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–Nursing Research and Education–

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Editorial

Are Nursing Students Trained to Meet the Needs of Cancer Survivors and Their Families? New Challenges, New Opportunities

Cristina García-Vivar[1]
Virginia La Rosa-Salas[2]
Marta Domingo-Oslé[3]

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Current cancer treatments, along with more effective prevention measures, are producing increased cancer survival globally;[1] becoming – in many cases – a chronic disease.[2] Care of patients and families, living with a chronic disease, like cancer, constitutes one of the principal challenges for most health systems because they represent a heavy burden in terms of morbidity and mortality and carry a high percentage of the public expenditure in health.[3] Above all, the impact of cancer entails suffering and represents an important limitation in the quality of life, productivity, and functional state of the sick individuals and those living with them, that is, their family. More so, with evidence of the progressive increase of the number of older people with cancer, who are more prone to having comorbidities and other problems associated with their age, like dementia, depression, cerebrovascular accident, and diabetes.[4]

This new health context is influencing upon the setting where health care takes place. Thus, there is a need for Nursing and nurses to develop new ways of working that include innovative roles and profiles, greater openness

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of care approaches,[5] as well as the opportunity to demonstrate greater leadership in health services and, thereby, contribute to responding to current health challenges; among them, the challenge of chronicity and family-centered care.[6] In parallel manner, the new professional context is influencing on the formation of future health professionals, also in the setting of cancer care, as indicated by different national and European scientific societies on oncology.[7,8] Within these changing health, professional, and academic contexts, this editorial seeks to become a space for reflection, which highlights the training needs and acquisition of skills for nursing students, converted into health professionals, to care for cancer patients and their family members, not only during acute moments of the disease but throughout the different stages of cancer and with a comprehensive approach centered on the person and family.

Graduating students face a living, changing society with projection, which is why abilities and skills should be developed that permit them to synchronize their own theoretical knowledge as support of their clinical practice. However, how are these future nursing professionals being prepared to care for cancer survivors and their families? Where are the unique view and contribution by the nursing discipline to respond to the specific needs of these individuals? In Europe, the academic world, framed within the European Higher Education Area, faces the change of paradigm from a traditional approach of teacher-centered teaching to student-centered teaching. According to Miguel Díaz,[9] only thus is responsibility assumed on the training and development of their academic work. Thus, graduating students, future health professionals, will develop the necessary skills to "learn to learn" and, thereby, have the capacity to develop the skills they need for their dynamic work and guarantee continued education.

Given the complexity of oncology care, not only physical care, but psychosocial care inherent to the experience of living with cancer, it is vitally important to enhance nursing education in oncology. Enhancement based on introducing into the Nursing curriculum a set of innovative methodological strategies coherent with the results of learning sought, so that future nursing professionals obtain the knowledge and necessary skills to respond to the needs faced by people living with cancer. Namely, physical needs, such as management of pain, fatigue, or nausea and psychosocial needs, like management of fear and uncertainty, anxiety and depression, work and economic impact, interpersonal relationships and family communication and functioning, among others.[10] For significant learning by students that provide them the necessary tools to address the cited health needs, a variety of educational methodologies must be used, such as case studies, problem-based learning, project-based learning, cooperative learning, or the expository method or magisterial lesson. Also needed are more innovative evaluation methodologies, like the approach and resolution of clinical cases, simulation, or structured objective clinical evaluation. Likewise, participation is necessary from graduating students in the clinical practice in day centers, hospitals, and primary health care for long-term follow-up of cancer survivors.

Lastly, identification of educational methodologies for significant student learning is closely related with nursing research on education. In this sense, we indicate the importance of educational decisions being based on the best evidence available to guarantee that future alumni have acquired the skills to care for patients and families living with cancer. The strength of nursing research lies in considering it an important tool to improve the clinical practice, but also as an asset to construct new frameworks of educational knowledge in benefit of student training to meet the health needs of society.

We have new challenges and many opportunities in nursing research and education!

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Quality of Nurses' Communication with Mechanically Ventilated Patients in a Cardiac Surgery Intensive Care Unit

Original article

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Quality of Nurses' Communication with Mechanically Ventilated Patients in a Cardiac Surgery Intensive Care Unit

Abstract

Objective. To describe the quality of the relationship between nurses and patients under mechanical ventilation. **Methods.** This observational study, performed in a cardiac surgery intensive care unit in Iran, selected 10 nurses and 35 patients through simple random and convenience sampling, respectively. One of the researchers observed 175 communications between nurses and patients in different work shifts and recorded the results according to a checklist. Nurse and patient satisfaction with the communication was assessed by using a six-item Likert scale, 8 to 12 h after extubation. **Results.** Most of the patients were male (77.1%), while most of the nurses were female (60%). Patients started over 75% of the communications observed. The content of the communication was related mostly to physical needs and pain. Besides, the majority of patients used purposeful stares and hand gestures, and head nod for communication.

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Most of the communications between patients and nurses were satisfied 'very low' (45.7% in nurses, versus 54.3% in patients). However, 'complete satisfaction' was lower in nurses (0%), compared with patients (5.7%). No statistically significant correlation was found between patients' and nurses' satisfaction and demographic variables. **Conclusion.** The results showed that communication between nurses and mechanically ventilated patients was built through traditional methods and was based on the patients' requests. This issue might be the cause of an undesirable level of their satisfaction with the communication, given that effective communication can lead to understanding and meeting the needs of the patients.

Descriptors: non-verbal communication; ventilators, mechanical; cardiac care facilities; patient satisfaction; intensive care units.

Calidad de la comunicación de las enfermeras con pacientes ventilados mecánicamente en una Unidad de Cuidados Intensivos de Cirugía Cardíaca

Resumen

Objetivo. Describir la calidad de la relación entre las enfermeras y los pacientes sometidos a ventilación mecánica. **Métodos.** Estudio observacional realizado en una Unidad de Cuidados Intensivos de Cirugía Cardíaca en Irán. Se seleccionaron 10 enfermeras y 35 pacientes mediante muestreo aleatorio simple y de conveniencia, respectivamente. Se observaron 175 comunicaciones entre las enfermeras y los pacientes en diferentes turnos de trabajo. Los resultados se registraron de acuerdo con una lista de verificación. La satisfacción con la comunicación de las enfermeras y de los pacientes se evaluó mediante una escala Likert de 6 ítems, de 8 a 12 horas después de la extubación del paciente. **Resultados.** La mayoría de los pacientes eran hombres (77.1%), mientras que en las enfermeras predominó el sexo femenino (60%). El 75% de las comunicaciones observadas las iniciaron los pacientes. El contenido de la comunicación estaba relacionado principalmente con las necesidades físicas y el dolor. La mayoría de los pacientes usaron las miradas intencionadas, los gestos con las manos y los movimientos de la cabeza para comunicarse. La mayoría de las comunicaciones fueron 'ligeramente satisfactorias' (45.7% para enfermeras versus 54.3% para pacientes). Sin embargo, la satisfacción general fue menor en las enfermeras (0%) en comparación con los pacientes (5.7%). No se encontró correlación estadísticamente significativa entre la satisfacción de los pacientes y de las enfermeras con las variables demográficas estudiadas. **Conclusión.** Los resultados mostraron que la comunicación entre las enfermeras y los pacientes con ventilación mecánica se construyó a través de métodos tradicionales y se basó en las

solicitudes de los pacientes. Esta situación puede ser el motivo del nivel indeseable de satisfacción con las comunicaciones, las cuales son esenciales para comprender y satisfacer las necesidades de los pacientes.

Descriptores: comunicación no verbal; ventiladores mecánicos; instituciones cardiológicas; satisfacción del paciente; unidades de cuidados intensivos.

Qualidade da comunicação das enfermeiras com pacientes ventilados mecanicamente em uma Unidade de Tratamento Intensivo de Cirurgia Cardíaca

Resumo

Objetivo. Descrever a qualidade da relação entre as enfermeiras e os pacientes submetidos a ventilação. Métodos. Estudo observacional realizado em uma Unidade de Tratamento Intensivo de Cirurgia Cardíaca no Irã. Se selecionaram 10 enfermeiras e 35 pacientes mediante amostra aleatória simples e de conveniência, respectivamente. Se observaram 175 comunicações entre as enfermeiras e os pacientes em diferentes turnos de trabalho. Os resultados se registraram de acordo com uma lista de verificação. A satisfação com a comunicação das enfermeiras e dos pacientes se avaliou mediante uma escala Likert de 6 itens, de 8 a 12 horas depois da extubação do paciente. Resultados. A maioria dos pacientes eram homens (77.1%), enquanto que nas enfermeiras predominou o sexo feminino (60%). 75% das comunicações observadas foram iniciadas pelos pacientes. O conteúdo da comunicação estava relacionado principalmente com as necessidades físicas e a dor. A maioria dos pacientes para comunicar-se usavam as olhadas intencionadas, os gestos com as mãos e os movimentos da cabeça. A maioria das comunicações foram 'ligeiramente satisfatórias' (45.7% para enfermeiras versus 54.3% para pacientes). Porém, a satisfação completa foi menor nas enfermeiras (0%) em comparação com os pacientes (5.7%). Não se encontrou correlação estatisticamente significativa entre a satisfação dos pacientes e das enfermeiras com as variáveis demográficas. Conclusão. Os resultados mostraram que a comunicação entre as enfermeiras e os pacientes com ventilação mecânica se construiu através de métodos tradicionais e se baseou nas solicitações dos pacientes. Esta situação pode ser o motivo do nível indesejável de satisfação com as comunicações, as quais são necessárias para compreender e satisfazer as necessidades dos pacientes.

Descritores: comunicação não verbal; ventiladores mecânicos; institutos de cardiología; satisfação do paciente; unidades de terapia intensiva.

Introduction

Quality of Life (QoL) is defined as life conditions and satisfaction, which encompasses physical, psychological, social, and spiritual aspects. Interpersonal relationship is considered an important part of social aspects of QoL.[1] Effective communication is a basic part of qualified nursing care and is an important factor in playing an appropriate nursing role[2] in intensive care units (ICU), where the hospitalization experience is unpleasant.[3] Communication is an important factor to assess pain and other symptoms and for patients to participate in treatment decisions.[4] Some patients admitted to ICU are not able to speak and have difficulty communicating due to mechanical ventilation.[5] This problem can lead to anxiety, depression,[6] fatigue, frustration, hopelessness, and loss of control.[7] Some studies have also reported patient frustration and alienation due to failure in the communication process.[8,9] Evidence has also shown that in case patients are unable to express their symptoms, pain levels, and needs verbally, nurses will feel frustrated.[10]

Despite nurses' high levels of knowledge and skills, they frequently confront problems in communicating with patients in ICU.[10] Additionally, many nurse-patient communications are task-oriented and aim at meeting patients' immediate physical needs and performing clinical care.[11] Nevertheless, many studies have highlighted the importance and necessity of setting up communication between nurses and patients under mechanical ventilation. Researchers reported that critical care nurses devoted little time to communicating with their patients.[12] Difficulty in and failure of communication that reduces the amount of communication is mainly due to the inability to communicate verbally. When patients cannot respond to verbal communications, nurses do not often value talking with them, and interaction between nurses and patients will be based on the nurses' ideas, assumptions, and previous notions about patients' non-verbal behaviors.[10]

Ineffective communication can lead to patient and nurse dissatisfaction. The findings from a research on intubated patients' satisfaction with methods of communicating with nurses showed that patients in a non-intervention group had low and high satisfaction levels.[13] Because nurses are among the most important part in communicating with patients,[14] they should pay attention to patients who try to communicate non-verbally.[15] Regarding the importance of the problems caused by communication failure and physical, mental, and spiritual needs of mechanically ventilated patients, this could have a negative impact on their recovery and might cause discomfort.[6] In studies conducted in Iran, barriers to the relationship between nurses and patients in cardiac surgery wards or mechanically intubated patients' experiences have been investigated.[16,17] However, the quality of this relationship has not been particularly addressed in patients undergoing cardiac surgery and who were under mechanical ventilation. In other words, although the importance of

communication between nurses and mechanically ventilated patients is obvious, little information is available regarding the quality of the current situation in ICU in Iran. Without this information, it will be difficult to define appropriate evidence-based standards for patients admitted to ICU without the ability to speak.[18] Achieving deeper knowledge from the quality of nurse-patient communication in ICU can help the nursing staff to gain a better understanding of the issue and provide more effective communication with these patients, given that communication can lead to the implementation of patient-based care, which, in turn, will reduce patient frustration.[19]

Methods

This observational study was conducted in a cardiac surgery ICU with 14 beds in a cardio-specialized hospital in Shiraz, south of Iran from January to April 2014. This study is a part of a larger study, which sought to describe the quality of communication without communication aids between nurses and patients under mechanical ventilation in the ICU ward in Namazi hospital. In this research, 10 of the 21 qualified nurses were selected through simple random sampling (listing all nurses, assigning a number to each, and selecting numbers from a table of random numbers). The study inclusion criteria required nurses to have at least one year of working experience in ICU, be willing to participate in the research, and have the minimum required work shifts on a regular basis, which was four dayshifts and one nightshift. Additionally, the exclusion criteria included suffering from speech or hearing impairments, intending to quit the job, and moving to other hospital wards. According to a previous study,[20] 35 patients were required for this study. These patients were selected after cardiac surgery by using convenience sampling. The inclusion criteria for the patients included being between 18 and 60 years old, willing to participate in the study, having an endotracheal tube, being under mechanical ventilation, with Glasgow Coma Scale (GCS) score of 11 or above, and Richmond Agitation-Sedation Scale (RASS) score between -3 and +3. Furthermore, the exclusion criteria included decreased Glasgow score to below 11, RASS score > 3 or < -3, and suffering from blindness, deafness, and cognitive impairment.

The RASS was used to assess sedation and agitation[21] This scale can show changes in the level of consciousness over time or changes in response to analgesic drugs. The RASS scale is a 10-point numerical scale (+4 to -5). In this study, patients who obtained scores of +4, -4, and -5, respectively, indicating violence, deep sedation, and inability to respond to voice or physical stimulation, were excluded from analysis. The GCS is an assessment tool used to describe consciousness level;[22] it was developed to standardize observations of consciousness level in patients with head injuries. The scale consists of three separate responses: eye opening (E), verbal (V), and motor responses (M); each classified by a series of degrees of responsiveness. Each subdivision was allocated a number, and higher numbers mean better scores. The data collected contained demographic characteristics (age, sex, marital status, education level, and ability to read and write), data of admission, reason for surgery, language, hearing, and vision status, substance abuse, mental disorders, recent surgery, GCS score, and RASS score.

This study also assessed communication quality, including content of communications (five contents), communication methods (four methods), and the initiator of the communications (nurse or patient) by using a researcher-prepared observation checklist. The checklist was developed based on the existing literature in psychological and behavioral domains[20,23] and was approved by faculties of Nursing. The content of communication included physical needs, pain, symptoms, emotions, decisions on treatment, and questions about the endotracheal tube. In addition, communication methods included head nod, non-verbal expressive actions, and writing. Besides, the initiator of the communication was either the nurse or the patient. The checklist was filled

during and after the communication. Moreover, nurse and patient satisfaction with communication during routine care in ICU were evaluated by a six-item Likert scale, ranging from "completely satisfied" to "not at all satisfied". Five faculties of Nursing experienced in critical care nursing approved the validity of the scales. However, inter-rater reliability of the observation checklist has not been evaluated. At first, the nurses selected became familiar with the study procedure, signed written informed consents to take part in the study, and completed demographic information forms in one session. Then, the patients waiting for cardiac surgery were selected based on the study's inclusion and exclusion criteria using convenience sampling. After explaining the study objectives and procedures and obtaining written informed consents to participate in the study, demographic information forms were completed by the patients. After cardiac surgery, GCS and RASS scales were completed for the patients and those qualified were enrolled in the study.

One of the researchers, who was in the staff, observed routine communications between the nurses and patients in different work shifts and recorded the results according to the checklist. The presence of the observer could affect nurses' behavior and their relationship with patients. However, a researcher attending several meetings before formal observations might turn him to *the participant as observer* according to Gold's Typology of Participant-Observer Roles.[24] Overall, the study recruited 35 patients and 10 nurses. Five communications from each nurse with patients were observed; therefore, the observer monitored 175 patient-nurse communications. Patient satisfaction was assessed 12 h after extubation. Nurse satisfaction was also evaluated after each communication.

The Ethics Committee of the Shiraz University of Medical Science approved this study. Moreover, all participants signed written informed consents after receiving an oral explanation about the research objectives and procedures. Participants were also assured about anonymity and confidentiality of their information. The data obtained was analyzed by using the SPSS software, version 22. Descriptive statistics, including mean, frequency, and standard deviation, were applied to describe demographic, professional, and communication features. Additionally, the correlations among the variables were assessed by using T-test, one-way ANOVA, chi-square test. To determine the correlation between the patients' satisfaction level and the demographic parameters, given that the data were not distributed normally, Mann-Whitney U and Wilcoxon non-parametric tests were used.

Results

The majority of the patients were male (77.1%) and all were married. Patients' ages ranged from 24 to 60 years, with mean age of 52.05 years. Furthermore, most of the patients (82.8%) had undergone coronary artery bypass graft surgery (Table 1). In addition, 60% of the nurses were female and their ages ranged from 26 to 49 years, with mean age of 31±6.64 years. In addition, the mean of their working experience was 3.55±0.98 years at ICU and 7.94±5.82 years as a nurse. Eight nurses (80%) held BSc. degrees and two (20%) had MSc. degrees.

Table 1. General characteristics of patients (*n*=35)

Characteristics	Values
Age in years; mean ±SD, range	52.05±8.56, 24 - 60
Males; *n* (%)	27 (77.1)
Marital status; *n* (%)	
Married	35 (100)
Education level; *n* (%)	
Uneducated	10 (28.6)
Undergraduate and Graduate	25 (65.7)
Academic	2 (5.7)
Substance abuse; *n* (%)	
No	26 (74.3)
Yes	9 (25.7)
Surgery; *n* (%)	
Coronary Artery Bypass Graft	29 (82.8)
Valve surgery	6 (17.2)

Patients initiated 75.43% of the communications observed (132/175), whereas nurses only did it in 24.54% (43/175), mostly to check consciousness level and encourage patients to breathe. Considering communication contents, 50.3% was related to physical needs – eating, drinking, elimination, oral care, and positioning, 23.5% was related to pain, and only 1.1% was related to the patients' feelings, including frustration, anxiety, and fear (Table 2). Moreover, most of the communication methods used by patients (88.57%) were non-verbal expressive actions, including hand gestures and purposeful stares, followed by head nods (10.86%), with only one instance of writing by the nurse (0.57%). Assistive communication tools, such as word and picture boards, were not used.

Table 2. Content of 175 communications between nurses and intubated patients

Content	Percent
Physical needs	50.3%
Pain	23.5%
Emotions	1.1%
Endotracheal Tube Therapy questions	17.2%
Other symptoms	1.1%

Considering participant satisfaction, the results showed that only 5.7% of the patients and 0% of the nurses were "completely satisfied" with the communications. However, the nurses showed less overall satisfaction, compared to the patients. According to the results, 20% of the nurses showed no satisfaction (Table 3).

