice in childbirth. J. Med. Ethics. 2020; 46(11):726-731.
26. García EM, Diego PR, Heras CTL, Escudero PC. Experience of a pediatric monographic hospital and strategies adopted for perioperative care during the SARS-CoV-2 epidemic and the reorganization of urgent pediatric care in the Community of Madrid. España. Rev. Esp. Anestesiol. Reanim (Engl Ed). 2020; 67(9):527-8.
27. Jiménez MS, Alarza FH, Serna IM, Fernández CM, Pardo JCM, Salcedo JAG, et al. Clinical features and outcomes of thoracic surgery patients during the COVID-19 pandemic. Eur. J. Cardiothorac. Surg. 2020; 58(4):738-44.
28. Jiménez MS, Alarza FH, Serna IM, Fernández CM, Pardo JCM, Salcedo JAG, et al. Design of an assistance protocol for the restart of scheduled urologic surgery in a COVID-19 epidemic period. Diseño de un protocolo asistencial para el reinicio de la cirugía urológica programada en periodo de epidemia COVID-19. Actas Urol. Esp (Engl Ed). 2020; 44(9):597-603.
29. Okonkwo I, Howie A, Parry C, Shelton CL, Cobley S, Craig R, et al. The safety of paediatric surgery between COVID-19 surges: an observational study. Anaesthesia. 2020; 75(12):1605-13.
30. 30. Wang J, Vahid S, Eberg M, Milroy S, Milkovich J, Wright FC, et al. Clearing the surgical backlog caused by COVID-19 in Ontario: a time series modelling study. CMAJ. 2020; 192(44):e1347-e1356.
31. 31. Vilallonga R, Gordejuela AGR, Cossio-Gil Y, González JMD, Sánchez RM, Carrasco MA. Transforming a surgical department during the outbreak of new coronavirus pandemic. Clinical implications. Langenbecks Arch. Surg. 2020; 405(6):867-75.
32. Cho DY, Yu JL, Um GT, Beck CM, Vedder NB, Friedrich JB. The Early Effects of COVID-19 on Plastic Surgery Residency Training: The University of Washington Experience. Plast. Reconstr. Surg. 2020; 146(2):447-54.
33. Charbonneau H, Mrozek S, Pradere B, Cornu JN, Misrai V. How to resume elective surgery in light of COVID-19 post-pandemic propofol shortage: The common concern of anaesthesists and surgeons. Anaesth. Crit. Care Pain Med. 2020; 39(5):593-4.
34. Deora H, Mishra S, Tripathi M, Garg K, Tandon V, Borkar S, et al. Adapting Neurosurgery Practice During the COVID-19 Pandemic in the Indian Subcontinent. World Neurosurg. 2020; 142:e396-e406.
35. Wick EC, Pierce L, Conte MC, Sosa JA. Operationalizing the Operating Room: Ensuring Appropriate Surgical Care in the Era of COVID-19. Ann. Surg. 2020; 272(2):e165-e167.
36. Qazi SH, Saleem A, Pirzada AN, Hamid LR, Dogar SA, Das JK. Challenges to delivering pediatric surgery services in the midst of COVID 19 crisis: experience from a tertiary care hospital of Pakistan. Pediatr. Surg. Int. 2020; 36(11):1267-73.