Table 3. Frequency distribution of the nurse and patient satisfaction levels with the communications

Level	Nurses (n = 10)	Patients (n = 35)
Completely	0%	5.7%
Partially	2.8%	8.6%
Low	31.4%	22.8%
Very low	45.7%	54.3%
Not at all	20.0%	8.6%

Table 4 shows no significant relationships between the nurses' satisfaction and their working experience as nurses in ICU, and patients' age, gender, education level, and history of substance abuse and similar finding in the patients' satisfaction level with the demographic parameters.

Table 4. Relationship between the satisfaction of nurses and patients with demographic and professional characteristics by group

Characteristics	Group	
	Nurses p-value	Patients p-value
Nurses		
Age	0.983	0.250
Gender	0.582	0.727
Education	0.598	0.769
Experience	0.885	0.782
Patients		
Age	0.943	0.785
Gender	0.873	0.277
Education	0.630	0.087
Substance abuse	0.697	0.076

Discussion

The findings of this study disclosed that patients initiated communication in more than three fourths of the cases, whereas nurses initiated communication when checking the patients' consciousness and encouraging them to breathe. These findings contrast those from other studies wherein nurses initiated communication with intubated patients.[20] These differences could

be attributed to different working conditions and to the fact that the nurses in those studies used communication aids. Due to challenges in communicating with and understanding patients, nurses in the present study might have avoided contact with them. Results from other studies also indicate that nurses became hopeless and, consequently, avoided contact when patient-nurse communication was difficult.[16] Other factors, including heavy workload,[25] lack of appropriate communication skills training, and lack of communication aids are also among the effective factors in this regard.[26]

In our study, basic physical needs, pain, and discomfort were the main reasons driving intubated patients to establish communication. These findings are similar to those from another study.[2] The findings of the current study reveal that only a small percentage of the content of the nurses' communication with intubated patients (1.14%) involved emotions and feelings. The findings also indicate that the majority of the communications involved the patients' physical rather than emotional needs. In this sense, other studies have disclosed that, although important, the patients' emotional needs were treated subsequent to their physical needs.[27] Yet, it is clear that if patients' physical needs are satisfied, they will express their emotional conditions, such as anxiety, discomfort, and frustration.[28] When nurses initiate communication and there are more instances of communications, patients' emotional and spiritual needs, *i.e.*, requirements of holistic care, are taken into account besides their physical needs.[29] Failure to pay attention to emotional and mental aspects not only prolongs length of hospital stay, but also aggravates the disease status and leads to discomfort, anxiety, and frustration.[30]

To maintain communication, most patients in the present study used non-verbal expressive actions, such as purposeful stares, hand gestures, and head nods. This was consistent with findings from other studies wherein most patients used body language and purposeful stares.[20] According to studies, non-verbal behaviors, such as squeezing a hand,[2] head nod, and gesture,[31] were the most common methods used by ICU nurses and patients to communicate [2]. Although these methods can be accompanied by misinterpretation,[32] some studies have shown that proper use of these techniques can facilitate communication. During the current study, researchers observed only one instance of using pen and paper in response to patient's request. The nurses apparently relied on their experience to comprehend these patients' messages. Nevertheless, having access to communication aids and training the staff on the use of said aids could significantly increase their communication success. To communicate with their patients, nurses can also use augmentative and alternative communication strategies.[15,31]

Regarding satisfaction, 20% of the nurses were "not at all satisfied" with the communication. However, the rest of the nurses reported partial satisfaction to very low satisfaction with communication. Nurses' dissatisfaction could be due to failure in understanding the patients' needs and inefficient communication. Thus, nurses' satisfaction levels can be increased by increasing their knowledge and skills in communicating with intubated patients and providing them with access to communication aids, which lead to communication that is more successful. On the other hand, patients showed lower satisfaction levels. This could be because the nurses' failure in comprehending the patients' messages entailed non-fulfillment of their needs. This agreed with results from other studies, indicating that the majority of the patients (62.2%) were poorly satisfied with their communications, while the patients' satisfaction levels significantly increased by using different methods to facilitate communication.[13] Nurses and patients' low satisfaction levels, and poor usage of communication aids indicated the need to pay more attention to communication with intubated patients, nurses' training, and provide required communication aids in Iran.

Limitation. One of the limitations of the present study was the presence of the observer, which might have affected nurses' behaviors. Of course,

given that the observer's role was to participate as observer, which is common in health care settings, observing operations could help to understand and improve care processes, including communications. It should also be noted that inter-rater reliability of the observation checklist has not been evaluated. Therefore, considering this issue should be warranted in future studies. Moreover, because this study took place in only one ward, it is hard to generalize the results. Thus, further studies are recommended on larger sample sizes at different centers.

Conclusion. The results of the present study indicate that nurses' communication with mechanically ventilated patients in cardiac surgery ICU was run in a traditional way (non-verbal with no communication aids), mostly focused on physical needs and not emotional needs, and it was not satisfactory. Teaching these issues and communication aids to Iranian nurses and nursing students is poorly described in most Iranian studies and requires longer follow-up studies to implement comprehensive care based on the needs of patients in intensive care unit, both in prevention and in nursing interventions.

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The trajectory of crack users to the street situation in the perspective of family members

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Original article

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The trajectory of crack users to the street situation in the perspective of family members

Abstract

Objective. To understand the family experience regarding the trajectory of crack users for the street situation. **Method.** Qualitative study using the systemic approach as the theoretical referential and the narrative as methodological referential. We conducted interviews with eleven family members of crack users with street situation experience cared for at a community mental health service. We analyzed the interviews using the inductive content analysis technique. **Results.** The family members understood the trajectory of the crack users for the street situation from two perspectives. One before the street situation process, for which they described a problematic childhood, the presence of stressor traumas/events, vulnerabilities in the family environment, and their family members' encounter with the drug world. Moreover, another posterior to the street situation, for which they narrated the perception of alterations in the users, the discovery of crack use, the deepening of the individuals'

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relationship with the streets, and the adoption of coping strategies. **Conclusion.** It was made evident that the family adopts an explicative model for the behavior of drug use and contact with the streets based on the life history of the crack user family member.

Descriptors: crack cocaine; family relations; homeless persons; community mental health services.

Trayectoria de usuarios de crack en situación de calle desde la perspectiva de los familiares

Resumen

Objetivo. Comprender la trayectoria de usuarios de crack en situación de calle desde la perspectiva de los familiares. **Métodos.** Estudio cualitativo, realizado en un servicio público de salud mental, que utiliza el abordaje sistémico como referencial teórico y la narrativa como referencial metodológico. Se realizó una entrevista en profundidad con cuestión orientadora junto a 11 familiares, y la técnica de análisis de contenido para la exploración de las narrativas. **Resultados.** Los familiares comprendieron la trayectoria para la situación de calle a partir de dos perspectivas principales: el pasado, donde narraron eventos de la infancia / adolescencia de los usuarios, y el presente, donde contaron específicamente sobre la ocurrencia de la situación de calle. **Discusión:** Los eventos que justifican el uso de drogas son percibidos como momentos de fragilización, a partir del entendimiento de que el usuario era un "niño-problema". **Conclusión.** Se evidenció que la creencia familiar puede funcionar como los ajustes para cuidar y mantener la unión y la homeostasis familiar.

Descriptores: cocaína crack; relaciones familiares; personas sin hogar; servicios comunitarios de salud mental.

Trajetória de usuários de *crack* para a situação de rua na perspectiva de familiares

Resumo

Objetivo. Compreender a experiência familiar sobre a trajetória de usuários de *crack* para a situação de rua. **Método.** Estudo qualitativo utilizando a abordagem sistêmica como referencial teórico e a narrativa como referencial metodológico. Foram realizadas entrevistas com 11 familiares de usuários de crack com vivência de situação de rua e atendidos em um serviço de saúde mental comunitário. As entrevistas foram analisadas por meio da técnica de análise de conteúdo indutivo. **Resultados.** Os familiares compreenderam a trajetória dos usuários de *crack* para a situação de rua a partir de duas perspectivas. Uma anterior ao processo da situação de rua, onde descreveram uma infância problemática, presença de traumas/eventos estressores, vulnerabilidades no ambiente familiar e o encontro dos seus familiares com o universo das drogas. E uma posterior, onde narraram sobre a percepção de alterações nos usuários, a descoberta do uso de *crack*, o aprofundamento da relação dos indivíduos com as ruas e a adoção de estratégias de enfrentamento. **Conclusão.** Evidenciou-se que a família adota um modelo explicativo para o comportamento de uso de droga e contato com a rua baseado na história de vida do familiar usuário de crack.

Descritores: cocaína crack; relações familiares; pessoas em situação de rua; serviços comunitários de saúde mental.

Introduction

The phenomenon of crack usage has elicited the attention of the government and the Brazilian and international society due to the social, health, and family problems experienced by many of its users. The experience of these problems may get to the extreme of favoring the occurrence of street situation experiences,[1] thus intensifying the susceptibility to the involvement with violent and illicit activities, compulsive use pattern of the drug, increased risk of contamination by agents that cause transmissible diseases such as hepatitis, tuberculosis, and HIV, marginalization, and difficulties to remain with the families.[2,3] Although studies carried out in the last decades indicate that the street situation is caused by a multitude of factors that vary from the economic and structural dynamics of the society to personal and psychological reasons, crack users in Brazil as in other countries have been expanding the characteristics of ties with the streets.[4]

It is known that the street condition phenomenon in crack users does not occur instantly, but is part of a process of weakening of the bonds in the social and family environment.[5] In the literature, one may observe the presence of two primary chains of study on the familiar aspects involved in the trajectory towards the street situation in drug users. On one side, there are studies concerned with studying the familiar characteristics such as causal or predisposing factors for the occurrence of the street experience[5,6] while, on the other, are studies, still incipient, related to the role of the family in preventing and solving the street experience.[7]

The primary problem of the studies that investigate the family as the cause of the street situation is that they collect data from the reports of people that are living in the streets. Therefore, they present only the viewpoint of this particular group. Hence, the family, as the primary source of information, is disregarded. Regarding the understanding of the role of the family, one may observe that the majority of the studies adopt the paradigm of linear causality, in which the families are considered causers of the drug use and of the street situation for presenting environmental and/or relational characteristics or risk factors. Adopting a circular causality model,[8] in which it is understood that the behavior of drug abuse impacts the family dynamics and that the family dynamics impacts the chemical dependency, allows removing the family from the causer role. Moreover, it widens the focus to the family relations and offers space to the experience of family members with an individual in the context of drug abuse and street situation. In this sense, the objective of the current study is to understand the family experience regarding the trajectory of crack users to the street situation.

Methods

This qualitative study employed the systemic approach as the theoretical referential and the narrative as a methodological referential[9] to interview family members of crack users with street situation experience. The adoption of a systemic theoretical body was initially guided by two primary aspects. First, by the understanding that the street situation is not a phenomenon with consequences only for one of the family members, but has consequences for the entire family group. Therefore, the systemic approach allowed investigating, albeit from an individual perspective, the relationships that exist within a wider family context, providing important aspects regarding the family as a unison and inseparable group. Second, by the need to change the current paradigm of approach to the family group: instead of looking within the families, especially in family relations, for the causes of the drug use and the street situation, we sought, in this study, to understand how they experienced, understood, and acted in the face of such events.

A narrative may be defined as a textual form that allows translating the knowing into telling, shaping the human experience into an assimilable form of meaning structures.[10] Its articulation point with the systemic approach is concentrated mainly on the fact that the narrative is not just the report of an individual experience, but is built through dialogues to described experiences shared by members of a family, group, or community.[11] Therefore, the narrative consists of a form of establishing the vision of the individuals in the world, insofar as they situate the events and actions into stories instituted in the temporal order of what was experienced.[12] Upon telling and interpreting experiences, the narrative establishes a mediation between the interior world of thought-feeling and an exterior world of observable actions and behaviors.[13]

Study location. The study participants were selected in a Psychosocial Care Center for Alcohol and Drugs (CAPS ad) of a city in the state of São Paulo, Brazil. Before starting data collection, the first author frequented the CAPS to get to know the dynamic of the service and be able to get close to possible participants. The researcher has experience in conducting interviews with family members.

Participants. Family members of crack users with experience in a street situation, assisted by the mentioned service, in the period from June 2014 to February 2015. The street situation experience was defined as moments in which the users left their homes and started living in the streets as a result of crack use. The inclusion criteria were being at least eighteen years old, having some degree of kinship with the user, and having followed their problem with crack use and with the occurrence of the street situation. The initial methodological design predicted selecting only the participants in the therapeutic family groups. However, due to the low number of subjects that met the inclusion criteria and considering the non-emergence of new cases in the third month of data collection, we resorted to consulting the service professionals. In total, we interviewed eleven family members of eleven crack users.

Data collection. The approach and invitation to family members of the three therapeutic groups were carried out by the primary researcher at the beginning of each group session. The family members interested in participating in the interview sought the researcher at the end of the session. Depleting the possibilities of finding family members in the groups, the researcher asked the professionals to indicate family members that met the research criteria. Such family members were approached through telephone contact using a single text elaborated for this purpose. The family members that accepted to participate in the study were scheduled to attend the service. Considering the criteria for quality in qualitative research,[14] all participants were interviewed twice in a period not exceeding fifteen days after the first interview. The objective of the second interview was to confirm the information provided in the first, as well as explore and deepen the issues that had not been made clear and were important for contemplating

the studied phenomenon. All the interviews were carried out in a reserved and private room of the service itself, digitally recorded in full, and lasted around thirty to forty minutes. The following data collection instruments were used: 1) questionnaire with socioeconomic and demographic information of the family members and the families, 2) questionnaire with data on the users, and 3) in-depth interview with narrative and systemic focus. The following guiding question was used: "We know that when people use crack, they may leave their homes and go through some periods in the streets. In this sense, could you tell me how this happened with your family member? How did you cope with this?" The dataset received an alphanumeric code according to the sequence in which the interviews took place.

Data analysis. The two interviews were grouped and transcribed in full. For the exploration of the material, the inductive content analysis technique was used, which is constituted of three phases:[14] 1) preparation phase - identification of the meaning that was contained in a given statement and/or excerpt through repeated readings, seeking to learn "what was going on" starting from the whole; 2) organization phase - included the open encoding (typing of notes in the margins of the text), elaboration of encoding spreadsheets (gathering of typed notes in a data spreadsheet), clustering (summarization of the data through the clustering of the notes), categorization and abstraction (elaboration of subcategories and categories through the classification of data as "belonging" or "non-belonging" to a given group); and 3) report generation phase - description of the results obtained with the analysis. This process was carried out by two researchers, with the generated categories being validated by a team of four judges who were researchers in mental health. The categories were sent previously to each judge that should analyze if the narratives were represented in the category. The intensity of agreement among the judges was measured using the Kappa coefficient, whose value was of 1.00 - i.e., an almost perfect agreement level. Thus, by the end of the analysis, the data were organized into two main categories, each with four subcategories.

The study was authorized by the service and approved by the research ethics committee with protocol CAAE 34923414.9.0000.5393. All ethical norms were respected.

Results

Of the eleven family members interviewed, nine were mothers, with an average of 57 years old, evangelical (7), and coming from less privileged areas of the municipality where the research took place (9). Regarding the characteristics of the families, we verified that they were composed of three people, lived in their own houses (8), and belonged to economical classes B or C (11). Concerning the characteristics of the users, it was made evident that almost all were men (10), with ages characterizing them as young adults (average of 31.4 years old), low education level (average of 5.8 years of studies), single (7), and who did not exercise paid activities at the moment of the research (8).

The analysis of the narratives showed that the family members understood the trajectory of their loved ones to the street situation from two perspectives which configure the study categories: *Learning the ropes: returning to the past to explain the present*, in which subjects narrated events of the childhood/adolescence of the users, conforming to an explicative model of the family about drug use, and *There is paranoia among us: the family understanding about the occurrence of the street situation*, in which the family members told specifically about the occurrence of the street situation from the start of crack use. The categories and subcategories generated may be visualized in Figure 1.

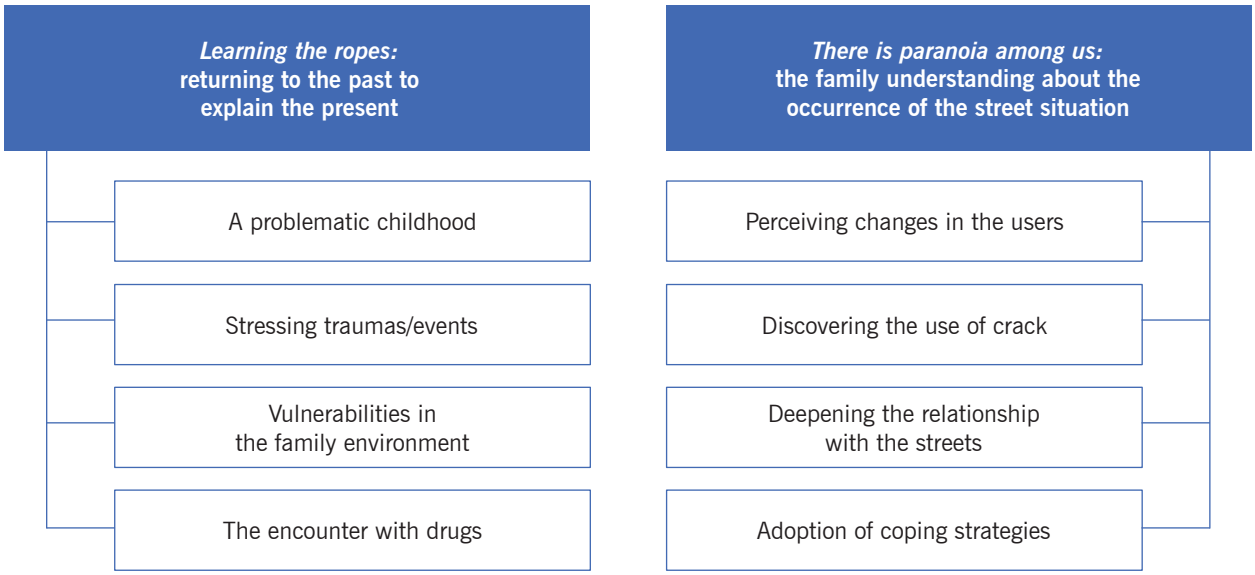

Figure 1. Categories and subcategories of the study

Learning the ropes: returning to the past to explain the present

When starting their family members' stories on the streets, the participants in this research presented contexts of suffering. These suffering contexts began in childhood and continued through the following cycles. The family members described several situations that defined "problematic childhoods". In this time, the primary complaints came from the schools and were generally related to the presence of behaviors considered inappropriate. The result of such problems and the interaction of the families with the schools culminated in processes of school changes going so far as school dropouts. The study participants also recognized the behavior of "staying on the streets" since childhood. The following excerpts seek to provide a panorama regarding accounts that compose this category: *Look, since a child he was always a rebel, he was always a problematic boy, you know? He did such things, so far-fetched [...]* (F8). *He was always mischievous, he only did well in kindergarten. At this time, he was intelligent, dedicated... However, afterward, when he was bigger, he did not conclude his studies because he did not like studying and gave a lot of trouble at school. So he had to keep changing schools because the schools asked us to remove him [...] He went well in tests, but the teachers would tell me he would fail because of excessive absences* (F7). *[...] he didn't want to study, was giving a lot of trouble, so I took him out of school (the user). However, since he was addicted to arcade games, he would take the shoeshine box and stay at the bus station, he would spend all day out of the house. He would say that the money he earned for shining shoes, he would spend playing* (F11).

The interviewees explained the "rebellious" behaviors as having been caused by traumas or stressor events. The interviewees' accounts describe situations of loss that adversely marked the life trajectories of the users, such as the death of close people and problems regarding fathers. *When his father died, he was eight years old. However, he was not at the wake or the burial, so he did not see his father in a coffin. However, their relationship was very strong; they had much love for each other, much admiration. Therefore, I think this may have harmed him a*

little (F1). *When he started to rebel was when he found out that his father didn't want anything to do with him, didn't want to register him under his name, used to say he wasn't his, you know? Back then, I already had a son because I had become widowed. So I became very desperate, I did not want to have him, you know? I got angry at everything, I do not know if this passed over to him too* (F3). The childhood contexts were also described as contexts of "vulnerabilities in the family environment". The interviewees reported the presence of family conflicts, the absence of the fathers in the family environment, and about events that refer to the existence of incoherence in the establishment of boundaries, thus suggesting unstable family systems. The following accounts exemplify this context: *They never got along; I do not know, since childhood it seemed there was something wrong with him (the user) that he would keep insulted his father* (F3). *I always worked as a maid since my husband died, so I would stay a long time away from home, and he was alone much [...]* (EEL). *He was very much protected by his father, who didn't let no one hit him, always defended him when he did something that we didn't think was right [...]* (F1).

These childhoods in such vulnerable contexts have, as consequences, the "encounter with drugs". According to the accounts of the interviewees, since childhood the sick family members frequented places of greater risk; therefore the start of drug use took place in this context. We grouped two primary contents in this section: the influence of pairs in the initiation to drugs and the use of drugs by other family members. The following excerpts seek to give an example of the accounts grouped in this subcategory. *He always had these friendships, you know, these guys that use drugs, drink, are always at the bar door, he only had this type of friend. So I believe that they influenced a little* (F6). *Almost all her family members have had drug problems; her paternal grandfather died from drinking too much. Her aunt, around three months ago, was committed for drinking problems; of her five uncles, four drink. So I think drugs come with this sort of thing, they come from the family [...]. This is what I think was able to influence her* (F5).

There is paranoia among us: the family understanding about the occurrence of the street situation

In this second moment of the family narratives, the interviewees listed events linked specifically to the occurrence of the street situation, from the initiation of crack use, as well as the coping mechanisms used by the families. Although aware of the drug use, the family member reported not knowing about the use of crack. Thus, a trajectory starts marked by a relationship in which, from the moment when it does not perceive that something is not well, the family moves to moments in which it perceives and recognizes this, as well as searches for solutions. We called this category "there is paranoia among us", because this process was described with much intensity where the family and the chemical dependent presented a confusing and ambivalent relationship, which, so far, has only intensified the problem.

In the first subcategory of this moment, denominated "perceiving changes in the users", the family members recounted the first signs that a change was occurring in the behavior of the drug user family member: the practice of thefts of family belongings; aggression; physical changes such as lack of hygiene and weight loss; and also the situation of the user spending more time in street environments. The following accounts describe this moment: *He started to get more rebellious, rude with me, started with comebacks, speaking profanities, something he was not accustomed to doing. So he started to get rude and not to want to do anything that he used to like before* (EF1). *[...] he started to lose weight, lose his appetite, started to come home dirty, stinky, sometimes with a burn mark on his hands and mouth [...]* (EF6) *Then he started selling everything he had. I could not leave anything lying around, or he would sell it. So I started looking into it, and he was really messing with crack* (EF7). *So when he started using crack was when he started to*

spend more time on the streets, he started to not come home anymore. Then I thought he was using some very strong drug (EF5).

Regarding the discovery of crack use, represented in the second subcategory of "discovering the use of crack", many family members said they did not recognize or know that the changes presented by the users were consequences of crack consumption. In some reports, these family members said they noticed the use of crack because of the environment, and most reported becoming aware because someone close to the family told them: *The only thing I noticed, because there was a room at the back of my house, and I would go there and see so much ash, so much ash, because the crack they use is with ash, right... I said: my God, what is this? [...] I would just work, went from home to work, from home to work, we did not even have time to watch TV, TV to know what a drug was. So I did not know at first that the change in him was because of crack* (EF3). *It was my brother-in-law, he gives lectures (former drug user who gives lectures for free in churches and schools about drug use prevention)... so he suspected, informed us of his suspicions, we went after him and caught him using drugs at school, right at the door of the school he attended* (F2). *I did not know. My luck was that my son-in-law said to me like this: look, I am going to tell you this, ma'am, and told me. When he told me, I went insane* (EF10).

In the third subcategory, "deepening the relationship with the streets", it stands out that no family member reported the occurrence of a "first episode" of the street situation but, to the contrary, they reported events that referred to the deepening of the relationship of the individuals with crack and the street situation, configured by periods of stability characterized by going to the streets and returning from the streets to the family environment: *That's right, because before he would go to the streets, but always came back home, sometimes 1 AM, 2 AM, but always came back. Then, what happens? Before, he would come back 1 AM, 2 AM, but he started to stay two days, three days on the streets, you know. There were even times when he would go a month without showing up, without giving a sign of life, and, when he came back, he would come back in that situation, dirty, with his hands all hurt, and thin, really thin. And, when he arrived, he would fall into bed and sometimes sleep one or two days straight. Then he would get up, take a shower, and eat, but geez! He would eat whatever he saw in front of him, and then he would go off to the streets again* (EF8).

Regarding the "adoption of coping strategies", which represent the last subcategory, the family members narrated the ambivalence experienced in the face of the street situation episodes. They reported the adoption of different strategies in an individual, associated, or alternated manner with other family members, depending on the moment of the street situation in which the user was at - going to the street contexts or returning to the family environment. Thus, the following strategies were reported by family members: search or not on the streets, allow or not entry to the home, let go to the streets or not, and put them out on the streets or not. Describing a moment of ambivalence experienced by the family members regarding the strategies for searching or not on the streets: *Oh, we searched for him, because we didn't sleep, at lunchtime, we remembered and wondered where he might be. What is he eating* (F4). *So we searched for him, we would go out searching, telling many people 'if you see him, call me', I had a lot of help from people that saw him and came running to us, then I would call my husband, my husband was at work, he would leave work 'let's go because they say he's over there', so we went to get him* (EF45). *I would wait for him, I would sleep, I still sleep to this day, I do not take medication, and I do not take anything. Because where he goes I cannot go, never did, I never went after him. So I ask God because where he goes, God goes in the right place* (EF10).

Discussion

Regarding the characteristics of the subjects interviewed, we verified that the majority of family members were mothers. This data is in accordance with results of a study carried out in Brazil which evaluated the relationship between cocaine and crack consumption with the dimensions of quality of life and social functioning of 1,560 young adults.[15] According to the study, the mothers seemed to be more "present" in the homes of crack users (74% of the cases) than on the homes of individuals in the general population, which leads to the belief that this family setting may be especially common in this population.[15] This data is important insofar as the strategies for preventing the street situation may be put into action by the health system in families that have some crack user as a member, viewing mothers as the primary figures to be considered in a family intervention process. On the other hand, this finding also indicates the possibility of parental overload, possibly leading to the occurrence of diseases and other aggravations to individual and family health. This was also pointed out by a study conducted in Canada about the impact of the use of alcohol and other drugs in the family dynamics, which found that most parents interviewed reported feelings of stress, anxiety, and depression, as well as other problems for the family as a whole.[16]

Concerning the characteristics of the families, given the sample size, their profiles were similar both to the profile of the Brazilian population considering the results of the last National Survey by Sample of Households and to the profiles of families of crack users.[17,18] Regarding this last aspect, a qualitative study which analyzed the structures, relationships, and backgrounds of drug use in families of crack users through a genogram found very similar data, especially in regards to the economic classification and the low number of people in the first generation of the families that went to school.[18] The crack user profile found in the study was also consistent with the profile described in several studies about crack users in Brazil, including the predominance of men, the low education level, and the absence of formal work.[1,3,15,19]

This study allowed understanding that, in the perspective of family members, the trajectory of crack users to the street situation begins in childhood. Stories of traumatic events, behavior issues, and difficulty to remain in school since childhood explained the beginning of drug use and street living.

The interpretation that people elaborate for a given experience of health-disease is the result of the different means through which they acquire their knowledge. Therefore, the explicative models are adopted by individuals with the perspective of offering an understanding of a given event, aiming the elaboration of the personal and social meaning of the experience of an aggravation.[20] For the family members that participated in this study, the events narrated about the childhood and adolescence of the crack user family member were perceived as moments of weakening that justify accepting and welcoming that child/youngster as the only way out.

The vulnerability context of these families is also a relevant aspect that must be highlighted. A child's socioemotional development is related to their biological development and interactions with their environment since birth. Children who live in vulnerable environments are at greater risks of presenting difficulties in developing social, emotional, and self-perception competencies that aid them in the adoption of proper behaviors to the different contexts of society.[21]

In this context, when the behavior problems started to get in the way of school activities, the mother was called. However, the solutions found for these problems resulted in a constant changing of schools until school dropout. Elementary and high schools are closer to the families, so they may be in a strategic position to identify children and youngsters that need follow-up, contribute to the development of non-stigmatizing actions, and articulating with the community and health services to promote mental health and well-being to the young people.[22]

School dropout favored the child or adolescent to intensify their time on the streets, thus justifying the beginning of drug use. In this initial period, the family recognized the drug use as a consequence of the environment frequented by the youngster. For being understood as a consequence of this troubled childhood, the drug use was not considered a problem at first. In a way, the family organized itself to be more tolerant in the sense of keeping the group united and meeting the needs of the group.

In the perspective of the family systems, the psychosocial problems in the family are better understood and treated if analyzed from a circular perspective. In this perspective, each member of the family contributes with well- or ill-adapted interactions.[23] Following this logic, we understand that as the dependent family member intensified the drug use and their permanence in the streets, the family weakened their rules to keep the user in the family system. In other words, this means stating that the bad behaviors presented by the users may have acted as negative feedback, providing "information of the deviation", where the family system acted to "neutralize it" according to their belief system or way of understanding. This regulation or adjustment of the system, contained in Cybernetics, aims to maintain the survival of the family group, controlling the disturbances that afflict it, preventing changes from occurring beyond a threshold level that may change its organization.[24]

This way of dealing with the use of drugs allows understanding the second category of this study, characterized initially by difficulty in recognizing the use of crack and the intensification of the street situation. The difficulty in breaking with the functioning more tolerant with the use of drugs adopted by the family and the lack of information regarding crack determined the slowness to adopt more explicit coping measures. The lack of information about crack was one of the primary causes of family unawareness. The participants reported not having sufficient information to identify the alterations presented by the users. A study conducted with family members of crack users with the objective of analyzing the influence of the family environment on crack consumption found several family factors that contributed to the start of crack use.[25] Among them, the family disinformation and unawareness about drug use stood out, which prevented many families from acting in a sense to prevent/identify or even treat their family members, thus corroborating the data found in this study.[13] Therefore, the trajectory of the crack user to the streets is not understood by family members as a single moment; to the contrary, the streets have been present in the lives of the users since childhood. When it was no longer possible to maintain the family functioning more tolerant of drug use, the family needed to recognize the problem of intense crack use and street living, and adopt more restrictive measures. However, one may observe an ambivalence regarding such restrictive measures.

Often, families with psychosocial problems are helpless, tired, and inadequate in the face of their problems. Changing the way of functioning of the family so to seek other forms to handle the problem depends on their abilities to alter their perception of the problem. Systemic family nursing proposes that the nurse seek a position of collaboration with the family in the sense of seeking the necessary changes for coping with psychosocial problems. Under this perspective, the nurse that believes that the family unit can resolve their problems will not try to resolve them for the family because they know that the attempt to solve the family problems may inadvertently increase the family's sensation of helplessness and inadequacy, and promote dependency.[23]

This study, upon analyzing the family accounts about the trajectory of their loves ones involving the use of crack and the street situation found that the families adopt a meaning of explanation or belief that seems to function as adjustments to care for and keep the union and homeostasis of the family. The literature is clear when stating that the presence of drug use, violence, and ruptures in the family environment are good predictors for the occurrence of mental health problems for the entire family group.[5,16,18,19,25] Therefore, the

participants in this study also reported some of these factors as causers of the behaviors of the crack users. However, this knowledge was an important element for family members to keep caring. The reduced number of participants in this study is a relevant limitation of the study, because it may be inferred that the family members are participating in little of the treatment of the crack user. And, in this sense, the analysis carried out is limited to family members who are still available to keep taking care of the sickened family member.

Conclusion. The trajectory of the crack user to the street situation told from the narratives of family members of such users showed that the family adopts an explicative model for the drug use behavior and contact with the streets, based on the life story of this family member. The method adopted allowed exploring the family beliefs, their vulnerability context, and their efforts for keeping the family group united so to meet the needs of the entire group. The study reinforces the understanding of the family as a source of care, but also as a unit that required care to be able to exert its role in the recovery of crack users fully. Other studies are necessary to deepen this understanding and answer the questionings that arise upon verifying that, despite the evidence, families take long to recognize their loved ones' health problems.

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Metabolic fatigue in resuscitators using personal protection equipment against biological hazard

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Original article

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Metabolic fatigue in resuscitators using personal protection equipment against biological hazard

Abstract

Objective. To describe the effects of wearing individual protection equipment against biological hazard when performing a simulated resuscitation. **Methods.** Uncontrolled quasi-experimental study involving 47 volunteers chosen by random sampling stratified by sex and professional category. We determined vital signs, anthropometric parameters and baseline lactate levels; subsequently, the volunteers put on level D individual protection equipment against biological hazard and performed a simulated resuscitation for 20 minutes. After undressing and 10 minutes of rest, blood was extracted again to determine lactate levels. Metabolic fatigue was defined as a level of lactic acid above 4 mmol/L at the end of the intervention. **Results.** 25.5% of the participants finished the simulation with an unfavorable metabolic tolerance pattern. The variables that predict metabolic

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fatigue were the level of physical activity and bone mass -in a protective form- and muscle mass. People with a low level of physical activity had ten times the probability of metabolic fatigue compared to those with higher levels of activity (44% versus 4.5%, respectively). **Conclusion.** Professionals who present a medium or high level of physical activity tolerate resuscitation tasks better with a level D individual biological protection suit in a simulated resuscitation.

Descriptors: cardiopulmonary resuscitation; personal protective equipment; anaerobic threshold; containment of biohazards; stress, physiological.

Fatiga metabólica en reanimadores usando equipos de protección personal frente a riesgos biológicos

Resumen

Objetivo. Describir cómo afecta llevar puesto un equipo de protección individual frente a riesgos biológicos durante la realización de una reanimación simulada. **Métodos.** Estudio cuasi-experimental no controlado en el que participaron 47 voluntarios elegidos mediante un muestreo aleatorio estratificado por sexo y categoría profesional. Se realizó una toma de contantes vitales y parámetros antropométricos, así como una determinación basal de lactato; posteriormente, los voluntarios se pusieron un equipo de protección individual nivel D frente a riesgos biológicos y realizaron una reanimación simulada durante 20 minutos; después del desvestido y de 10 minutos de reposo se realizó otra extracción de sangre para conocer los niveles de lactato. Se definió fatiga metabólica si el nivel de ácido láctico al final de la intervención estaba por encima de 4 mmol/L. **Resultados** El 25.5% de los participantes terminó la simulación con un mal patrón de tolerancia metabólica. Las variables que predicen la fatiga metabólica son el nivel de actividad física y la masa ósea –en forma protectora- y la masa muscular. Las personas con un nivel bajo de actividad física tuvieron diez veces la probabilidad de fatiga metabólica comparadas con las de niveles más altos de actividad (44% versus 4.5%, respectivamente). **Conclusión.** Los profesionales que presentan un nivel de actividad física media o alta toleran mejor las labores de reanimación con un traje de protección biológica individual nivel D, en el caso de reanimación simulada.

Descriptores: reanimación cardiopulmonar; equipo de protección personal; umbral anaerobio; contención de riesgos biológicos; estrés fisiológico.

Fatiga metabólica em reanimadores usando equipamentos de proteção pessoal frente a riscos biológicos

Resumo

Objetivo. Descrever como afeta vestir um equipamento de proteção individual frente a riscos biológicos durante a realização de uma reanimação simulada. **Métodos.** Estudo quase-experimental não controlado no qual participaram 47 voluntários elegidos mediante uma amostragem aleatória estratificado por sexo e categoria profissional. Se realizou uma toma de concreta e de parâmetros antropométricos, assim como uma determinação basal de lactato; posteriormente, os voluntários vestiram um equipamento de proteção individual nível D frente a riscos biológicos e realizaram uma reanimação simulada durante 20 minutos; depois do desvestido e de 10 minutos de repouso se realizou outra extração de sangue para conhecer os níveis de lactato. Se definiu fatiga metabólica se o nível de ácido láctico ao final da intervenção estava por encima de 4 mmol/L. **Resultados** 25.5% dos participantes terminou a simulação com um mal padrão de tolerância metabólica. As variáveis que predizem a fatiga metabólica são o nível de atividade física e a massa óssea –em forma protetora- e a massa muscular. As pessoas com um nível baixo de atividade física tiveram dez vezes a probabilidade de fatiga metabólica comparadas com as de níveis mais altos de atividade (44% versus 4.5%, respectivamente). **Conclusão.** Os profissionais que apresentam um nível de atividade física média ou alta toleram melhor os trabalhos de reanimação com um equipamento de proteção biológica individual nível D, no caso de reanimação simulada.

Descritores: reanimação cardiopulmonar; equipamento de proteção individual; limiar anaeróbio; contenção de riscos biológicos; estresse fisiológico.

Introduction

In "conventional" resuscitation, health personnel must perform cardiopulmonary resuscitation techniques according to protocol.[1] However, the consequences of a cardiorespiratory arrest occurring in highly complex situations, such as an incident with biological hazard, are not known. The risk to health personnel necessarily implies the use of personal protective equipment (PPE). The recent Ebola virus epidemic in West Africa[2] has confronted health systems around the world with an alarming reality of biological hazard situations. It is increasingly common to attend numerous incidents - either provoked or unanticipated - that generate situations of collective emergency in which certain substances with biological hazard are implicated. These are situations that require a highly specialized response; in short: situations that must be handled comprehensively by the Emergency Services. The usual work of emergency teams is *per se* difficult, changing and often unfolding before a complex background. Professionals placed in such scenarios with diverse requirements must have received special attitudes and skills from education and training and in providing materials and resources.