37. Philouze P, Cortet M, Quattrone D, Céruse P, Aubrun F, Dubernard G, et al. Surgical activity during the Covid-19 pandemic: results for 112 patients in a French tertiary care center, a quality improvement study. Int. J. Surg. 2020; 80:194-201.
38. Sanmugam A, Vythilingam G, Singaravel S, Nah SA. Assess, adapt and act: a paediatric surgery division's initial approach in a rapidly evolving pandemic. Pediatr. Surg. Int. 2020; 36(8):925-31.
39. Anwar SL, Harahap WA, Aryandono T. Perspectives on how to navigate cancer surgery in the breast, head and neck, skin, and soft tissue tumor in limited-resource countries during COVID-19 pandemic. Int. J. Surg. 2020; 79:206-12.
40. Berardi G, Colasanti M, Sandri GBL, Basso CD, Ferretti S, Laurenzi A, et al. Continuing our work: transplant surgery and surgical oncology in a tertiary referral COVID-19 center. Updates Surg. 2020; 72(2):281-9.
41. Carmona M, Quintão VC, Melo BF, André RG, Kayano RP, Perondi B, et al. Transforming operating rooms into intensive care units and the versatility of the physician anesthesiologist during the COVID-19 crisis. Clinics (Sao Paulo, Brazil). 2020; 75:e2023err.
42. Argenziano M, Fischkoff K, Smith CR. Surgery Scheduling in a Crisis. N Engl J Med. 2020 Jun 4; 382(23):e87.
43. Rajan N, Joshi GP. COVID-19: Role of Ambulatory Surgery Facilities in This Global Pandemic. Anesth. Analg. 2020; 131(1):31-6.
44. Gallego MA, Casas SG, Migueláñez IP, Rubio-Pérez I, Serrano CB, Peña EA, et al. SARS-CoV-2 pandemic on the activity and professionals of a General Surgery and Digestive Surgery Service in a tertiary hospital. Impacto de la pandemia por SARS-CoV-2 sobre la actividad y profesionales de un Servicio de Cirugía General y del Aparato Digestivo en un hospital terciario. Cir. Esp (Engl Ed). 2020; 98(6):320-7.
45. Cai Y, Hao Z, Gao Y, Ping W, Wang Q, Peng S, et al. Coronavirus Disease 2019 in the Perioperative Period of Lung Resection: A Brief Report From a Single Thoracic Surgery Department in Wuhan, People's Republic of China. J. Thorac. Oncol. 2020; 15(6):1065-72.
46. Knihs NS, Valmorbida AP, Lanzoni GMM, Roza BA, Ghellere A. Caminho percorrido até a cirurgia cardíaca: necessidades e expectativas no pré-operatório. Av. Enferm. 2017; 35(1):30-41.
47. Patel SY, Mehrotra A, Huskamp HA, Uscher-Pines L, Ganguli I, Barnett ML. Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US. JAMA Intern. Med. 2021; 181(3):388-91.
48. Backes MTS, Higashi GDC, Damiani PDR, Mendes JS, Sampaio LS, Soares GL. Working conditions of Nursing professionals in coping with the Covid-19 pandemic. Rev. Gaucha Enferm. 2021; 42(spe):e20200339.
49. Sozutek A, Seker A, Kuvvetli A, Ozer N, Genc IC. Evaluating the feasibility of performing elective gastrointestinal cancer surgery during the COVID-19 pandemic: An observational study with 60 days follow-up results of a tertiary referral pandemic hospital. J. Surg. Oncol. 2021; 123(4):834-41.
50. Kawahara LT, Costa I, Barros C, Almeida GC, Bittar CS, Rizk SI. Cancer and Cardiovascular Diseases during the COVID-19 Pandemic. Câncer e Doenças Cardiovasculares na Pandemia de COVID-19. Arq. Bras. Cardiol. 2020; 115(3):547-57.
51. Erdem B, Gok M, Bostan S. The evolution of the changes in the clinical course: a multicenter survey-related impression of the ophthalmologists at the peak of the COVID-19 pandemic in Turkey. Int Ophthalmol. 2021;41(4):1261-9.
52. Colégio Brasileiro de Cirurgiões. Orientações para o retorno de cirurgias eletivas durante a pandemia de COVID19. Available from: https://cbc.org.br/wp-content/uploads/2020/05/PROPOSTA-DE-RETOMA-DA-DAS-CIRURGIAS-ELETIVAS-30.04.2020-REVISTO-CBCA-MIBSBASBOT-ABIH-SBI-E-DEMAIS.pdf
53. Poulose BK, Phieffer LS, Mayerson J, Like D, Forrest LA, Rahmanian A, et al. Responsible Return to Essential and Non-Essential Surgery During the COVID-19 Pandemic. J. Gastrointest. Surg. 2021; 25(5):1105-7.
54. Júnior AT, Vanhoni LR, Silveira SK, Marcolin AC. Childbirth, Puerperium and Abortion Care Protocol during the COVID-19 Pandemic. Rev. Bras. Ginecol. Obstet. 2020; 42(6):349-55.
55. Paes LBO, Salim NR, Stofel NS, Fabbro MRC. Women and COVID-19: reflections for a sexual and reproductive rights-based obstetric care. Rev. Bras. Enferm. 2021; 74(Suppl 1):e20201164.
56. Dal'Bosco EB, Floriano LSM, Skupien SV, Arcaro G, Martins AR, Anselmo ACC. Mental health of nursing in coping with COVID-19 at a regional university hospital. Rev. Bras. Enferm. 2020; 73 Suppl 2:e20200434.
57. Silva KCL, Lima MEG. A inserção de duas psicólogas residentes em tempos de COVID-19. Cadernos ESP/CE. 2020; 14(1):95-9.

58. Alshdaifat E, Sindiani A, Khasawneh W, Abu-Azzam O, Qarqash A, Abushukair H, et al. The impact of COVID-19 pandemic on training and mental health of residents: a cross-sectional study. BMC Med. Educ. 2021; 21(1):208.
59. Ossege CL, Santos OM, Franco ACD, Hoepfner NO, Carvalho DSB, Moraes GH, et al. Atuação do profissional de saúde residente no enfrentamento da covid-19: um relato de experiência da secretaria de estado de saúde do distrito federal. Cenas Educacionais. 2020; 3:e8489-e8489.
60. Savitsky B, Findling Y, Ereli A, Hendel T. Anxiety and coping strategies among nursing students during the covid-19 pandemic. Nurse Educ. Pract. 2020; 46:102809.
61. Luberto CM, Goodman JH, Halvorson B, Wang A, Haramati A. Stress and Coping Among Health Professions Students During COVID-19: A Perspective on the Benefits of Mindfulness. Glob. Adv. Health Med. 2020; 9:2164956120977827.