The risk of a situation with biological hazard occurring is percentually low compared with other types of disasters,[3] but, due to its multiple and varied repercussions, the system must be specially prepared and trained. The various PPEs must represent the backbone of protective systems, the prevention of contagion and, by definition, the control of the situation. This type of incidents, despite currently being isolated cases, occur with certain frequency,[4] so we must be prepared to intervene in these scenarios. Most are caused either by accidental situations, or because appropriate safety measures for the handling or transport of certain substances have not been taken.[4] To these accidents we must add the possibility of terrorist acts; a situation that, unfortunately, is happening more frequently, as has been demonstrated in several attempts frustrated by the police worldwide in recent years.[5]

The use of PPE has improved both the assistance to victims and the survival of those involved in chemical or biological incidents, but this type of protection could otherwise reduce a person's operational capacity. When selecting protective equipment for biological and chemical preparation, a balance must be struck between the degree of protection necessary for the potential hazard in question and the resulting difficulty in carrying out user functions.[6] Performing their work in situations of biological hazard with the necessary level of protection directly affects the physiology of health workers, since it generates significant metabolic fatigue. This metabolic fatigue can increase the risk of accidents with PPE, increase cross-contamination, and lead to hasty termination of the procedures due to physiological stress, among others. Emergency services should contemplate these situations when planning interventions.[7]

Therefore, the question arises: Are all workers in the emergency services able to tolerate physiologically performing a resuscitation with PPE in the face of biological hazard? To answer this question, we selected a level of

lactic acid above 4 mmol/L at the end of the intervention as the parameter for the appearance of metabolic fatigue.[8] The objective of this study was to describe the effects of wearing individual protection equipment against biohazard when performing a simulated resuscitation.

Methods

Type of study and sample. An uncontrolled quasi-experimental study was performed in 2016 including 47 volunteers chosen through random sampling stratified by sex and professional category (doctors and nurses of the Hospital Emergency Services and Prehospital Emergencies) of an opportunity sample of 104 volunteers. We included professionals from the hospital emergency services of the University Clinic and Río Hortega University Hospital in Valladolid and professionals of the prehospital emergencies system of Castilla y León (mobile emergency units of: Palencia, Salamanca and Valladolid, both urban and rural) in Spain. We included voluntary participants between 22 and 65 years. Any volunteer who presented at least one of the following exclusion criteria was rejected: severe motor, visual or hearing impairment, acute phase skin disease, body mass index greater than 40 kg/m^2, systolic blood pressure below 80 mmHg and baseline heart rate above 150 bpm.

Environmental conditions and personal protective equipment used. All participants performed the same simulated clinical case, in the same diaphanous laboratory room of 20 m^2, with an average controlled temperature of 33.6±4.3ºC and an average controlled humidity of 51.1 ± 1.5%. All PPE elements used in the performance of the practice case conformed with European Community standards and had an instruction manual. Elements are listed in the order of placement: boot covers, protective overall, inner nitrile gloves, hood, FFP3 mask, panoramic and self-ventilated protective goggles and outer nitrile gloves.

Photo 1. Enactment of the emergency services with biological protection suits (Photo by Francisco Martín-Rodríguez)

Variables studied and measurement equipment. An anthropometric study was conducted to assess the following parameters: height, weight, body fat, muscle mass, bone mass, body mass index and total water content. For measuring the volunteers, we used a SECA® model 206 mechanical metric tape and for measuring weight and bio-impedance, we used a Tanita® precision scale model BC-601. The volunteers were asked to sit in a chair, roll up their sleeves and wait 5 minutes calmly, to have their vital signs taken: heart rate, systolic and diastolic blood pressure, respiratory rate, tympanic temperature, total hemoglobin, perfusion index, oxygen saturation and basal glycaemia. For determining systolic blood pressure, diastolic blood pressure and heart rate, we used a SCHILLER brand BP-200 plus meter. The temperature was measured with a tympanic brand BRAUN model ThermoScan PRO 6000 thermometer with ExacTemp technology. The values of total hemoglobin, oxygen saturation and perfusion index were obtained with a MASIMO model Pronto 7 multiparameter monitor, with software version b99e80000004ef796 (2.2.15), and revision version of sensor a83f90f0000c53f2, and glucose levels in blood with an Accu-Chek Mobile meter from Roche®. For determining lactic acid levels, we used an Accutrend® Plus meter from Roche® with a measuring range of 0.8-21.7 mmol/L, with three measurements: baseline determination, just after the volunteer perform the cardiac massage and once the case was concluded after 10 minutes of rest. In addition, each volunteer completed the IPAQ physical activity questionnaire.[9] The test has seven items with high reliability ($\alpha = 0.80$), suitable for people aged 15 and above. The full version of the questionnaire can be found on the website: www.ipaq.ki.se. The unit of measurement is called METs (unit of measurement of the metabolic index), and corresponds to the sum of the following activities: walking, moderate physical activity and vigorous physical activity. Once the physical activity questionnaire is completed, the volunteers are classified into three levels based on the exercise performed in the last seven days, as follows:[10] *high level*: vigorous physical activity at least 3 days per week achieving a total of at least 1500 METs, or 7 days of any combination of walking, with moderate physical activity and/or vigorous physical activity, achieving a total of at least 3000 METs; *moderate level*: 3 or more days of vigorous physical activity for at least 20 minutes per day, or 5 or more days of moderate physical activity and/or walking at least 30 minutes per day, or 5 or more days of any combination of walking, moderate or vigorous physical activity achieving a total of at least 600 METs; *low or inactive level*: not meeting any of the above criteria.

Development of the clinical simulation scenario. All participants in the study had the same information and the same materials and medical devices to solve the same case. The volunteers, guided by a biohazard specialist, had ten minutes to equip themselves completely, following by checking their suits. Once equipped with the PPE, they entered a room with controlled temperature and humidity and had to attend to a convulsing patient with possible biological hazard. After 10 minutes of simulation, the patient suffered a cardiac arrest and the volunteers had to perform a regulated resuscitation during 20 minutes. The total duration of the case inside the laboratory was 30 minutes. Once the practical case was completed, the PPE was taken off under supervision, and 10 minutes after the removal of the PPE, vital signs were taken again.

Statistical analysis. The qualitative variables are summarized with their frequency distribution, and the quantitative variables in their mean and standard deviation (SD). In all cases, the distribution of the variable was checked against the theoretical models; and, in the case of asymmetry, we calculated the median and its interquartile range (IQR). The association between qualitative variables was evaluated with the c^2 test or Fisher's exact test if more than 25% of the expected were less than 5. The behavior of the quantitative variables was analyzed for each of the independent variables categorized by the Student t test. We calculated mean absolute effects and their 95% confidence

intervals (95% CI). A logistic regression model was adjusted, in order to evaluate the association of those variables that predicted poor tolerance. This model allowed to identify the relationship between a set of explanatory variables and the probability of control of the variables studied. The calibration capacity of the model was evaluated with the Hosmer and Lemeshow test (p near 1 denoting high calibration). In all hypothesis contrasts, the null hypothesis was rejected with a type I error or alpha error of less than 0.05. The software package used for the analysis was SPSS version 20.0.

Ethical aspects. The study was approved on April 6, 2016 by the Clinical Research Ethics Committee of the Río Hortega University Hospital of Valladolid (Spain) with registration code #412016. All volunteers had to read and sign the informed consent document.

Results

Of 47 participants, 22 were men (46.8%) and 25 women (53.1%), with an average age of 40.2±8.7 years. By profession, 25 were nurses (53.1%) and 22 medical doctors (46.8%); 26 worked in hospital emergency services (55.3%) and 21 in prehospital emergency services (44.6%). On the IPAQ physical activity questionnaire, 25 participants presented a low level of physical activity (53.2%), 14 scored a moderate level of physical activity (29.8%) and 8 presented a level of high physical activity (17%).

Table 1 shows the mean values and standard deviation of the parameters at baseline and according to the final lactic acid values.

Table 2 shows that one in four participants concluded the simulation with an unfavourable metabolic tolerance pattern. No statistically significant differences were found in terms of poor metabolic tolerance due to sex or profession variables.

In contrast, statistically significant differences could be observed in the variables of life support training level in environments with biological hazard, where the proportion of subjects with fatigue was greater in the category with basic training (37.5%). By physical activity category performed in the last 7 days, participants with a low level had ten times the probability of metabolic fatigue compared to those with higher levels of activity (44% versus 4.5%, respectively).

We adjusted a multivariate logistic regression model in which the variables of professional group, workplace (hospital emergencies or prehospital emergencies), age, physical activity level, body mass index, muscle mass and bone mass were included. The prediction capacity of the model was very good, with an AUC of 0.901 (95% CI 0.81-0.99) and $p<0.001$.

The variables that predicted metabolic fatigue were the level of physical activity, muscle mass and bone mass. With decreasing physical activity and increasing muscle mass, tolerance worsened, whereas higher bone mass correlated with better tolerance (Table 3).

Table 1. Distribution of vital signs and anthropometric parameters at baseline and according to final lactic acid values

Variables	Baseline parameters		Final lactate				*p*-value
			<4 mmol/L		≥4 mmol/L		
	Mean	SD*	Mean	SD	Mean	SD	
Age (*years*)	40.2	8.7	39.3	9.3	42.9	5.8	0.210
Height (*cm*)	168.9	8.4	168.0	8.4	171.4	8.2	0.225
Weight (*kg*)	73.5	16.4	70.3	14.0	82.4	19.8	0.026
Body fat (%)	24.0	8.0	22.6	7.2	28.2	9.0	0.034
Muscle mass (%)	52.7	11.5	51.6	10.8	55.9	13.4	0.270
Bone mass (*kg*)	2.8	0.6	2.7	0.5	2.9	0.7	0.320
Body mass index (kg/m^2)	25.5	4.2	24.7	3.6	27.9	5.2	0.024
Total water (%)	55.7	5.5	56.8	4.9	52.5	6.3	0.018
Pulse (*bpm*)	79.4	12.6	78.8	13.0	81.3	11.4	0.553
Systolic arterial pressure (*mmHg*)	129.7	13.4	127.4	13.5	136.7	10.5	0.036
Diastolic arterial pressure (*mmHg*)	83.5	9.4	82.5	9.7	86.3	8.0	0.225
Respiratory rate (*rpm*)	16.2	1.7	16.1	1.8	16.6	1.5	0.365
Temperature (*ºC*)	36.5	0.5	36.5	0.6	36.4	0.5	0.945
Saturation (%)	98	1.5	97.9	1.6	98.4	1.2	0.280
Hemoglobin (*mg/dl*)	13.7	1.4	13.7	1.4	13.7	1.4	0.992
Perfusion (%)	3.6	2.9	3.5	2.7	3.8	3.6	0.755
Glycemia (*mg/dl*)	114.3	21.8	112.5	18.9	119.8	29.0	0.424
Baseline lactate (*mmol/L*)	2.3	1.4	2.2	1.2	2.5	2.1	0.587
Lactate during CPR (*mmol/L*)	9.4	5.2	8.2	5.1	12.7	4.1	0.006
Final lactate (*mmol/L*)	3.2	1.8	2.3	0.9	5.6	1.7	<0.001
Variation between final and baseline lactate (*mmol/L*)	1.0	0.40	0.17	1.35	3.03	2.11	<0.001

* Standard deviation

Table 2. Metabolic fatigue according to study variable categories

Variable	*n* (%)	*p*-value
Total (*n*=47)	12 (25.5)	-
Sex		
Male (*n*=22)	6 (27.3)	0.797
Female (*n*=25)	6 (24.0)	
Profession		
Nurse (*n*=25)	4 (16.0)	0.110
Doctor (*n*=22)	8 (36.4)	
Workplace		
Hospital emergency dept. (*n*=26)	8 (30.8)	0.360
Emergency services (*n*=21)	4 (19.0)	
Training level in life support in biological hazard conditions		
Without training (*n*=6)	1 (16.6)	0.001
Basic training (*n*=8)	3 (37.5)	
Advanced training (*n*=33)	8 (24.2)	
Level of physical activity		
Low (*n*=25)	11 (44.0)	0.008
Moderate (*n*=14)	1 (7.1)	
High (*n*=8)	0 (0.0)	
Level of physical activity		
low (*n*=25)	11 (44.0)	0.002
Moderate to high (*n*=22)	1 (4.5)	

Table 3. Variables for the logistic regression model to predict metabolic fatigue

Variables	Odds ratio	95% CI OR		*p*-value
		Minimum	Maximum	
Physical activity (intense or moderate compared to low)	0.02	0.00	0.45	0.013
Muscle mass (units)	6.59	1.29	33.75	0.024
Bone mass (units)	0.00	0.00	0.02	0.027

Discussion

With the generated predictive model, we know *a priori* with excellent reliability which professionals are going to conclude a cardiopulmonary resuscitation with more than 4 mmol/L of lactic acid in blood, an analytical value that characterizes the presence of metabolic fatigue, and value that insinuates the appearance of accidental errors of the workers and decrease in the quality or intensity of the maneuvers necessary for such a critical situation. The results of this study are especially relevant, since they allow establishing the profile of people who would inadequately tolerate the performance of a job with PPE against biological hazard. Knowing the possible behavior of workers at the physiological level, a more efficient selection can be made, and avoiding as much as possible situations of unnecessary risk in the interventions.

The anthropometric parameters behaved in the expected way in the face of physiological stress that requires increased physical activity to generate more bioavailable energy, with increases in muscle mass and water and decrease in body fat.[11] During any moderately intense or highly intense physical exercise (such as a resuscitation with a PPE against biological hazard), the blood pressure is increased to compensate the higher demand for energy. At the end of the exercise, a generalized vasodilatation results, and, as a consequence, a redistribution of blood, lowering blood pressure. After 5-6 minutes of concluding the exercise, the blood pressure decreases to the previous levels at rest, and the blood pressure decreases more to a level below baseline, maintaining this decrease for the following 5-6 hours.[12] The physiological model explains these variations, as a response to intense exercise and the release of catecholamines, leading to peripheral vasoconstriction and to blood redistribution.[13] We found no significant differences by sex, group or study subgroup among subjects with metabolic fatigue.[14] Regarding the variation of lactic acid, during exercise of high intensity and short duration, the organism does not have enough oxygen immediately available, and must get energy through less efficient routes that generate more metabolic waste (glycolytic metabolism).[15] Consequently, high levels of lactic acid form that decrease muscle capacity and the ability to generate energy, causing early fatigue.[16]

In this study, the lactate threshold direct correlated with the physical form of each subject, and revealed substantial differences between people with a high level of physical activity and people with a sedentary lifestyle.[17] In healthy people, we can observe an increase in the levels of lactic acid during exercise of high intensity and short duration (more so in less trained persons). Lactic acid is generated as a metabolic byproduct, becoming recycled as it originates, to a point where the body is unable to recycle lactic acid and it accumulates above 4 mmol/L,[15] exceeding the anaerobic threshold. Consequently, in high levels of lactic acid, the ability to generate energy decreases and muscle capacity decreases, appearing early fatigue.[18] In trained people, this threshold may be higher, and even more important, the capacity to recycle lactic acid is higher, so large quantities cannot accumulate.[19]

Many authors have evaluated the realization of techniques with protection equipment. Szarpak *et al*.[20] studied advanced airway management by paramedical personnel wearing protective suits; the same authors similarly compared the use of intraosseous puncture equipment with suit and without suit,[21] and the performance of conventional vascular access techniques with and without suit.[22] Another study by Szarpak *et al*.[23] evaluated the correct performance of external cardiac massage techniques on a mannequin by professionals in protective suits, evaluating the correct position, depth or quality, among other aspects, but none of these studies evaluated how this physical exertion affected the resuscitators. The study by Stein *et al.,*[24] which analyzes the reaction time of workers carrying PPE and their physiological response, should be highlighted. The authors describe and compare changes in heart rate, venous pH, pCO^2, bicarbonate, lactate level, oxygen saturation and temperature. They analyze the variations of these parameters in 19 healthy subjects, in two cases of 20 minutes

of exercise without protective equipment, and then the variation during 20 minutes of exercise wearing protective suits. The heart rate and temperature of volunteers in protective equipment were substantially more elevated than in control condition; however, due to the size of the sample, the results were not statistically significant.

If we combine the physiological overload that is caused by the use of specific protection equipment, together with the effort involved in resuscitation tasks, working with biological hazard protection equipment generates discomfort and decreases in the level of attention and response capacity.[24] These circumstances increase the probability of suffering occupational accidents and the risk of exacerbating pre-existing diseases, decreasing effective work time or generating work situations where it is impossible to perform the assigned tasks safely, for the patient, the healthcare worker themselves or the rest of the staff.[25]

Our research is limited to the study of the physiological and anthropometric parameters cited in the methodology, but the usefulness of other parameters such as cortisol, pH or insulin levels, among others, is not discussed. They were discarded from the study due to the complexity involved in measuring them; this limitation has to be taken into account in the study. Broader prospective studies are necessary in order to generalize the results and expand the parameters studied.

Hospital and pre-hospital emergency services must contemplate within their curricular design of competences the handling of incidents with biological hazard, be it as acts of chance or stemming from intentional terrorist acts.[26] Generally, we can affirm that the use of PPE against biological hazard is especially hard and arduous for workers, imposing a burden of additional physiological stress for the intervention.[27] It is easy to demonstrate that work with protective equipment against biological hazard complicates technical procedures; however, so far, no extensive studies have shown that the use of PPE requires highly intense physical effort that prohibits working for large time intervals.[28]

We can conclude that the parameters studied reveal a metabolic pattern of poor physiological tolerance after the use of individual protection equipment level D in the observed sample. Consequently, future studies could derive a predictive rule that allows us to assess which professionals may tolerate and adapt better to work in a biological incident.

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The Effect of Aerobic Exercise on Occupational Stress of Female Nurses: A Controlled Clinical Trial

Original article

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The Effect of Aerobic Exercise on Occupational Stress of Female Nurses: A Controlled Clinical Trial

Abstract

Objective. This work sought to determine the effectiveness of an aerobic exercise program on the occupational stress of nurses. **Methods.** Prevention-type controlled clinical trial carried out with the participation of 60 nurses working in hospitals affiliated to Shahrekord University of Medical Sciences in Iran. Randomly, the nurses were assigned to the experimental group or to the control group. The intervention consisted in an aerobic exercise program lasting three months with three weekly sessions one hour each. The Health and Safety Executive (HSE) questionnaire measured occupational stress with 35 questions, each with five Likert-type response options, which can have a maximum score of 175 points; higher scores meant lower levels of occupational stress. The HSE was evaluated during three moments: upon registering, after finishing the exercise program (week 8), and two months after terminating the intervention (week 16). **Results.** The

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level of occupational stress was the same in the experimental and control groups during registration (86.2 vs. 86.3). Upon finishing the aerobic exercise program (week 8), the experimental group showed a higher score than the control group (119.7 vs. 86.2, $p<0.01$), with this score diminishing after two months of having ended the intervention (91.4 vs. 85.8, $p=0.061$). Conclusion. The aerobic exercise program was associated to decreased work stress of nurses in the experimental group compared to the control group at eight weeks, but this difference did not persist when the experimental group did not continue with the program.