Original article

Promoting health literacy through the teach back method among Iranian health ambassadors: A randomized controlled trial

Ahmad Sotoudeh[1]
https://orcid.org/0000- 0001-9010-4628
Mojtaba Fattahi Ardakani[2]
https://orcid.org/0000- 0001-9989-171X
Mohammad Saeed Jadgal[3]
https://orcid.org/0000 -0002-2122-9782
Ali Asadian[4]
https://orcid.org/0000- 0001-8823-356X
Morad Ali Zareipour[5]
https://orcid.org/0000-0002-1039-896X

Promoting health literacy through the teach back method among Iranian health ambassadors: A randomized controlled trial

Abstract

Objective. Describe the effect the teach back method on promoting the health literacy of health ambassadors in Urmia County in 2020. **Methods.** In the present quasi-experiment, 200 persons over 14 years old participated. They were divided into two research groups, a control (n=100) and an intervention (n=100). The sampling method was simple randomization and the data collection instrument was a questionnaire comprised of demographic information and health literacy (HELIA). The educational intervention took 4 sessions each 45 minutes in length following the teach back method. The questionnaire-based data were collected once before the intervention and once again three months after the intervention. **Results.** The present findings showed that 54% of the control group and 50% of the intervention group had a good or very

1 Department of Public Health, Bushehr University of Medical Sciences, Bushehr, Iran.
Email: Sotoudeh_ahmad@yahoo.com
2 Diabetes Center Research, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.
Email: mjfattahi57@gmail.com
3 Department of Public Health, Iranshahr University of Medical Sciences, Chabahar, Iran.
Email: jadgal15@gmail.com
4 Social Determinants in Health Promotion Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.
Email: a.assadian.a@gmail.com
5 Department of Public Health, School of Health, Khoy University of Medical Sciences, Khoy, Iran
Email: z.morad@yahoo.com.
Corresponding Author: Morad Ali Zareipour

Conflicts of interest: None.

Receipt: 28 Jun, 2021.

Approved: March 3, 2022.

How to cite this article: Sotoudeh A, Ardakani MF, Jadgal MS, Asadian A, Zareipour MA. Promoting health literacy through the teach back method among Iranian health ambassadors: A randomized controlled trial. Invest. Educ. Enferm. 2022; 40(1):e17.

DOI: https://doi.org/10.17533/udea.iee.v40n1e17.

Investigación y Educación en Enfermería
–Nursing Research and Education–
Vol. 40 No.1, January-April 2022 • ISSNe: 2216-0280

good level of health literacy before the intervention($p>0.05$). However, after the intervention, 52% of the control and 78% of the intervention group had a good or very good level of health literacy. The present findings revealed that the mean scores of health literacy dimensions (access to information, reading, understanding, appraisal, decision-making) and the overall health literacy score were significantly higher in the intervention group than the control (after the intervention). Wilcoxon's test results showed that the mean difference of the overall health literacy scores and the dimensions before and after the intervention were statistically significant ($p<0.001$). **Conclusion.** In the light of the present findings, we can conclude that participatory methods and the teach back method can improve health literacy, acquire reliable information and adopt healthy behaviors.

Descriptors: health literacy, teach-back communication, access to information, health behavior.

Promoción de la alfabetización en salud mediante el método teach-back entre los embajadores de la salud iraníes: Un ensayo controlado aleatorio

Resumen

Objetivo. Describir el efecto del método teach-back en la promoción de la alfabetización en salud de los embajadores de la salud en el condado de Urmia, Irán en 2020**.** **Métodos.** En el presente estudio cuasiexperimental participaron 200 personas mayores de 14 años. Mediante muestreo de aleatorización simple se asignaron los grupos de investigación: de control ($n=100$) y de intervención ($n=100$). Se empleó un instrumento para la recogida de datos que contenía información demográfica y el instrumento *Health Literacy for Iranian Adults* –HELIA-. La intervención educativa consistió en 4 sesiones de 45 minutos, siguiendo el método teach- back. Los datos basados en el cuestionario se recogieron antes de la intervención y tres meses después de la misma. **Resultados.** Los hallazgos mostraron que el 54% del grupo de control y el 50% del grupo de intervención tenían un nivel bueno o muy bueno de conocimientos sobre alfabetización en salud antes de la intervención ($p>0.05$). Sin embargo, después de la intervención, el 52% del grupo de control y el 78% del grupo de intervención tenían un nivel bueno o muy bueno de conocimientos sanitarios. Los presentes resultados revelaron que las puntuaciones medias de las dimensiones de la alfabetización en salud *acceso a la información, lectura, comprensión, valoración, toma de decisiones* y de la puntuación global fueron significativamente mayores en el grupo de intervención que en el de control a los 3 meses después de la intervención. Finalmente, los resultados de la prueba de Wilcoxon mostraron que la diferencia media de las puntuaciones de la alfabetización en salud y de las dimensiones antes y después de la intervención eran estadísticamente significativas ($p<0.001$). **Conclusión.** A la luz de los resultados, se pudo concluir que la aplicación del método teach-back puede mejorar los conocimientos sobre la alfabetización en salud, además de ayudar a adquirir información fiable y a adoptar comportamientos saludables.