Descriptors: control groups; physical exertion; occupational stress; nurses; female.

Efecto del ejercicio aeróbico en el estrés ocupacional de mujeres enfermeras: Un ensayo clínico controlado

Resumen

Objetivo. Determinar la efectividad de un programa de ejercicio aeróbico en el estrés ocupacional de las enfermeras. **Métodos.** Ensayo clínico controlado de tipo preventivo que se llevó a cabo con la participación de 60 enfermeras que trabajaban en hospitales afiliados a *Shahrekord University of Medical Sciences* en Irán. Las enfermeras se asignaron aleatoriamente al grupo experimental o al grupo control. La intervención consistió en un programa de ejercicio aeróbico realizado durante dos meses con tres sesiones semanales de una hora de duración. El estrés ocupacional se midió con el cuestionario *Health and Safety Executive* (HSE) de 35 preguntas, con opciones de respuesta tipo Likert que van de 1 a 5; puede llegar a puntuar en 175 como máximo: a mayor puntaje, menor el nivel de estrés ocupacional. Se evaluó el HSE en tres momentos: en la inscripción, después de finalizar el programa de ejercicio (semana 8) y también dos meses después de terminada la intervención (semana 16). **Resultados.** Fue igual el nivel de estrés ocupacional en los grupos de intervención y de control en la inscripción (86.2 vs. 86.3), pero al finalizar el programa de ejercicios aeróbicos (semana 8) el grupo experimental mostró un puntaje mayor que el del grupo control (119.7 vs. 86.2, $p<0.01$), para luego disminuir este puntaje a los dos meses de haber finalizado la intervención, (91.4 vs. 85.8, $p=0.061$). Conclusión. El programa de ejercicio aeróbico se asoció a la disminución del estrés laboral de las enfermeras en el grupo de intervención en comparación con

el grupo control a las ocho semanas, pero esta diferencia no se mantuvo cuando el grupo experimental no continuó con el programa.

Descriptores: grupos control; esfuerzo físico; estrés laboral; enfermeros; femenino.

Efeito do exercício aeróbico no estresse ocupacional de mulheres enfermeiras: Um ensaio clínico controlado

Resumo

Objetivo. Determinar a efetividade de um programa de exercício aeróbico sobre o estresse ocupacional das enfermeiras. **Métodos.** Ensaio clínico controlado de tipo preventivo que se levou a cabo com a participação de 60 enfermeiras que trabalhavam em hospitais afiliados a Shahrekord University of Medical Sciences no Irã. Em forma aleatorizada, as enfermeiras foram designadas ao grupo experimental ou ao grupo controle. A intervenção consistiu num programa de exercício aeróbico realizado durante dois meses com três sessões semanais de uma hora de duração. O estresse ocupacional se mediu com o questionário Health and Safety Executive (HSE) de 35 perguntas, que tem opções de resposta tipo Likert que vão de 1 a 5, pode chegar a pontuação de 175 como máximo; a maior pontuação, é menor o nível de estresse ocupacional. Se avaliou o HSE em três momentos: a inscrição, depois de finalizar o programa de exercício (semana 8) e também dois meses depois de terminada a intervenção (semana 16). **Resultados.** Foi igual o nível de estresse ocupacional nos grupos de intervenção e de controle na inscrição (86.2 vs. 86.3), mas ao finalizar o programa de exercícios aeróbicos (semana 8) o grupo experimental mostrou uma pontuação maior que o do grupo controle (119.7 vs. 86.2, $p<0.01$), para depois diminuir esta pontuação aos dois meses de haver finalizado a intervenção, (91.4 vs. 85.8, $p=0.061$). Conclusão. O programa de exercício aeróbico se associou à diminuição do estresse profissional das enfermeiras no grupo de intervenção em comparação com o grupo de controle às oito semanas, mas esta diferença não se manteve quando o grupo experimental não continuou com o programa.

Descritores: grupos controle; esforço físico; estresse ocupaciona; enfermeiras e enfermeiros; feminino.

Introduction

In psychology, stress or psychological pressure means pressure, and force and any motivation that produces stress in human beings is called stressor or stressor factor. Rice[1] suggests that stress is the non-specific reaction of the body against any request; he points out that the objective of non-specific reactions is creation of physiologic equilibrium and adaptation. Stress leads to chronic diseases, like hypertension, cardio-vascular diseases, asthma, etc.,[2] Stress also affects the health of individuals, reduces quality of life, and increases the probable incidence of job-related injuries.[3]

Nowadays, occupational stress has become a prevalent problem in workplaces and few people have not faced such problems. The Princeton Survey Research Institute indicated that 75% of workers suffered from occupational stress compared with the past generation.[4] Occupational stress occurs when a person's expectations are more than his/her abilities.[5] Several occupational stressor factors exist, which could be divided into two groups of intra- and extra-organization. Factors related to the type of occupation, like workload, and group factors, such as lack of group support, are among the intra-organization factors and economic undesirable conditions and family environment are among the extra-organization factors.[6] Severe stress in the workplace causes much damage and expense to individuals, as well as organizations; occupational stress threatens the health of employees who are effective in productivity.[7] Currently, health and treatment are considered among the most important domains of permanent development of human societies and because they have a direct relationship with human health, healthy and lively nurses are needed.[8] According to the results from a research[9] on the effects of stressors in the workplace on nurses, 93% of the participants were regularly affected by the stressor factors of work environment. Among health staff, the nursing profession has been known as one of the occupations with high risk from the vantage point of fatigue and disease and the hospital environment can lead to stress and physical problems among nurses.

A study has reported that stress among nurses is at 42%,[10] given the occupational nature of the nurses who have a direct relationship with patients and their care, lack of awareness and exposure to such stress will result in some irreparable complications. The continuity or severity of stressor factors could cause occupational burnout among nurses. Empowering nurses to confront stressor factors, along with producing some conditions to reduce and eliminate such factors, could play an effective role in creating a peaceful working environment and increasing the capacity and efficiency of nurses.[6] A study with 1500 nurses working in 31 health centers in England[11] and who had applied for long leave considering considerable occupational stress, which was at 27%. Other nurses have suffered from depression and aggression after such conditions. A government census in England showed that the cause of 30% of leaves in health centers in this country was occupational stress

with yearly expenses > 400-million pounds, followed by loss of profitability and replacement of staff in these centers. Leaves and burnout due to occupational stress for nurses in Scotland and Thailand increased significantly in 2015. In research carried out in 2012 and 2013, about 38.0% of the staff in health centers reported suffering from severe stress. According to said research, 7.4% of the nurses were absent weekly due to occupational fatigue or stress-related inability, which is about 80.0% more than other occupational groups.[9] In Iran, the 2013-2015 census showed that more than one third of nurses suffered from poor mental health.[12] Some activities, like seeking help from others to do the work, looking forward to support from others; being realist; considering the situations; doing exercise; having an appropriate diet; getting enough sleep and rest; enjoying healthy recreation; taking trips; laughing; writing one's own thoughts and feelings; and having self-confidence are among the methods of coping with stress.[13]

According to Brunner and Suddarth, various methods exist for adaptation and each individual applies a specific method. These methods include relaxation, communication, deviation of senses, exercise, sufficient rest, eating, drinking, etc.[14] For this reason, using simple methods with no complication, like exercise, seems to play an important role in reducing stress. Currently, people look at exercise and physical activities not only as ways of spending leisure time, but also as an undeniable necessity for health.[13] The positive impacts of exercise and regular physical activities have been confirmed in several investigations with children, adolescents, youth, adults, and even the elderly.[15] Aerobic exercise is a series of muscular periodic and rhythmic movements, which increase respiratory and heart rate at a particular time.[16] Guszkowska[17] carried out a study on the effect of aerobic exercise on anxiety and depression and showed that exercise is effective in reducing anxiety and depression after 10 sessions and the anti-depression and anti-anxiety effects of exercise continue for one month after treatment. Another research also showed that physical activity can play a positive role in securing and providing mental health and is effective in reducing anxiety and depression, increasing mental health, and promoting quality of life.[18]

Some researchers have shown that exercise has a significant effect in reducing stress,[19] but some other studies, like that conducted by Sorensen *et al*.,[20] showed opposite results. Their study on the evaluation of the effect of exercise on police officers reported that no significant relationship existed between increased physical activity and reduced stress. Anyhow, no agreement exists indicating that perseverance and aerobic ability of the body and muscles can protect the individual against various stressors related to lifestyle or occupation. As mentioned, stress affects adversely the mental health of nurses. Considering the unavoidability of some stress factors in the nursing profession and the need to prevent the effects of physical and behavioral stress, taking some measures to improve the quality of life and teaching some coping strategies are among the responsibilities of managers to prevent their burnout and migration.

By reviewing databases, like Scopus and Pubmed, we found that no research exists on the effects of aerobic exercise on occupational stress of female nurses. In addition, most research has focused on studying the rate and reasons of stress among nurses[7] and interventions conducted to reduce their stress have mostly been educational workshops of short duration, with few interventions involving exercise programs.[19] Researchers sought to determine if a selected aerobic exercise program could play any role in reducing the stress of nurses, so that, by using these data, health-treatment planners and managers prevent the adverse effects of stress among nurses and increased costs of its non-observance. Therefore, the present research studied the effect of aerobic exercise on the amount of stress of nurses.

Methods

This was an interventional and clinical trial study. The population included 60 nurses working in

the hospitals affiliated to Shahrekord University of Medical Sciences in Shahrekord-Iran; they were selected purposefully and divided into two experimental and control groups after completing the questionnaire. The method used to categorize the two groups was block randomization with a size of four.

Inclusion criteria consisted of having at least one year of work experience, suffering occupational stress considering the HSE (Health and Safety Executive) occupational stress questionnaire, age limitation of 25 - 40 years, informed consent, along with non-existence of any type of disease, ability of engaging in exercise activity, lack of participation in any organized physical activity during the last two months and during research, and not enduring any severe stress during the previous six months. Exclusion criteria involved being absent for more than three continuous exercise sessions, being absent for more than six sessions during exercise sessions, and suffering unpleasant events (severe stressor accident) by the participant during the exercise sessions. Demographic information of the samples showed that demographic variables of the two control and experimental groups did not have any significant statistical difference.

The Health and Safety Executive (HSE) is a questionnaire used to determine occupational stress. This questionnaire includes 35 questions in seven domains (demand, control, responsible supports, colleague support, relaxation, role, and changes) and uses a 5-point Likert scale (never, seldom, sometimes, mostly, and always). Scoring is inverse so that high scores indicate higher health and security from the stress point of view and low scores show lower occupational stress. The reliability of this questionnaire was evaluated by Azadmarzabadi[21] using Cronbach's alpha method and split-half technique in 2010 (0.78 and 0.65, respectively). The convergent and discriminant validity of the questionnaire with a confidence interval of 0.95 in all parts of the questionnaire was reported in 68.0%. The scores of questions in each item represent the value measured for each item with a range of 1 to 5 variations in which 1 is undesirable and 5 is desirable, and higher scores represent more health and safety in terms of stress. Total score ranges from 35 to 175. Demographic questionnaire and medical history questionnaires were used to determine the demographic characteristics and medical history of the subjects, respectively.

The experimental group (30 subjects) started exercise by doing three sessions, each lasting one hour, per week for a period of eight weeks under the planned exercise program. Each educational session included warm-up with stretching exercises for a 15-min period and aerobic exercise with moderate severity equal to 60% - 70% of the maximum heart rate. The exercise lasted 35 min, consisting of a set of movements, like stepping, walking, jogging, skipping, kicking, and arm swimming movements, performed to music. Thereafter, 10 min of cooling down consisted of stretching movements of muscles in lower extremities (especially quadriceps femoris muscles, hamstring muscles, gastrocnemius muscles, and gluteus muscles) and muscles in upper extremities and 1-min relaxation of whole body. During each session, five Polar pulse meters, as chest belt, were used randomly to observe the exercise severity for individuals moderately. he data collected were analyzed by using the Statistical Package for Social Science (SPSS) version 19. Descriptive analysis was used to describe the quantitative and qualitative variables of both groups; furthermore, analysis of variance with repeated measurements was used to compare changes in scores of the HSE occupational stress questionnaire.

Results

Diagram 1 shows that the 27 individuals from the intervention group vs. 30 from the control group were analyzed during the following moments: immediately and two months after the intervention. The cause of the three losses in the study group was their not attending for three consecutive times to the exercise program sessions.

Diagram 1. Flow chart

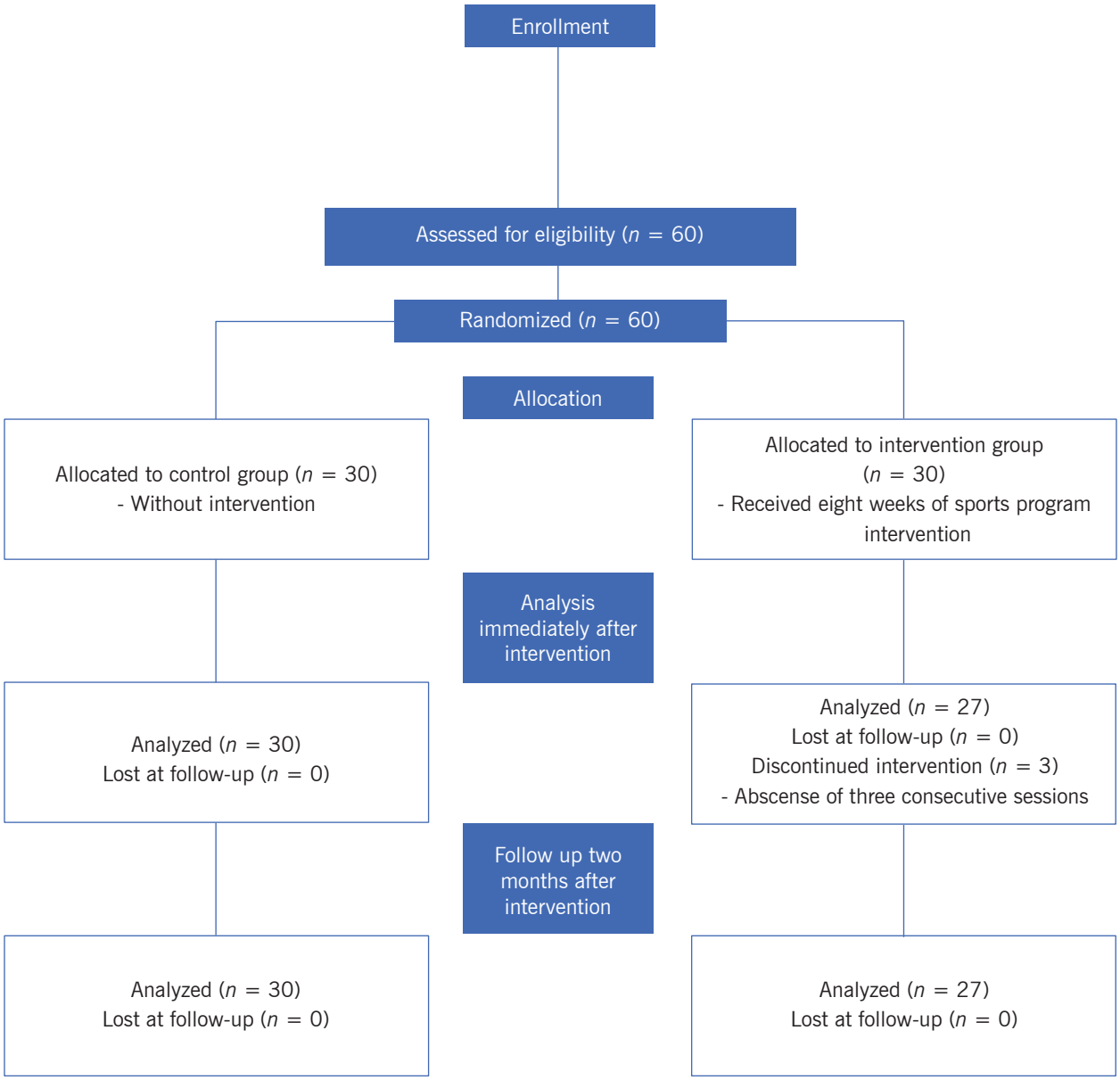

Table 1 shows that no statistically significant difference existed in the general characteristics of the study groups. The characteristics of the whole group prevailed with age between 31 and 40 years (61.4%, mean of 33±2.7 years), married marital status (70.2%), with one to two children (56.1%), monthly income from 5 to 10-million rial (59.6%), official or A treaty employment (31.6% each), with work experience between 6 and 10 years (36.8%), and Bachelor educational level (93%).

Table 2 shows that the HSE score in the control group was maintained in the three measurements. Rather, in the experimental group, the base HSE evaluation was equal to that of the control group, but immediately upon finishing the aerobic exercise program, the score was significantly higher than that of the control group (119.7 vs. 86.2). This score decreased after eight weeks of having finished the intervention, which, although higher than that found in the control group (91.4 vs. 85.8) this difference was not statistically significant.

Table 1. Comparison of demographic variables in control and intervention groups

Variable	Group		*p* value
	Control *n* (%)	Intervention *n* (%)	
Age			0.65
25-35	12 (40)	10 (37)	
31-40	18 (60)	17 (63)	
Marital status			0.24
Single	10 (33.3)	7 (25.9)	
Married	20 (66.7)	20 (74.1)	
Number of children			0.54
No children	10 (33.3)	6 (22.2)	
1-2 Children	17 (56.7)	15 (55.6)	
More than two children	3 (10)	6 (22.2)	
Monthly income			0.33
5-10-million rial*	19 (63.3)	15 (55.6)	
> 10-million rial	11 (36.7)	12 (44.4)	
Employment Status			0.21
Official	10 (33.3)	8 (29.6)	
A treaty	8 (26.7)	10 (37.0)	
Contractual	7 (23.3)	5 (18.5)	
Other	5 (16.7)	4 (14.8)	
Work Experience			0.32
1-5 years	9 (30)	10 (37)	
6-10 years	11 (36.7)	10 (37)	
> 10 years	10 (33.3)	7 ()	
Educational level			0.19
Associate Degree	1 (3.3)	1 (3.3)	
Bachelor	28	25 (93.3)	
Masters	1 (3.3)	1 (3.3)	

* 1 US Dollar = 42 105 rial

Table 2. Comparison of mean scores of occupational stress between both groups at various stages

Stage	Group	Mean ±SD	Mean Difference	t	DF	p value
Before intervention	Control	86.2±6.4	0.14	-0.062	55	0.95
	Experimental	86.3±5.7				
Immediately after intervention	Control	86.2±6.7	34.47	-10.39	55	<0.001
	Experimental	119.7±16.2				
Two months after intervention	Control	85.8±6.5	5.85	-1.93	55	0.061
	Experimental	91.4±13.9				

Discussion

The results, herein, demonstrated that the aerobic exercise program conducted for eight weeks is associated to diminished occupational stress, suggesting that this intervention should be kept over time. Among similar investigations, a study titled the "Effect of Regular Exercise on the Method of Coping with Problem-centered Stress in Nursing Students" was carried out by Dehghani *et al.*,[19] showed that by creating and protecting regular exercise behavior, we can enjoy the advantages of coping with stress and its negative outcomes, as well as its effect on the mental health of students. Another study on the effect of aerobic and non-aerobic exercise on the rate of anxiety by Purangbar *et al.,*[15] showed that anxiety in both groups of aerobic and non-aerobic exercise had significant decrease, compared with the control group. Therefore, we can conclude that exercise is an effective and safe way to reduce anxiety, and it seems that both aerobic and non-aerobic exercise could be effective in reducing anxiety. In addition, a study on reduction of pain and tension among hospital nurses after on-site massage treatments, carried out by Cooke *et al.*,[22] revealed that pain severity and tension was reduced significantly after the intervention.

The reason for such similarity may be the period of exercise, which was mostly eight weeks, and the type of samples who were mostly nurses. This could also be related to the physiological changes resulting from exercise activity. Physical exercise and activity cause the levels of some hormones to increase or decrease during exercise, compared with resting time. Catecholamines secreted from the central adrenal gland have a close relationship with the functions of Sympathetic Nervous System physiologically. Increased levels of Catecholamines are apparently important facilitators of exercise functions. Epinephrine and norepinephrine have various positive effects on cardio-vascular and metabolic systems of the body, considering their support role during exercise activities.[23]

The results of this research also showed that after eight weeks of aerobic exercise, a significant change in the occupational stress of nurses in the experimental and control groups was observed. This is an indication of the significant reduction of occupational stress after exercise and its subsequent increase two months after stopping exercise.

The results of our research are in the same line with some studies[15,19,22] that found the significant effect of exercise on stress and physiological changes of the body. For example, Abedian *et al*.[24] carried out a study to determine the effect of doing exercises on the rate of stress in midwives. In this study, the experimental group performed aerobic exercises at an intensity of 31% to 60% maximum oxygen consumption during 24 sessions for a period of 44 min, concluding that

exercise reduces the rate of stress. In contrast with the results from our study, Ayatinasab *et al.*[25] studied the effect of aerobic and Yoga exercise on the self-efficacy of female employees of Sabzevar University of Medical Sciences and stated that aerobic exercises did not create any significant change in the self-efficacy of the samples, while Yoga exercise caused a significant change in the variable. The authors suggested that Yoga exercise caused more increment in the nervous system equilibrium compared with aerobic exercise.

The short period of doing exercise is among the limitations of the research and exercising for longer periods is suggested. By paying attention to the stressor nature of the nursing profession, it is recommended that the authorities highlight the health of this group of the society by taking measures to prevent problems in the work environment, which threatens their health. It is also necessary to suggest that nurses should consider the important results of this research, which shows the relationship between health and exercise, pay more attention to exercise activity, and add such activities to their daily program.

Regular exercise could play an important role in improving the nurses' mental health by influencing the coping strategies and reducing the negative outcomes of stress. Therefore, paying attention to aerobic exercise by nursing managers is recommended to reduce stress in nurses.

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Pattern of Internet Use by Iranian Nursing Students. Facilitators and Barriers

Original article

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Pattern of Internet Use by Iranian Nursing Students. Facilitators and Barriers

Abstract

Objective. To evaluate the pattern of internet use and factors that facilitate or dissuade its use among nursing students from a university in Urmia, Iran. **Methods.** A cross-sectional, descriptive study was conducted with 162 nursing students selected through simple random sampling. **Results.** The findings indicated that 49.1% of the students used the internet from 15 to 60 min per day. The principal use of the internet was to search for scientific content in the Web. Factors that facilitated internet use were "ease of use" and "Access to experts to solve problems and answer questions", while the dissuasive factors were "lack of concentration", "cost of internet services", and preference for information provided by professors or available directly in textbooks. Internet use by the students was related with the use of this tool in classroom activities and with English fluency. **Conclusion.** Students have an internet use pattern aimed at self-study that should be strengthened with knowledge of English,

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assignments online, familiarization with the use of electronic databases, and other strategies to motivate them to use this technology with greater frequency.

Descriptors: computers; cross-sectional studies; information technology; information storage and retrieval; Internet; students, nursing.

Patrón de uso de la tecnología del Internet en estudiantes iraníes de enfermería. Facilitadores y barreras

Resumen

Objetivo. Evaluar el patrón de uso del Internet y los factores que facilitan o disuaden su uso entre los estudiantes de enfermería de una universidad en Urmia, Irán. **Métodos.** Se realizó un estudio descriptivo de corte transversal en 162 estudiantes de enfermería seleccionados a través de un muestreo aleatorio simple. **Resultados.** Los hallazgos indicaron que el 49.1 % de los estudiantes usaron Internet de 15 a 60 minutos por día. El principal uso del Internet fue la búsqueda de contenido científico en la Web. Los factores que facilitaron el uso de internet fueron la "facilidad de uso" y el "acceso a expertos para resolver problemas y responder preguntas", mientras que los factores disuasivos fueron la "falta de concentración", el "costo de los servicios de Internet" y la preferencia por la información suministrada por profesores o disponible directamente en los libros. El uso del Internet por los estudiantes estuvo relacionado con empleo de esta herramienta en las actividades del salón de clase y con el dominio del idioma inglés. **Conclusión.** Los estudiantes tienen un patrón de uso del Internet encaminado al auto-estudio que debe fortalecerse en conocimiento del idioma inglés, asignaturas en línea, familiarización con el uso de bases electrónicas y otras estrategias para motivarlos a usar esta tecnología con mayor frecuencia.

Descriptores: computadores; estudios transversales; tecnología de la información; almacenamiento y recuperación de la información; Internet; estudiantes de enfermería.

Padrão de uso da tecnologia da Internet em estudantes iranianos de enfermagem. Facilitadores e barreiras

Resumo

Objetivo. Avaliar o padrão de uso da Internet e os fatores que facilitam ou dissuadem seu uso entre os estudantes de enfermagem de uma universidade em Urmia, Irã. **Métodos.** Se realizou um estudo descritivo de corte transversal em 162 estudantes de enfermagem que foram selecionados através de uma amostra aleatória simples. **Resultados.** As descobertas indicaram que 49.1% dos estudantes usaram Internet de 15 a 60 minutos por dia. O principal uso da Internet foi a busca de conteúdo científico na Web. Os fatores que facilitaram o uso de internet foram a "facilidade de uso" e o "acesso à especialistas para resolver problemas e responder perguntas", enquanto que os fatores dissuasivos foram a "falta de concentração", o "custo dos serviços de Internet" e a preferência pela informação subministrada por professores ou disponíveis diretamente nos livros. O uso da Internet pelos estudantes esteve relacionado com emprego desta ferramenta nas atividades da aula e com o domínio do idioma inglês. **Conclusão.** Os estudantes têm um padrão de uso da Internet encaminhado ao auto-estudo que deve fortalecer-se em conhecimento do idioma inglês, matérias em linha, familiarização com o uso de bases eletrônicas, e outras estratégias para motivá-los a usar com maior frequência esta tecnologia.

Descritores: computadores; estudos transversais; tecnologia da informação; armazenamento e recuperação da informação; Internet; estudantes de enfermagem.

Introduction

Development of information technology and its use has had deep effects on different aspects of human life, including education. In recent decades, having access to information technology and the ability to use it, became an essential issue for those living in informational societies.[1] Educational systems globally have great needs to use information and communication technologies for education; meantime, the internet has gained a special position. Computers and internet, as educational technologies, can meet the information and research needs of students.[2]

Having knowledge and skills to use the internet, helps people to use information effectively; conduct searches, and produce and assess information. Information resources on the internet, such as databases, websites, and weblogs provide a positive environment for searching and studying. Additionally, they act as facilitators for interpreting, integrating, and applying knowledge in different fields of learning.[3] Numerous advantages of using the internet in research, communication and education have motivated universities and higher education institutions to provide accessibility to this massive network for their students and staff.

Some of the advantages of the internet network, like having access to information resources and scientific findings, sharing knowledge, scientific communication between scientists, distance learning, access to virtual libraries, etc., have made it more important than it was supposed. Furthermore, some limitations, such as financial limitations of universities, place and time limitations to access printed resources and libraries made the internet the easiest means of access to scientific information. Nowadays, access to traditional library catalogues and resources is possible through the internet.[4] Being familiar with computers and the internet is one of the essential competencies of nursing students that will be used to search for information through websites and software. Having computer and internet literacy is essential to gain learning goals.[5] Nursing students can use the internet and computer software for different goals, such as doing homework, preparing seminars, watching films, communicating with friends and instructors, searching for information to update knowledge and evidenced-based practices, and to use library databases.[6] These skills are also important for their future professional assignments. Therefore, proficiency in using internet technology (IT) is an essential need in nursing education. [5] Researchers believe that using IT must become a critical part of nursing education programs in the future.[7]

Acquiring internet skills is not only essential for nursing education and studies, but it is also important to help patients to look for suitable answers for their health questions. Nurses working in health care settings have a critical educational responsibility in guiding patients who increasingly access online resources of health information to make decisions.[8] Therefore, it is essential for nurses and nursing students to have access to online health databases

and also be familiar with informational resources to help patients and their families capture proper and reliable information.[9]

In recent years, several studies have been conducted to evaluate students' and instructors' knowledge and skills about using computers and the internet in different fields. As recommended by the findings, people in developed countries, in particular, use the internet to search for solutions to problems in their studies, and professional and personal matters. The popularity of the internet and its growing use among adolescents and youth is undeniable. These groups use the internet as their main source of information.[10] Results by different studies have indicated that using IT is related to a variety of factors, like age, sex, English fluency, computer and internet skills, feeling ease and comfort in using IT, among others.[4] Taking into account the results of the studies mentioned on the one hand and the key role of education in modern society, on the other hand, it seems that using IT in academic centers is essential. Considering the weight of using computers, the internet, and databases in performing scientific and practical activities, it is vital to assess the pattern of using computers and the internet in universities and the challenges in this field. The results may be helpful to facilitate and promote using this technology. Thus, this study is aimed at assessing the pattern of using computers and the internet, and its facilitators, and deterrents in nursing students.

Methods

This is a descriptive cross-sectional study on 169 nursing students in Islamic Azad University of Urmia, Urmia, Iran. The participants were selected through a simple random sampling using a table of random numbers of all nursing students, from October to December 2016. The sample size was determined based on similar studies,(6,11) with type I error of 0.05 and test power of 0.8.

The data-gathering tool was a researcher-designed questionnaire with 36 statements designed in three sections. The first section collected demographic and educational information, like age, educational level, place of residence, marital status, English fluency, and cumulative grade point average (GPA), calculated by dividing the total amount of grade points earned by the total amount of credit hours. The second section gathered information about using computers, places of access, and computer skills (e.g., typing, installing software, file management, and ability to understand software/hardware technical terms). Computer skills were assessed by using seven statements designed based on a Likert scale – excellent (5) to poor (1) – and obtainable score ranging from 7 to 35. The third part of the questionnaire collected data about using the internet, time spent on the net, place of access, extent of internet activities, facilitators and deterrents, and the mostly visited Iranian and non-Iranian websites.

The face validity and content validity of the questionnaire were confirmed by 10 experienced academic members (two assistant professors and eight instructors). The item-level content validity index (I-CVI) of almost all items was >0.8. Good reliability of the questionnaire was also ensured by using test re test (r=0.78).

The questionnaire was provided to the participants by the researcher and they were allowed to fill out the questionnaire anonymously. The participants were briefly introduced to the necessity and nature of the study, and were allowed to participate voluntarily. This study was approved by the Research Council and the Ethics Committee of the Urmia branch of Islamic Azad University, Urmia, Iran (Code: 35411).

The data gathered was analyzed in SPSS (22) using descriptive and analytical statistical tests, such as mean, standard deviation, and correlation test.

Results

All the participants were female with mean age of 21±0.7. The majority of the participants (75.5%) were single and 49.7% had mediocre financial status. Average GPA of the participants was 15.90±9.2 and more than half of them

(57.7%) reported not having good command of English.

The findings showed that about 51.5% of the students had passed computer courses and 52.1% of them had mentioned that they had adequate access to computers in their faculty. With regard to access to the internet, most of the participants (54.2%) used high-speed internet at the Faculty of Midwifery and Nursing. As far as access to computers and the internet in the dormitories, 22.1% had no access to computers and 30% had no access to the internet. The average time spent on the computer was 6.7±8.7 h per week and the participants' file management skills (copying, saving, creating, deleting, and printing) was greater than their other computer operating skills; and their skills on security of computers against viruses, hackers, and others were lower than the other computer operating skills (Table 1).

In using the Internet, 49.1% of the participants mentioned that they tend to be online around 15 to 60 min every day. In addition, 70.6% of the participants reported using the internet before entering the university and a large group of the participants (83%) expressed their need for further internet training. For searching in the internet, 31.9% mentioned that they had learned it from their families, 19.5% learned it through self-learning, 15.3% participated in non-academic training courses, 14.7% learned it from their classmates; and only 9.2% participated in academic training courses. The majority of the participants (58.3%) stated that they were mostly online at home and 23.9% mentioned they tended to use the internet in the Faculty. As to the purpose for using the internet, searching for scientific material was at the top and using video-chat was at the bottom (Table 2).

Amongst the Iranian and non-Iranian websites, the Scientific Information Database (SID) (22%) and Google (86%) were the websites visited most. The main facilitating factors in using the internet were "ease and comfort in using the internet" and "Access to experts to solve probable problems and answer probable questions", however, "lack of concentration in using the internet", "internet connection problems" and "cost of internet services" were the main deterrents (Table 3).

Computer and Internet skills were significantly related to command of English, time spent on the computer, time spent on the internet, and using the internet as part of the curriculum, but these had no association with the GPA (Table 4).

Table 1. Mean score of the participants' computer and internet skills

Skills	M±SD
Computer skills	
File management (copying, saving, creating, deleting, and printing)	3.20± 1.25
Typing and using the keyboard	2.98± 1.20
Troubleshooting simple malfunctions	2.61± 1.11
Using accessories, such as printer, scanner, etc.	2.29± 1.25
Understanding hardware/software technical terms	2.25± 1.07
Installing new software	2.22± 1.30
Protecting computer against viruses, hackers' attacks, and others	2.14± 1.15
Internet skills	
Working with search engines: Yahoo and Google	4.68± 1.52
Saving information from the internet in the computer	4.33± 1.50
Checking e-mails	4.11± 1.97
Searching for articles and books	4.11± 1.54
Sending e-mail	3.68± 1.92
Signing up	3.60± 1.99
Attaching files to e-mail	3.44± 1.93
Using chat rooms	3.30± 1.76
Using e-libraries	3.28± 1.99

Table 2. Average time spent on the internet for different purposes

Different tasks	M±SD
Searching for scientific material	3.45±1.20
Personal interests	3.42±1.09
Searching for general material	3.01±1.19
Doing research work	2.95±1.28
Checking e-mail	2.79±1.53
Searching for technical information	2.77±1.24
Entertainment	2.75±1.32
Checking news	2.24±1.18
Downloading software	2.32±1.36
Chatting	2.08±1.45
Marketing and searching for products	1.94±1.21
Checking seminars and scientific events	1.68±0.94
Video chat	1.58±1.05

Table 3. Facilitators and barriers in using the internet

	M±SD
Facilitators	
Ease and comfort using computers and the Internet	2.50±1.13
Access to experts to solve probable problems and answer probable questions	2.37±1.32
Adding internet training to the curriculum	2.32±1.30
Introduction of useful websites by the professors and friends	2.26±1.12
Familiarity with computers	2.24±1.31
Holding internet training courses in the Faculty	2.24±1.29
Feeling the need to use the internet	2.22±1.13
Availability of a computer facility with internet connection in the faculty/hospital	2.16±1.16
Having adequate knowledge about how to do a search on the internet	2.16±1.15
Barriers	
Lack of concentration in using the internet	3.08±1.67
Internet connection problems (low connection speed, disconnections, and etc.)	2.39±1.23
Cost of internet services	2.60±1.33
Preference for information collected from professors and experts	2.03±1.60
Preference to collect information from books and journals	1.77±0.42
Necessity to reserve internet in the university	1.93±0.25
Lack of self-confidence in using the internet	1.93±0.20
Distrust in the online information	1.92±0.26
Not feeling the need to use the internet	1.90±0.30
Disconnection	1.87±0.33
Lack of sufficient access to the internet	1.82±0.37
Failure to find the needed materials on the internet	1.81±0.38
Limits and restrictions on time using the internet	1.78±0.41
Lack of sufficient skills and experience in using computers and the internet	1.77±0.42
Lack of adequate time for internet surfing	1.70±0.45

Table 4. Correlation between the internet and computer skills and educational variables

Educational Variables	Internet skills		Computer skills	
	p	*r*	*p*	*r*
Grade point average	0.76	0.03	0.48	0.06
English fluency	<0.001	0.48	<0.001	0.52
Time spent on the computer	<0.001	0.38	<0.001	0.26
Time spent on the internet	0.03	0.24	<0.001	0.26
Using the internet as part of classroom activities	<0.001	0.49	<0.001	0.56

Discussion

In the present study, the IT use pattern, as well as its facilitators and deterrents in the Nursing and Midwifery Faculty students from the Islamic Azad University of Urmia were examined. Based on the findings, the participants stated that access to computers and the internet in the Faculty was adequate, while most of them did not have access to computers and the internet in the dormitories. Saeidi *et al*.,[11] conducted a study on nursing students and reported that 44.8% had access to computers and 47.6% access to the internet, which was an acceptable access level to these facilities. Similar to our results, Kumar *et al.*[12] reported an access level of 59.9% to computers among students, while this figure in the work by Abtahi *et al*.,[13] was 33%. Access to the internet in Jamshidi *et al.*,(14(and in Jadoon *et al*.,[15] was 63.5% and 83.97%, respectively. Saeidi *et al.*,[11] argued that these findings indicate high level of access to computers and the internet in societies and that level of access to online information was a necessity of modern life, especially for students. The findings of the present study showed that most of the participants used the Google search engine, which is in line with Saeidi *et al*.,[11] Scott *et al*.,[16] and Maleki *et al.*[17] User friendly interface and variety of capabilities of the Google search engine makes it the first choice for most internet users to search for information on the internet.

As to the purposes for using the internet, the participants mentioned searching for scientific material as the main purpose and video chat as the lowest priority in using the internet. Saeidi *et al*.,[11] reported that searching for scientific articles was the main activity of the subjects on the net and checking e-mail was the least important activity. In today's world, the internet has become one of the main tools to access information. Along with its rapid expansion in our personal lives, the internet has brought substantial change in academic and research activities.

Increased computer and internet usage has influenced medical education, too. The Internet has made medical knowledge accessible for everyone around the world.[18] Unnikrishnan *et al*.,[19] also reported that most students use the internet for searching, obtaining general information, and for fun. The study by Marrof *et al*.,[20] showed that the greatest use of the internet was for communicating with others and for fun; and only one fiftens of the participants used the internet to search for articles. Jadoon et al.,[15] showed that 61% of the paricipants used the internet for personal and academic activities and only 11% used the internet merely for academic activities.