Descriptores: alfabetización en salud, método teach-back, acceso a la información, conductas relacionadas con la salud.

Promoção da alfabetização em saúde mediante o método teach-back entre os embaixadores da saúde iranianos: Un ensaio controlado aleatório

Resumo

Objetivo. Descrever o efeito do método teach-back na promoção da alfabetização em saúde dos embaixadores da saúde no condado de Urmia, Irã em 2020. **Métodos.** No presente estudo quase-experimental participaram 200 pessoas maiores de 14 anos. Mediante amostragem de aleatória simples foram designados aos grupos de investigação: de controle ($n=100$) e de intervenção ($n=100$). Se empregou um instrumento para o recolhimento de dados que continha informação demográfica e o instrumento Health Literacy for Iranian Adults –HELIA-. A intervenção educativa consistiu em 4 sessões de 45 minutos, seguindo o método teach- back. Os dados baseados no questionário se recolheram antes da intervenção e três meses depois dela. **Resultados.** As descobertas mostraram que 54% do grupo de controle e 50% do grupo de intervenção tinham um nível bom ou muito bom de conhecimentos sobre alfabetização em saúde antes da intervenção ($p>0.05$). Porém, depois da intervenção, 52% do grupo de controle e 78% do grupo de intervenção tinham um nível bom ou muito bom de conhecimentos sanitários. Os presentes resultados revelaram que as pontuações médias das dimensões da alfabetização em saúde *acesso à informação, leitura, compreensão, valoração, toma de decisões* e da pontuação global foram significativamente maiores no grupo de intervenção que no de controle aos 3 meses depois da intervenção. Finalmente, os resultados da prova de Wilcoxon mostraram que a diferença média das pontuações da alfabetização em saúde e das dimensões antes e depois da intervenção eram estatisticamente significativas ($p<0.001$). **Conclusão.** À luz dos resultados, se pôde concluir que a aplicação do método teach-back pode melhorar os conhecimentos sobre a alfabetização em saúde, além de ajudar a adquirir informação confiável e a adotar comportamentos saudáveis.

Descritores: letramento em saúde, comunicação para apreensão de informação, acesso à informação, comportamentos relacionados com a saúde.

Introduction

Health literacy is a major moderator in the effectiveness of health education interventions.(1) Health education and healthliteracy are correlated. In other words, health literacy is a main consequence of health education interventions, but implementing health literacy interventions regardless of the perceived health literacy adversely affects the effectiveness and benefits of these interventions.(2) Health literacy refers to the ability to obtain, process and understand basic health information and services to decide appropriately on health issues. It includes the skills of reading, hearing and analyzing health information, making appropriate health decisions and being able to use these skills in health-related conditions.(3,4) Moreover, low health literacy is a barrier to participation in health education programs.(3) A body of related literature showed that a good level of health literacy can increase the effectiveness of health promotion programs and can improve individuals' health.(3) Educating people in society is a time-consuming task in health services. It is recommended to explore the effectiveness of different educational methods in this regard.(5) Effective education requires the use of educational methods whose effectiveness is already proven. Among them is the evidence-based teach back method, a comprehensive multi-dimensional method used to obtain and retain information. It is also considered an interactive educational method in which the learner should develop the skills of obtaining and using the instructed information. This method also reduces the risk of misunderstanding the essential information an individual needs in risky conditions.(6)

This method takes into account participation, cooperation, social acceptance and recall. The learner is expected to develop the required skills of teaching what s/he has already learned. The distinctive feature of this method is that the effectiveness of what the learner manages to teach shows his/her efficiency and the effectiveness of instructions.(7) Another benefit of this method is self-appraisal. That is to say that before anyone else judges the quality of instructions, the learner him/herself does so. Therefore, this method has a corrective and re-educational feature.(8) In their research, Oshvandi et al. reported the effectiveness of the teach back method in promoting self-care behaviors in patients with diabetes type 2.(9)

Promoting health literacy is the greatest hope for decreasing the load of diseases and mortalities worldwide. Promoting health literacy can improve self-care and life quality, optimal use of health services and, thus, reduce health costs.(2) Therefore, since the health ambassador comprehensive plan was implemented in urban and rural healthcare centers, health ambassadors have been considered as the main educators in families. Health ambassadors are volunteers selected from households receiving services from healthcare centers. They might be students or working members of society who acquire health-related knowledge and transfer it to other family members and the community to which they belong.(10) Empowering family health ambassadors as elected representatives will be effective in promoting health literacy through the teach back method. Because with this training method, health ambassadors will learn health literacy materials in their own language and will easily transmit these learned materials in their own language to family members and thus will promote family health. Considering the distinctive features of the teach back method, the present research aimed to explore the effect of this method on promoting health ambassadors' health literacy in Urmia County in 2020.

Methods

The present clinical trial used randomization in both research groups. It was quasi-experimental in type and was conducted in Urmia County in Iran in 2020. The sample size was determined in the light of the existing literature(11) using G-Power, an effect size of 40%, a standard deviation of 30.5±2.8 and 19.27±3.3 for the first and second groups respectively, a confidence interval of 95% , a test power of 80% and a 10% attrition rate for each group. The final sample size was estimated at 100. For the sampling, firstly, Urmia County was divided into the north and the south parts. Among the healthcare centers in each part, 10 were randomly selected and were further randomly divided into two groups (*n*=5) as the control and intervention. In the next step, among the list of health ambassadors' names, 20 were selected from each center through simple randomization.

Being a health ambassador according to the national protocol (a person from each household who has at least Sixth elementary), having a health ambassador file in the center and health center, satisfaction with attending the study were the criteria for inclusion in the study.

The data were collected using a questionnaire in two parts. The first part enquired about the respondents' demographic information (age, education, occupation, …) and the second part was HELIA, exploring the health literacy along five dimensions (reading, access to information, understanding, appraisal, health decisions/ behavior) with 33 items. The raw scores of the 5 dimensions were then turned into a standard score ranging from 0 to 100. A score of 0-50 was interpreted as very poor, 50.1-66 as poor, 66.1-84 as good and 84.1-100 as very good health literacy. The psychometrics of this questionnaire were measured by Montazeri *et al.* and the validity was substantiated.(12) The validity of the HELIA questionnaire was confirmed using content validity. Reliability was also confirmed by calculating Cronbach's alpha coefficient (□=88).

Those who met the inclusion criteria entered the study. In order to prevent knowledge transfer between the two research groups, the health ambassadors of 5 healthcare centers were assigned to the control and 5 others to the intervention group. They were then contacted through phone calls to participate in the research. The purpose of study was revealed and an informed letter of consent was signed. The participants were asked to come again on certain dates as planned. At first, the pretest questionnaire was completed through an interview by the researcher and then the educational program was run in 4 sessions (each 45 minutes long) to teach health literacy (25 minutes of education, 20 minutes of teach back). The educational content of each session was taught face to face to health ambassadors through the teach back method along with a training using reliable sources. The ambassadors were then asked to recite the educational content in their own language. If the content showed not to be correctly understood by the health ambassador, the content was taught again. (Table 1).

Table 1. Summary of Educational Content of Health Literacy Intervention Group Sessions in Health Ambassadors by Teach-Back Method

Sessions	Educational content
First Session	**Educational topic title:** ***Reading*** Familiarity of ambassadors with the objectives of the research, familiarity with reading educational materials on health, reading written instructions of doctors, dentists and health workers about diseases, reading medical and dental forms (such as patient admission form, consent form, file formation, etc. in hospitals and Medical centers), reading the instructions in the handbook and preparation before the examination, ultrasound or radiology.
Second Session	**Educational topic title:** ***Access to information*** Familiarity with the principles of access to information on healthy eating, mental health, chronic diseases, infectious diseases, harms and dangers of smoking.
Third Session	**Educational topic title:** ***Understanding, appraisal*** Familiar with the meaning and concept: Materials written in medical and dental forms, signs and materials written on billboards in hospitals and clinics, how to use drugs and instructions for taking drugs, contents written in the guide sheet before the test, ultrasound or radiology.
Fourth Session	**Educational topic title:** ***Health decisions/behavior*** - Familiarity with how to properly assess the information provided related to health on the Internet, television and radio, friends and relatives. - Avoid doing things or consuming substances that endanger your health. - Perform annual check-ups (periodic examinations) to assess health - Use a seat belt while driving - Take care of your health in any job and situation

Before the educational intervention, the data were collected from both research groups via the questionnaires and then the educational intervention was performed for the intervention group by TB method and for the control group, routine education was performed and Questionnaires for both groups were completed again after 3 months of education. To analyze the data in SPSS19 and compare the mean scores of the dimensions of health literacy in the pre- and post-tests in each group, paired-samples *T*-test was run. For between-group comparison, independent-samples *T*-test was run. The inclusion criteria were: being a health ambassador based on the national protocol (a literate household member with at least a junior high school degree), having a health ambassador's record in the healthcare center and willingness to participate in the research.