Our results showed that the majority of the participants had learned internet surfing via their family, self-learning, attending nonacademic courses, classmates, and academic courses held at the university. Mashhadi *et al*.,[21] showed that friends and colleagues, self-learning, and self-study were the main ways of learning how to use the internet. Sajadi *et al.*,[22] noted that most of the participants had obtained internet skills outside the academic environment. Shirazi *et al*.,[23] also indicated that nursing students performed different activities, such as interaction with others to construct their knowledge through their self-directed learning. Although it is possible to learn how to use computers and the internet through self-study and self-learning, the professional use of these tools certainly needs education. It is necessery to schedule regular classes under the suprevision of experienced instructors at schools.

The results showed that computer and internet skills were significantly related to the users' knowledge of English, time spent on the computer and the internet, and using the internet as part of the curriculum. However, there were no significant relationships between age and educational performance and other variables. Asadi *et al.*,[24] reported that the number of areas using IT, as required by professors, was significantly related to the knowledge and skills of using computers, Internet, and command of English. Saeedi *et al.*,[11] showed that internet and computer skills were significantly related to the time spent on computers and the internet. Mashhadi et al.,[21] found in their study that age, computer and Internet using skills, and command of English were significantly related to using IT.

Given that it is inevitable to know English to interact with computers and every user who starts to work with computers will be familiar with numerous idioms, knowledge of English and skills will influence on computer litracy and will make it easy for users to work with computers.[25] Additionally, the results of Rahimi's study showed a positive meaningful relationship between the skills of English reading and internet searching. In their researh, individuals who were more proficient in English reading, used more the behavioral strategies, such as ensuring the process of searching, correct routing, and using advanced searches. They also used metacognitive strategies, like continuous assessment of information, selecting the main tiltles on webpages, following hyperlinks, and making decisions about saving and using more information.[26]

Our participants noted that the main facilitators in using the internet, in descending order, were ease and comfort in using computers and the internet, access to experts in case of any problems or questions, having internet courses as part of the curriculum, introduction to useful websites by professors or friends, and knowledge in using computers. Saeidi *et al*.,[11] listed the facilitators, in descending order, as feeling peace and ease of using computers, interest in using computers and the internet, computer and internet skills, good command of English, and access to experts in computer and internet fields in case of problems.

As for the deterrent factors in using the internet, distractions and lack of concentration while using the internet, internet connection problems (low speed, frequent disconnection, etc.,), internet costs, more reliability of the information provided by professors, books, and journals were mentioned in descending order by the participants. Jadoon *et al*.,[15] indicated that lack of time, inadequate number of available computers, and lack of support from the staff were the most common problems faced by students while accessing the internet in the institution facilities. In the study by Jafari and Diani,[4] the most important barriers for internet use were mentioned as: no internet access, being unfamilar with searching skills, lack of personal computers, high expense, failure of telecommunication lines, low-speed internet, and lack of need. Saeedi *et al*.,[11] mentioned low speed of internet connection, lack of access to a suitable computer, poor knowledge of information databases, lack of information searching skills, and poor English knowledge as the main problems of using the internet. Rihlert *et al*.,[27] indicated some other factors, like unfamiliarity with websites and lack of knowledge about the use of databases, as the most important barriers of internet use. Given the above, one may argue that having proper infrastructure to guarantee reliable access to the internet, decreased costs of internet connection, and holding training classes can motivate students to use the internet to find the latest scientific materials.

Conclusion. In summary, it appears that learning how to use computers and the internet can be through self-practice and self-study, while professional use needs passing training courses. Therefore, there is a need for holding routine training courses in academic and scientific manner by experienced instructors. In addition, some courses can be designed as self-study and online education as a way to motivate students to use computers and the internet more often. Providing access to high-speed internet, regular training, and having updated information about computers, e-data sources, and information banks also promotes using the internet among students. Having access to experts in the fields of internet search can also be helpful for those facing problems with working with the internet. Given the key role of English knowledge, English courses should be followed more seriously in nursing faculties by designing more efficient courses. Future works should be conducted as experimental studies to examine the role of deterrents and facilitators in using computers and the internet.

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Effectiveness of a Nursing Intervention to Diminish Preoperative Anxiety in Patients Programmed for Knee Replacement Surgery: Preventive Controlled and Randomized Clinical Trial

Original article

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Effectiveness of a Nursing Intervention to Diminish Preoperative Anxiety in Patients Programmed for Knee Replacement Surgery: Preventive Controlled and Randomized Clinical Trial

Abstract

Objective. This work was conducted to determine the effectiveness of a nursing intervention, based on the motivational interview, to diminish preoperative anxiety in patients programmed for knee replacement surgery. **Methods.** Preventive type controlled and randomized clinical trial, on a sample of 56 patients programmed for knee replacement surgery in a clinic in Girardot (Colombia). Random assignment was made: an intervention group (n=28) and a control group (n=28). The six-question Amsterdam Preoperative Anxiety and Information Scale was applied before and after the intervention. The scale has a total score ranging from 5 to 30; the higher the score, the greater the preoperative anxiety. The nursing intervention was conducted in three sessions of

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motivational interview each lasting 40 min, during the six weeks prior to the surgical procedure; the control group received conventional management of education in the health institution. **Results.** The mean score of preoperative anxiety was equal in the pre-intervention evaluation in both groups (19.76 in the experimental versus 22.02 in the control =22.02; $p<0.226$), while during the post-intervention, the anxiety score was lower in the intervention group compared with the control group (15.56 and 20.30, respectively; $p<0.013$). **Conclusion.** Nursing intervention based on the motivational interview was effective in diminishing preoperative anxiety in patients programmed for knee replacement surgery.

Descriptors: anxiety; arthroplasty, replacement, knee; control groups; motivational interview; orthopedics; perioperative nursing.

Efectividad de una intervención de enfermería para la disminución de la ansiedad preoperatoria en pacientes programados para cirugía de reemplazo de rodilla: Ensayo clínico preventivo controlado y aleatorizado

Resumen

Objetivo. Determinar la efectividad de una intervención de enfermería basada en la entrevista motivacional, para disminuir la ansiedad preoperatoria en pacientes programados para cirugía de reemplazo de rodilla. **Métodos.** Ensayo clínico controlado y aleatorizado tipo preventivo, en una muestra de 56 pacientes programados para cirugía de remplazo de rodilla en una clínica en Girardot (Colombia). Se asignaron en forma aleatoria: un grupo de intervención ($n=28$) y un grupo de control ($n=28$). Antes y después de la intervención, se aplicó la escala de seis preguntas, APAIS (The Amsterdam Preoperative Anxiety and Information Scale), la cual tiene un puntaje total que va de 5 a 30: a más puntaje, mayor la ansiedad preoperatoria. La intervención de enfermería se desarrolló en 3 sesiones de entrevista motivacional con una duración de 40 minutos, durante las 6 semanas anteriores a la realización del procedimiento quirúrgico. El grupo de control recibió el manejo convencional de educación en la institución de salud. **Resultados.** La media del puntaje de ansiedad preoperatoria fue igual en la evaluación preintervención en los dos grupos (19.76 en el experimental versus 22.02 en el control = 22.02; $p<0.226$), mientras que en la posintervención el puntaje de ansiedad fue menor en el grupo de intervención comparado con el grupo control (15.56 y 20.30, respectivamente; $p<0.013$).

Conclusión. La intervención de enfermería basada en la entrevista motivacional fue efectiva en la disminución de la ansiedad preoperatoria en pacientes programados para cirugía de reemplazo de rodilla.
Descriptores: artroplastia de reemplazo de rodilla; grupos control; entrevista motivacional; ortopedia; enfermería perioperatoria.

Efetividade de uma intervenção de enfermagem para a diminuição da ansiedade pré-operatória em pacientes programados para cirurgia de prótese de joelho: Ensaio clínico preventivo controlado e aleatorizado

Resumo

Objetivo. Determinar a efetividade de uma intervenção de enfermagem baseada na entrevista motivacional, para diminuir a ansiedade pré-operatória em pacientes programados para cirurgia de prótese de joelho. **Métodos.** Ensaio clínico controlado e aleatorizado tipo preventivo, numa amostra de 56 pacientes programados para cirurgia de prótese de joelho numa clínica em Girardot (Colômbia). Foram designados em forma aleatória: um grupo de intervenção ($n=28$) e um grupo de controle ($n=28$). Se aplicou antes e depois da intervenção, a escala de seis perguntas, APAIS (The Amsterdam Preoperative Anxiety and Information Scale), a qual tem uma pontuação total que vá de 5 a 30 a mais pontuação, é maior a ansiedade pré-operatório. A intervenção de enfermagem se desenvolvimento em 3 sessões de entrevista motivacional com uma duração de 40 minutos, durante as 6 semanas anteriores à realização do procedimento cirúrgico; o grupo de controle recebeu o manejo convencional de educação na instituição de saúde. **Resultados.** A média da pontuação de ansiedade pré-operatória foi igual na avaliação pré-intervenção nos dois grupos (19.76 no experimental versus 22.02 no controle = 22.02; $p<0.226$), enquanto que na pós-intervenção a pontuação de ansiedade foi menor no grupo de intervenção comparado com o grupo controle (15.56 e 20.30, respectivamente; $p<0.013$). **Conclusão.** A intervenção de enfermagem baseada na entrevista motivacional foi efetiva na diminuição da ansiedade pré-operatória em pacientes programados para cirurgia de prótese de joelho.

Descritores: ansiedade; artroplastia do joelho; grupos controle; entrevista motivacional; ortopedia; enfermagem perioperatória

Introduction

Progress in the nursing profession regarding caring for people within surgical services is evident; clear examples of this are noted in the safety policy for surgical patients,[1] good sterilization and instrumentation practices in the operating room, and nursing interventions in favor of patient safety and decreased risks associated to anesthesia and surgery.[2] However, in spite of these transcendental breakthroughs, work has not been sufficient on the emotional responses of patients upon a surgical procedure. This type of event becomes a powerful stressor of complex nature for the individual, given that the process depends not only on the hospitalization, but also on the events and consequences generated on the environment prior, during, and after surgery.[3] The surgical environment causes fear and anxiety regarding the surgery or the hospital stay.[4] All these responses can produce side effects to the treatment and possible isolation of patients in their social and family setting, subsequently generating physical and psychological affectations to the point of being able to impact upon a chronic disease. associated with perioperative complications, or even due to the socioeconomic impact by increasing post-surgery morbidity.[5] In this respect, emotional responses of surgical patients have been reported, like anxiety by 72%, fear by 68.5%, and tension by 59.0%, which implies the impact it may have upon a person when entering the surgical room.[6]

Specifically, anxiety emerges weeks prior to the surgical event and symptoms intensify during the hours prior to admission, which produces physiological and emotional effects upon surgery, a fundamental reason to provide preoperative information before patients enter the operating room. Upon addressing the phenomenon of preoperative anxiety in surgical patients, it is evident that such persist up to 12 h during post-surgery and is accompanied by manifestations, like: high blood pressure, diaphoresis, or headache (in spite of having had initial treatment with anxiolytics), which can delay recovery and prolong the hospital stay.[7] In spite of this impact generated by anxiety, literature shows that from nursing, strategies have been implemented to diminish it in this context, providing verbal information of the surgical procedure or by using pre-surgical kits in elective surgeries (like, inguinal or umbilical hernias, tonsillectomy, adenoidectomy or circumcision).[8] Other relaxation techniques implemented for surgical procedures are reported in studies with surgery patients due to breast cancer, patients with fibroadenoma or with fibrocystic disease, achieving decreased anxiety in many cases.[9]

Globally, the number of surgical procedures has increased. According to the World Health Organization,[10] annually around the world over 4-million patients are subjected to surgery and it is estimated that 50% to 75% develop some degree of anxiety during the preoperative period. In the same sense, anxiety is considered a public health problem, given that it affects 10% of the global population, hindering the work of the health staff in the recovery

of the subject, with regards to the treatment guidelines employed.[11] The aforementioned manifests the risk patients are exposed to and the need to diminish it through prevention strategies. Specifically, the person experiences more anxiety just before the surgery, especially while awaiting for the intervention and in part due to the circumstances surrounding this event.[12] Due to this, it is proposed that the person who will be surgically intervened must have the motivational interview during the preoperative period, a concept developed by Miller and Rollnick.[13] It consists in a type of patient-focused clinical interview, whose purpose is that of exploring and solving ambivalences about a behavior or unhealthy habit to, thus, promote changes toward healthier lifestyles. The motivational interview enables patient positioning toward the desire for change and helps them to recognize and care for their current and future problems enhancing their perception of self-efficacy.[14] To conduct it, it is indispensable to identify the patient's motivational stage to propose and develop different actions that potentiate motivation upon the behavioral change.[15]

From this vantage point, the role of nursing in participating in the preoperative assessment is fundamental when exploring anxiety, as of the motivational interview. Because of the aforementioned, research was conducted to determine the effectiveness of a nursing intervention based on the motivational interview in diminishing preoperative anxiety in individuals programmed for knee replacement surgery.

Methods

Study design. This was a preventive type controlled randomized clinical trial.

Participants. The population involved individuals programmed for knee replacement surgery in a tier III specialized clinic in the city of Girardot (Colombia), who were admitted to preoperative assessment, during the period comprised between January 10 and April 30, 2018. The inclusion criteria included people ranging in age between 50 and 75 years, patients programmed in the institution for knee replacement under two months from the procedure, and the patients' acceptance to participate in the study. The exclusion criteria were: individuals with intellectual cognitive disability (behavioral-cognitive intervention), individuals programmed for a surgical procedure different to arthroplasty or knee replacement, and the patient's refusal to participate in the research. This trial is inscribed in the Brazilian registry of clinical trials (REBEC, for the term in Portuguese): Trial: (Req: 7545, Effectiveness of a Nursing Intervention to Reduce Preoperative Anxiety).

Intervention. To carry out the intervention, participants from the experimental and control groups received an individual and informative session by nursing on the surgical preparation and the procedure. On the first visit, a deliberate questionnaire was applied, to identify the patient, general characteristics, and verify compliance with the criteria. The control group received the habitual treatment, while the experimental group received, besides the habitual, the motivational interview. Prior to performing the trial, both groups were applied the Amsterdam Preoperative Anxiety and Information Scale (APAIS), which is based on a six-item questionnaire (I am worried about the anesthetic; The anesthetic is on my mind continually; I would like to know as much as possible about the anesthetic; I am worried about the procedure; The procedure is on my mind continually; and I would like to know as much as possible about the procedure), with response options evaluated in a Likert-type scale from 1 to 5; one meaning not at all and 5 extremely. The first two relate to anxiety due to the anesthetic, numbers four and five relate to anxiety due to the surgery and the sum is considered as preoperative anxiety that can vary from 5 to 30 points. The APAIS has validity and reliability with a Cronbach's alpha internal consistency of 0.84.[16] The APAIS was applied by two nursing professionals, as evaluators, at the start and end of the procedure.

Three sessions of the motivational interview were conducted within a 20-day period and, thereafter, the follow up took place four weeks later. The motivational interview sessions are mainly based on participants establishing their own goals to slowly change their lifestyles. Each session lasted approximately 40 min, which began by exploring their level of anxiety and the triggering factors during the eight days prior to the interview.

Sample size. A sample of 56 subjects was calculated, distributed randomly ($n = 28$) for the intervention group and ($n = 28$) for the control group, bearing in mind the inclusion criteria and 95% CI, power of 80%, margin of error ± 4.4%, and a maximum proportion of 52.4% of patients in the experimental group who would improve anxiety compared to 47.6% in the control group. Patient selection was carried out randomly by sequence generation, using a list of numbers registered in the database according to the numerical codes assigned by the researcher upon entering the study. The final sample included 55 patients: 28 in the intervention group and 27 in the control group because of the voluntary withdrawal of one patient in this last group.

Assignment reservation. Patients complying with the inclusion criteria were scheduled in the consultation service. The researcher proceeded to make the assignment through identification codes of the participants. Thereafter, the participants were assigned to each group, using a computer-generated random table. To hide the assignment, it was serially numbered, keeping a printed copy of the software-generated sequence. Contamination of the study was controlled by guaranteeing that it was conducted in personalized manner in different sites and days, to keep participants from sharing the information with each other.

Masking. This was a double-blind study in which participants ignored to which group they had been assigned and the professional nurses, considered evaluators, ignored the selection of patients and the random assignment. In addition, they did not participate in the intervention.

Data analysis. A prior descriptive analysis was conducted to identify differences in the general characteristics of the groups studied; Student's t test was used for means of the quantitative variables and the Chi squared for proportions. To evaluate changes in the APAIS scores between the initial and final moments intra-subject, and study intergroup used ANOVA with repeated measures. Mauchly's W was used to assess if the variances-covariances matrix was spherical. When the assumption of sphericity was fulfilled, the F test was used, which indicated whether to accept or reject the hypothesis of equality between the study groups in the APAIS score during both assessment moments. The contrast used in this procedure is of polynomial type to the factors of repeated measures, which permitted studying the relationship between the factor (study group) and dependent variable (APAIS score) is linear.

Ethical aspects. This research was approved by the Ethics Committee at Universidad Nacional de Colombia and the research committee of the institution where the study took place. Previo a su participación se solicitó de manera voluntaria and por escrito, el consentimiento informado a los participantes en el estudio and la confidencialidad de la información.

Results

This study recruited 196 patients of which 140 were excluded because they did not comply with the requirement of knee replacement surgery and 133 did not comply with the inclusion criteria (Figure 1); for a total of 56 participants, distributed 28 in each group (experimental and control). One of the participants in the control group was excluded due to voluntarily withdrawing from the study during the second week of the nursing intervention. At the end of the study, the sample comprised 28 patients in the intervention group and 27 patients in the control group.