Results

In the present research, 200 health ambassadors participated, half in the intervention group (*n*=100) and half in the control (*n*=100). The mean and standard deviation of the participants' age in the intervention and control groups were 37.35±9.57 and 38.45±9.78 years, respectively. No statistically significant difference was found between the control and intervention groups in terms of age, sex, education, marital status and occupation. Thus, the two groups were homogeneous (Table 2).

The present findings showed that 54% of the control group and 50% of the intervention group enjoyed a good or very good level of health literacy in the pretest. However, in the posttest, 52% of the control and 78% of the intervention group had good or very good health literacy (Table 3).

Table 2. Comparison of demographic variables between the intervention and control groups

Variable		Intervention group *n* (%)	Control group *n* (%)	*p*-value
Age	15-25	9 (9)	8 (8)	0.37
	25-35	37 (37)	39 (39)	
	35-45	33 (33)	33 (33)	
	46 +	21 (21)	20 (20)	
Sex	Male	24 (24)	25 (25)	0.17
	Female	76 (76)	75 (75)	
Marital status	Single	12 (12)	13 (13)	0.08
	Married	86 (86)	84 (84)	
	Divorced/widowed	2 (2)	3 (3)	
Occupation	Housewife	42 (42)	44 (44)	0.13
	Clerk	54 (54)	51 (51)	
	Freelance	4 (4)	5 (5)	
Education	Junior high school	42 (42)	39 (39)	0.09
	Diploma	39 (39)	43 (43)	
	Academic degree	19 (19)	18 (18)	

Table 3. Comparison of health literacy between the intervention and control groups in the pre- and post-test

Variable	Level	Control *n* (%)	Intervention *n* (%)
Health literacy in pre-test	Very poor	27 (27)	23 (23)
	poor	23 (23)	25 (25)
	Good	28 (28)	27 (27)
	Very good	22 (22)	25 (25)
Health literacy in the post-test	Very poor	22 (22)	7 (7)
	Poor	24 (24)	15 (15)
	Good	30 (30)	29 (29)
	Very good	24 (24)	49 (49)

The present findings showed that the mean scores of all dimensions of health literacy (access to information, reading, understanding, appraisal, decision making) and the total health literacy score were increased in the intervention group in the post-test. Wilcoxon's test results showed that the mean difference of the total health literacy score and the dimensions between the pre- and post-test were statistically significant ($p<0.05$).

The mean health literacy score was increased after the intervention. However, no statistically significant difference was found within the control group in the pre- and post-test ($p<0.05$). Mann-Whitney *U*-test revealed no statistically significant difference between the control and intervention group in the pre-test. Yet, the between-group difference in the post-test was statistically significant for the overall health literacy and the dimensions of health literacy (Table 3).

Table 3. Comparison of the mean health literacy scores in the two research groups in the pre- and post-test

Variable		Pre-test	Post-test	
Health literacy dimension	**Group**	**mean±SD**	**mean±SD**	***p*-value**
Access to information	Intervention	12.82±3.80	13.63±4.89	<0.001
	Control	12.54±3.14	12.34±4.11	0.81
	p-value	0.57	< 0.001	
Reading	Intervention	10.62±3.39	14.82±3.37	<0.001
	Control	11.52±3.52	12.02±3.58	0.49
	p-value	0.83	<0.001	
Understanding	Intervention	11.75±4.31	13.86±5.91	<0.001
	Control	11.01±3.89	12.04±3.22	0.087
	p-value	.37	<.001	
Appraisal	Intervention	15.48±3.48	19.18±3.53	<0.001
	Control	15.1±3.51	15.84±3.51	0.2
	p-value	0.14	0.001	
Decision-making	Intervention	21.39±7.05	23.56±8.83	<0.001
	Control	21.78±6.05	22.02±6.05	0.06
	p-value	0.13	<0.001	
Total health literacy	Intervention	58.97±18.52	69.13±22.74	<0.001
	Control	57.77±17.54	58.76±18.41	0.1
	p-value	0.3	<0.001	

Discussion

The present research aimed to explore the effect of the teach back method on health ambassadors' health literacy in Urmia County. The findings revealed that educating through the teach back method can improve health literacy and promote preventive behaviors, an evidence for the effectiveness of the educational content in promoting health literacy. The mean health literacy score was significantly increased in the intervention group in the post-test. The difference between the mean health literacy score of the two groups was also statistically significant after the intervention. These findings are consistent with a body of research by Tal et al., Mirzaei et al. and Eftekhari *et al.*(14-15) these researchers showed that education can increase the level of health literacy, and that poor health literacy can be promoted through health education. As for the potential factors accounting for the rise of health literacy, it can be concluded that health literacy, similar to awareness, is a cognitive construct and poor health literacy is a definite concept of a low awareness of how to access information and then appraise it and decide on it to show the healthy behavior. In many educational methods, information is provided to different populations superficially with minor effects on the audience's knowledge. Limited knowledge cannot empower an individual systematically. Low power impedes the occurrence of any controversial issue to the individual. Eventually, s/he cannot tell apart what is right and wrong.(16)

The present research also showed an increase in the number of participants with a good or very good level of health literacy in the intervention group in the post-test, which proves the effectiveness of the educational intervention. Thus, an educational intervention appropriate for the participants can increase the level of health literacy and the teach back method can be considered an effective and appropriate method.(17) The present findings also showed a statistically significant increase in the level of health literacy in the intervention group after the teach back method. Therefore, a greater awareness and knowledge of the principles of healthy lifestyle can enable people to know their environment and the existing health resources better. Promoting health literacy can be considered a main predictor of an improved health condition.(18,19) Moreover, after the educational intervention, there was a statistically significant increase in the mean understanding score of the intervention group compared to the control. Similarly, Smith et al. reported a more positive appraisal of the information resources than the control, and also a better understanding of the health information. (20) Kahtari et al. reported a higher mean score of understanding (a dimension of health literacy among female students after the educational intervention).(18)

The present research showed that the educational intervention managed to increase the mean scores of the dimensions of health literacy and decision-making. Many members of the society are faced with different types of health-related information some of which are neither accurate nor reliable.(21) Using unreliable information is considered a risk factor. Yet many people resort to these unreliable information sources and put their life and health at risk.(22) As defined by Nutbeam,(23) the critical health literacy concept is associated with a high level of recognition and social skill and is necessary for data analysis. Therefore, increasing the level of health literacy especially in appraisal and decision-making can affect individuals' correct or incorrect analysis of information and appraisal of the quality and reliability of information. A good level of critical health literacy can be effective in the qualitative appraisal of health information especially weblogs and social media.(24,25) Furthermore, an increase in health literacy can be followed by a higher self-efficacy in different dimensions of health literacy and health consequences such as life quality.(26,27)

In the light of the present findings, we can also conclude that health literacy is a combination of a wide range of skills, capabilities and competencies in acquiring medical or health-related information, reading this information, understanding or interpreting it and sometimes making decisions on or applying this information. This is how health literacy can affect the adoption of preventive behaviors. In other words, through increasing the understanding and appraisal of the benefits of diagnostic and preventive behaviors, health literacy can be an effective factor involved in adopting these behaviors. Considering the positive effect of teach back method education method and considering the increasing growth of chronic diseases and the special role of nurses in educating and promoting community health literacy, it seems necessary to pay attention to this educational method. Nurses can be very effective in reducing adverse outcomes and promoting health by using this method. The use of this educational method as part of nurses' activities is recommended to reduce the problems of people in the community, especially health ambassadors.

One of the limitations of this study was the possibility of obtaining information while conducting research from other information sources (family members and media) other than the researcher's training in both control and intervention groups, which was beyond the control of the researcher.

Conclusion. The present findings revealed that implementing dynamic educational methods, which involves human cooperation, could improve self-care and health literacy. They can also result in the selection of reliable information and healthy behaviors. Thus, using this educational model by the educational groups can contribute to the promotion of health literacy in practice. This model is suggested as a sociological approach to the health system to improve self-care behaviors and health indices.

Acknowledgements. The ethics committee of Urmia University of medical sciences (#IR.UMSU.REC.1398.430) approved the present research. The authors should like to express their gratitude to all the participants.

References

1. Asadian A, Sotoudeh A, Zarei Venovel M, Moosai R. Investigating health literacy of teachers in Asaluyeh. J. Health Soc. Behav. 2018; 10(2):234-28.
2. Zareipour M, Saeed Jadgal M, Khazir Z, Moradi Z, Amirzehni J. Study of Lifestyle and Its Relationship Between Health Literacy in Health Ambassadors in Urmia. J Health Lit. 2021; 2(6): 33-40.
3. Eckman MH, Wise R, Leonard AC, Dixon E, Burrows C, Khan F, et al. Impact of health literacy on outcomes and effectiveness of an educational intervention in patients with chronic diseases. Patient Educ. Couns. 2012; 87(2):143-51.
4. Tehrani Banihashemi SA, Amirkhani MA, Haghdoost AA, Alavian SM, Asgharifard H, Baradaran H, et al. Health literacy and the affecting factors: A study in five provinces of Iran, strides in development of medical education. JMED. 2007; 4(1):1-9.
5. Azizi HR, Yousefian Miandoab N, Yaghoubinia F. The effect of Teach-Back education on readmission in patients with acute coronary syndrome. Crit. Care Nurs. 2020; 13(2):14-21.
6. Centrella-Nigro AM, Alexander C. Using the teach-back method in patient education to improve patient satisfaction. J. Contin. Educ. Nurs. 2017;48(1):47-52.
7. Dave S, Chakravorty I, Menon G, Sidhu K, Bamrah JS, Mehta R. Differential Attainment in Summative Assessments within Postgraduate Medical Education & Training. Sushruta J. Health Policy Opinion. 2020;13(3).

8. Yen PH, Leasure AR. Use and effectiveness of the teach-back method in patient education and health outcomes. Fed. Pract. 2019; 36(6):284.
9. Oshvandi K, Jokar M, Khatiban M, Keyani J, Yousefzadeh MR, Sultanian AR. The effect of self-care education based on teach back method on promotion of self-care behaviors in type ii diabetic patients: a clinical trial study. Iran J. Diabetes Metab. 2014; 13(2):131-43.
10. Zareipour M, Fattahi Ardakani M, Sotoudeh A, Tasouji Azari M. The Importance of Tele Education of Family Health Ambassadors in COVID -19 Prevention. J Health Lit. 2021; 1(6): 9-12.
11. Shayesteh H, Mansoriyan M, Mirzaie A, Sayehmiri K. Survey of the effect of educational intervention on the nutrition physical activity and stress management of patients with hypertension among the rural population of Aligoudarz County of Lorestan Province in 2015. J. Ilam Univ. Med. Sci. 2016; 24(2):54-62.
12. Montazeri A, Tavousi M, Rakhshani F, Azin SA, Jahangiri K, Ebadi M, et al, Sistani MM. Health Literacy for Iranian Adults (HELIA): development and psychometric properties. Payesh. 2014; 13(5):589-99.
13. Tol A, Pourreza A, Foroshani R, Tavassoli E. Assessing the effect of educational program based on small group on promoting knowledge and health literacy among women with type2 diabetes referring to selected hospitals affiliated to Tehran University of Medical Sciences. RJMS. 2013; 19:(104).
14. Mirzaei A, Ramezankhani A, Taheri Tanjani P, Ghaffari M, Jorvand R, Bazyar M, et al. The effectiveness of health literacy based educational intervention on nutritional outcomes of elderly. Iran. J. Ageing. 2020; 15(3):324-37.
15. Jahani Eftekhari M, Peyman N, Doosti H. The Effect of Educational Intervention based on the Self Efficacy and Health Literacy Theory on Health Promoting Lifestyles among Female Health Volunteers of Neyshabur, Iran. Health Dev. J. 2020; 6(4):302-13.
16. Fattahi Ardakani M, Sotoudeh A. Inadequate Health Literacy and the Role of Cyberspace in the Tendency to Use Alcohol in the Prevention of Coronavirus. Int. J. High. Risk. Behav. Addict. 2021; 10(1).
17. Jacobs RJ, Caballero J, Ownby RL, Kane MN. Development of a culturally appropriate computer-delivered tailored Internet-based health literacy intervention for Spanish-dominant Hispanics living with HIV. BMC Med. Inform. Decis. Mak. 2014; 14(1):1-10.
18. Kahtari M, Farmanbar R, Kasmaei P, Omidi S. The effect of the educational intervention on health literacy level in the girl students. J. Health Lit. 2017; 2(3):187-97.
19. Nutbeam D, Levin-Zamir D, Rowlands G. Health literacy and health promotion in context. SAGE Publications Sage UK: London, England; 2018.
20. Smith CA, Chang E, Gallego G, Khan A, Armour M, Balneaves LG. An education intervention to improve decision-making and health literacy among older Australians: a randomised controlled trial. BMC Geriatr. 2019; 19(1):1-12.
21. Chen X, Hay JL, Waters EA, Kiviniemi MT, Biddle C, Schofield E, et al. Health literacy and use and trust in health information. J. Health Commun. 2018; 23(8):724-34.
22. Chinn D. Critical health literacy: A review and critical analysis. Soc. Sci. Med. 2011; 73(1):60-7.
23. Nutbeam D. The evolving concept of health literacy. Soc. Sci. Med. 2008; 67(12):2072-8.
24. Nutbeam D. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health Promot. Int. 2000; 15(3):259-67.
25. Schaller S, Marinova-Schmidt V, Setzer M, Kondylakis H, Griebel L, Sedlmayr M, et al. Usefulness of a tailored eHealth service for informal caregivers and professionals in the dementia treatment and care setting: the eHealth Monitor Dementia Portal. JMIR Res. Protoc. 2016; 5(2): 4354.
26. Kharazi SS, Peyman N, Esmaily H. Effect of an educational intervention based on self-efficacy theory and health literacy strategies on pregnancy outcomes: a randomized clinical trial. IJOGI. 2018; 21(5):33-46.
27. Akhlaghi M, Ranjbar H, Abedinzadeh MR, Ahmadi A. Comparative study of two methods of fluid therapy with Ringer's Lactate and Ringer's solution. MUMS. 2018; 61(1):888-99.