Figure 1. Study flow diagram

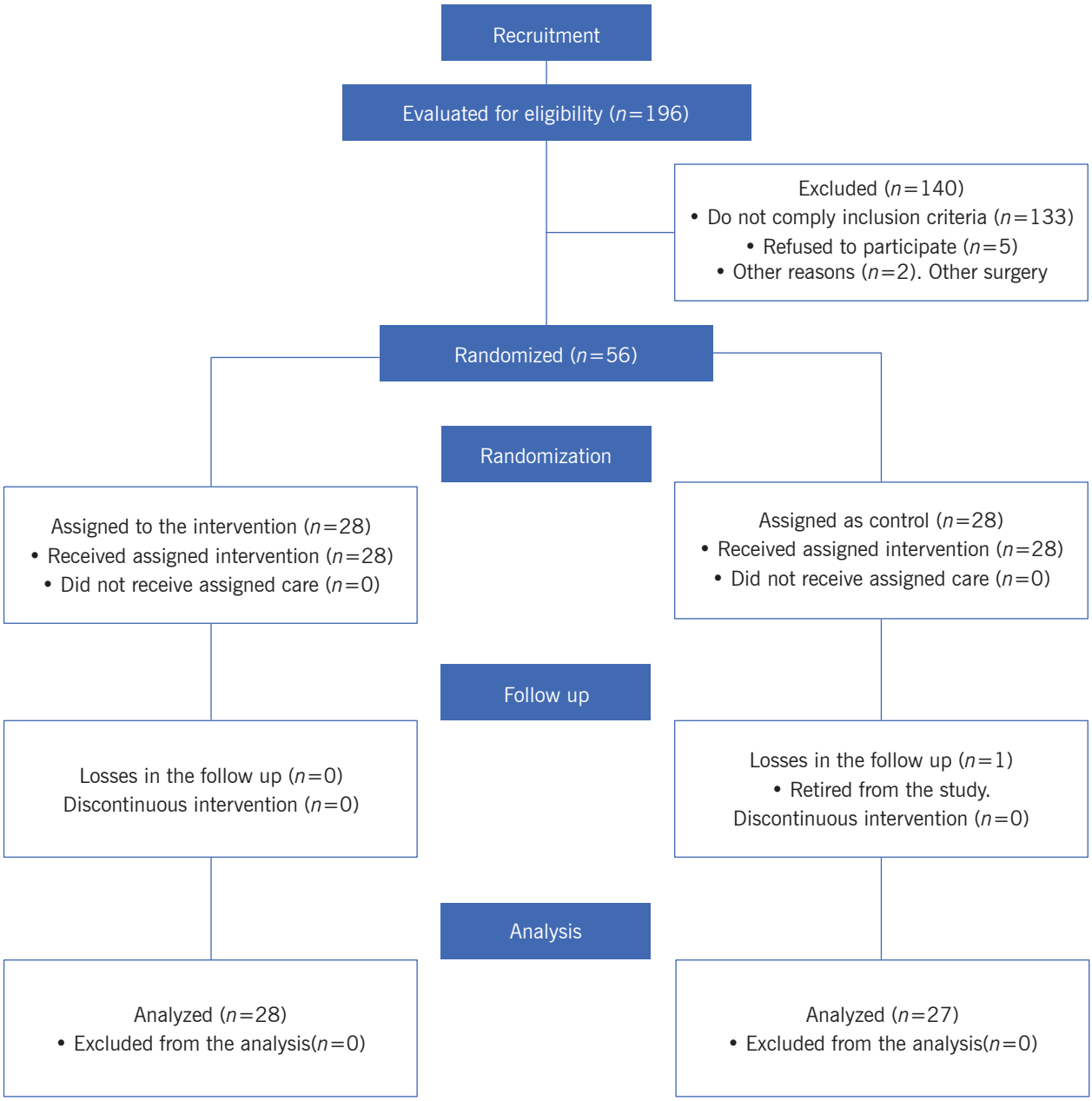

Table 1 shows that no statistically significant differences existed between the study groups in relation to the sociodemographic and clinical characteristics. Generally, it can be said that the participants almost have a ratio of one man per woman, ranging in age between 73 and 76 years and most had family support. Regarding the clinical variables, the antecedent of prior surgeries prevailed among the patients, as well as non-consumption of anxiolytics, risk upon anesthesia was classified from 2 to 4 in the ASA scale; general anesthesia was used during the procedure. For the participants, the major cause of preoperative anxiety is the effects of the anesthetic.

Table 2 shows that, although both groups diminished the anxiety score over time, in the intervention group the difference between both assessment moments is of 4.2 points, while in the control group it is of 1.73 points. The mean score of preoperative anxiety in the post-intervention evaluation was 5 points lower in the intervention group, compared with the control group, with this difference being statistically significant.

Table 1. General characteristics of the study groups

Variable	Control group (n = 27)	Intervention group (n = 28)	p-value
Sex; *n* (%)			0.483
Man	15 (55.5)	14 (50.0)	
Woman	12 (44.4)	14 (50.0)	
Age; mean ±SD	73.7±16.6	76.32±16.1	0.366
ASA Classification; *n* (%)			0.082
0-1	9 (33.3)	6 (21.4)	
2-4	18 (66.6)	22 (78.6)	
Type of anesthesia; *n* (%)			0.536
General	27 (100)	28 (100)	
Other	0 (0)	0 (0)	
Prior surgeries; *n* (%)			0.064
No	12 (44.4)	7 (25)	
Yes	15 (55.5)	21 (75)	
Anxiolytics; *n* (%)			0.599
No	26 (96.3)	28 (100)	
Yes	1 (3.7)	0 (0)	
Social support; *n* (%)			0.537
Family	21 (77.8)	23 (82.1)	
Others	6 (22.2)	5 (17.9)	
Cause of the anxiety; *n* (%)			0.397
Anesthetic	18 (66.7)	17 (60.7)	
Procedure	4 (14.8)	8 (28.6)	
Complications	5 (18.5)	3 (10.7)	

Table 2. Comparison of the total average score of preoperative anxiety in the study groups before and after the procedure

Group	Measurement	Moment	
		Before	After
Intervention (n=28)	Mean ±SD	19.76±8.56	15.56±8.85
	IC95% of the mean	16.37-23.14	12.12-18.99
Control (n=27)	Mean ±SD	22.02±9.35	20.30±8.19
	95%CI of the mean	18.39-25.64	17.06-23.54
	Difference of means between groups	2. 26	5.04
	Bilateral p-value	0.226	0.013

Analysis of repeated measures. In this study, 28 patients from the intervention group and 27 patients from the control group completed both APAIS assessments. In the repeated measures ANOVA, Mauchly's W was 1.0, assuming sphericity and the F test was used (F=14.43, p<0.001) that indicated linear relation between the APAIS score and the study group. The size of the effect was 0.214. In addition, the multivariate model showed a global difference of 3.1±0.36 points (95%CI: 2.36-3.84) between both study groups.

Discussion

This study on the effect of a nursing intervention based on the motivational interview to diminish preoperative anxiety in patients programmed for knee replacement surgery revealed that after six weeks of follow up, the preoperative anxiety score was lower in the group receiving the intervention compared with the control group. The results are consistent with those obtained by Rojas et *al.,*[17] which implemented a nursing educational strategy to diminish anxiety in patients during the pre-operative and post-operative; although anxiety was measured with the Beck test.

In spite of progress in nursing interventions, anxiety remains a problem in patients. However, nursing has revealed that visits during the preoperative stage reduce anxiety and post-surgery complications in patients programmed for laparoscopy surgery.[18] Likewise, Amini *et al.*,[19] through a randomized clinical trial, compared the effect of using brochures plus verbal advice for education about preoperative anxiety and used Spielberger's Trait/State Anxiety Inventory before and after the intervention. They found significant difference between the mean scores of the state anxiety scale between the intervention groups (brochure and verbal) with the control group, additionally recommending the use of well-designed brochures. Another randomized clinical trial in patients programmed for herniated disc surgery used the multimedia strategy to educate about anxiety during nursing visits, finding statistically significant difference between both groups in terms of preoperative anxiety, besides improving vital signs.[20]

Due to the aforementioned, studies recognize the importance of the communication skills nurses must have to approach and care for patients upon a surgical event, which can take place through assessment and follow up by implementing the motivational interview, considered an effective way of improving attitudes and behaviors in individuals by using persuasion and trust.[21] However, another study[22] states that the conventional informative intervention used by nurses and the rest of the health staff does not diminish anxiety in patients. Jiménez *et al*.,[23] found that patients with osteoarthritis of knees feel commonly anxious and that after surgery the level of anxiety drops, but that this change is also related with the degree of satisfaction with the procedure. Another aspect also related with reduced anxiety is that of maintaining empathic and collaborative communication with patients, through informative and persuasive intervention.[24] Due to this, this study adds to existing evidence that interventions based on motivational techniques have resulted effective in other groups, permitting acceptance of the surgery and subsequent changes in lifestyle to comply with recommendations and, finally, improving adherence to the treatment.[25]

To conclude, the nursing intervention based on the motivational interview was effective in diminishing preoperative anxiety in patients programmed for knee replacement surgery. Follow up of patients programmed for orthopedic surgery is of vital importance for nurses to recognize situations and circumstances that cause them anxiety, with the purpose of conducting clinical and informative advice and enhancing care during all the stages of the surgical process. Studies are recommended to investigate the effect of nursing interventions in surgical patients and other related areas. The limitation of the investigation was the availability of a single researcher and, therefore, selection bias cannot be ruled out by the sampling.

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Original article

Profile of the nursing diagnoses in stable heart disease patients

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Profile of the nursing diagnoses in stable heart disease patients

Abstract

Objective. To identify the nursing diagnoses through reports in the medical records of patients monitored in a specialized ischemic heart disease outpatient clinic. **Methods.** Cross-sectional study with retrospective data collection in the medical records. From the data collected, the nursing diagnoses were proposed by the researchers and submitted for validation by specialist cardiology nurses. **Results.** A total of 13 nursing diagnoses were evaluated from the medical records of 50 outpatients with the following validation agreements among the specialists: Ineffective health management (100%), Noncompliance (100%), Sedentary lifestyle (100%), Activity intolerance (100%), Decreased cardiac output (88%), Risk of decreased cardiac tissue perfusion (65%), Risk of intolerance to activity (65%), Acute pain (76%), Ineffective health maintenance (65%), Risk-prone health behavior (65%), Risk for decreased cardiac output

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(65%), Risk for intolerance to activity (65%), Ineffective respiratory pattern (53%), Impaired memory (29%). **Conclusion.** In this study, the nursing diagnoses validated for stable heart disease patients were linked to adherence to treatment and to the cardiovascular responses of the patients, reinforcing the importance of early intervention. These results allow the multidisciplinary team to individualize the goals and interventions proposed for ischemic heart disease patients.

Descriptors: ambulatory care; cross-sectional studies; nursing diagnosis; outpatients; nursing process; myocardial ischemia.

Perfil de los diagnósticos de enfermería en pacientes cardiópatas estables

Resumen

Objetivo. Identificar los diagnósticos de enfermería a partir de los registros en el seguimiento de los pacientes que acuden a un centro ambulatorio especializado en cardiopatía isquémica en la ciudad de Porto Alegre, Brasil. **Métodos.** Estudio transversal con toma de información retrospectiva de la historia clínica. A partir de los datos recolectados, los diagnósticos de enfermería identificados por los investigadores se sometieron a valoración de enfermeros especialistas en cardiología. **Resultados.** Se identificaron 13 diagnósticos de enfermería en las historias clínicas de 50 pacientes ambulatorios, con la siguiente concordancia de validación entre los especialistas: control ineficaz de la salud (100%), falta de adherencia (100%), estilo de vida sedentario (100%), Intolerancia a la actividad (100%), Débito cardíaco disminuido (88%), Riego de perfusión tisular cardíaca disminuida (76%), Dolor agudo (76%), Mantenimiento ineficaz de la salud (65%), Comportamiento de salud propenso a riesgo (65%), Riesgo de débito cardíaco disminuido (65%), Riesgo de intolerancia a la actividad (65%), Patrón respiratorio ineficaz (53%), Memoria perjudicada (29%). **Conclusión.** En este estudio los diagnósticos de enfermería validados para los pacientes cardiópatas estables están relacionados con la adherencia al tratamiento y a la respuesta cardiovascular a las intervenciones, reforzando la importancia de intervención precoz. Esos resultados permiten, en

equipos multiprofesionales, individualizar las metas e intervenciones para los pacientes con cardiopatía isquémica.

Descriptores: atención ambulatoria; diagnóstico de enfermería; estudios transversales; pacientes ambulatorios; proceso de enfermería; isquemia miocárdica.

Perfil dos diagnósticos de enfermagem em pacientes cardiopatas estáveis

Resumo

Objetivo. Identificar os diagnósticos de enfermagem através dos registros no seguimento dos pacientes que vão a um centro ambulatório especializado em cardiopatia isquêmica na cidade de Porto Alegre, Brasil. **Métodos.** Estudo transversal com toma de informação retrospectiva da história clínica. A partir dos dados recolhido, os diagnósticos de enfermagem identificados pelos investigadores foram submetidos a valoração de enfermeiros especialistas em cardiologia. **Resultados.** Foram identificados 13 diagnósticos de enfermagem nas histórias clínicas de 50 pacientes ambulatórios, com a seguinte concordância de validação entre os especialistas: controle ineficaz da saúde (100%), falta de aderência (100%), estilo de vida sedentário (100%), Intolerância à atividade (100%), Débito cardíaco diminuído (88%), irrigação de perfusão tissular cardíaca diminuída (76%), Dor agudo (76%), Manutenção ineficaz da saúde (65%), Comportamento de saúde propenso a risco (65%), Risco de débito cardíaco diminuído (65%), Risco de intolerância à atividade (65%), Padrão respiratório ineficaz (53%), Memória prejudicada (29%). **Conclusão.** Neste estudo os diagnósticos de enfermagem validados para os pacientes cardiopatas estáveis estão relacionados com a aderência ao tratamento e à resposta cardiovascular às intervenções dos pacientes, reforçando a importância de intervenção precoce. Esses resultados permitem em equipes multiprofissionais individualizar as metas e intervenções para os pacientes com cardiopatia isquêmica.

Descritores: assistência ambulatorial; diagnóstico de enfermagem; estudos transversais; pacientes ambulatoriais; processo de enfermagem; isquemia miocárdica.

Introduction

Despite cultural changes, increased life expectancy and increasing technological advances, the incidence of cardiovascular diseases is still significant in the current society, accounting for more than 17.9 million deaths worldwide in 2016.[1] In Brazil, mortality due to cardiovascular diseases represented 28% of all deaths in the previous five years.[2] The classic study 'The global study of risk factors for acute myocardial infarction' (INTER-HEART) evaluated cardiovascular risk factors in 52 countries. It was found that nine risk factors, which are simple to detect and susceptible to change, account for more than 90% of the attributable risk of cardiovascular diseases. Of these, six potentiate the risk of clinical events (dyslipidemia, hypertension, diabetes mellitus, overweight/obesity, smoking, and psychological stress) and three collaborate to reduce this risk (regular exercise, adequate consumption of vegetables and fruits, and small to moderate doses of alcohol).[3]

The study 'Brazilian Intervention to Increase Evidence Usage in Acute Coronary Syndromes' (BRIDGE-ACS), a multi-centric training program initiative to increase the use of evidence-based therapies, quantified an improvement in the quality of the therapy provided by the implementation of very simple educational measures, which can be implemented at low cost.[4] The analysis of chronic heart disease patients, as in a recently published randomized clinical trial, demonstrates this situation in the clinical practice by proving that systematic guidance approaches combined with telephone reinforcement are more effective than standard clinical monitoring consultations.[5] The multiplicity of factors that influence the health conditions of individuals with coronary artery disease justifies the importance of an extended and effective care practice to fulfill the needs of these patients.[6] The application and systematization of care through the Nursing Process steps has been shown to be a scientific method that favors the clinical judgment of the nurse. The use of the nursing process together with a standardized language system, such as that of NANDA International, Inc (NANDA-I) allows nurses to determine the most accurate nursing diagnoses for an individual, community or family. Its use contributes to patient safety by reducing dubious and undue information and allowing appropriate interventions to be selected.[7]

The nursing diagnosis is part of the nursing process and results from the clinical judgment of information obtained from the nursing consultation.[7] The nursing diagnosis is indispensable for the nursing process, since it is the basis for planning interventions and for the nursing outcomes.[8] Accordingly, nurses can act based on evidence, identifying human responses and establishing strategies for health recovery and/or the improvement of the individual or collective well-being.[9] Establishing nursing diagnoses provides innumerable benefits, such as accurately and quickly understanding the patient's needs, facilitating the continuity of care using standardized language, guiding the

choice of nursing interventions that allow better results, determining care priorities, qualifying care, and promoting the development of the profession.[10,11] From this perspective, this study aimed to identify nursing diagnoses from signs and symptoms (defining characteristics), clues or clinical evidence in patients in outpatient monitoring with stable Ischemic Heart Disease, according to NANDA-I. This study is relevant for the practice as it equips the nursing team for an accurate clinical evaluation, with the planning of the expected results and interventions proposed in order to maximize teamwork.

Methods

This was a cross-sectional study with retrospective data collection in the electronic medical records, conducted in an ischemic heart disease outpatient clinic of a University Hospital in the city of Porto Alegre, Brazil. In this outpatient clinic, 50 patients were being monitored. At the first outpatient visit, the following evaluations are performed: anthropometric data collection, clinical examination, and identification of risk factors, the social and family context and the patients' life habits. From these data, the team plans goals for modifications of the lifestyle of the patient, and gives guidance regarding adherence to the treatment. For monitoring in this outpatient clinic, patients must present two or more of the following inclusion criteria: Blood Pressure > 140x90 mmHg with the use of antihypertensives; Body Mass Index > 25 kg/m^2; glycated hemoglobin > 6.5%; sedentary lifestyle; currently smoking; Low-density lipoprotein > 150 mg/dl with the use of statins; and triglycerides > 150 mg/dl. For this study all 50 patients referred to the team had their records evaluated.

Data collection was performed by two researchers in January and February 2016, through the reading of the electronic medical records, evaluating the record of the first consultation performed by the outpatient clinic staff. The interval of interest was defined from the inauguration of the outpatient clinic (April 2014) to the month immediately prior to the collection of the information (December 2015). Patients whose medical records did not present a record of evolution in the outpatient clinic of ischemic heart disease during the period of interest were excluded from the study.

The information was transcribed to a structured form with two sections: patient identification, which included data such as name, age, sex, color and comorbidities; and anamnesis and physical examination data. From these data, in addition to clinical experience and support from the literature, thirteen probable NANDA-I nursing diagnoses were pre-selected based on the defining characteristics, risk factors, related factors, clues, signs and/or possible symptoms. The selected diagnoses were transcribed to a form according to NANDA-I taxonomy[6] and submitted for evaluation and validation by 17 specialist nurses - all with specialization or Master's degrees in cardiology and over five years of experience in the clinical practice. For this step a document was drawn up listing the diagnoses identified for the study patients, as well as the defining characteristics, related factors or risk factors, with the respective prevalences. The document was printed and delivered personally to the specialists, to carry out the analysis of the content and the judgment of agreement or not with the validation of the proposed nursing diagnoses. The participants had 15 days to complete this instrument and return it to the researchers. After completion of the document and signing of the consent form, the document was delivered directly to the researchers at an agreed time and place. Only the nursing diagnoses that were selected by 100% of the specialists were considered valid. The choice of this percentage was based on similar studies that considered a consensus of 100% among the specialists in order to confer greater consistency, solidity and applicability on the inferred diagnoses.[12]

The data were analyzed using the Statistical Package for the Social Sciences, version 21.0

program. Continuous variables were expressed as mean and standard deviation, median and interquartile range. Categorical variables were presented with absolute numbers and percentages. This study was approved by the research ethics committee of the institution.

Results

The 50 patients being monitored by the team at the outpatient clinic were included, with no exclusions due to inadequate registration. Of the 50 patient medical records, 64% were from males, mean age 64 (± 7.7) years, white (82%), married (66%), working (62%), with incomplete elementary education (54%) and living with family members (64%). Regarding the clinical characteristics, the patients presented systemic hypertension (96%), diabetes mellitus (48%), acute coronary syndrome (66%), coronary artery bypass grafting (22%) and heart failure (16%). The other data referring to the characteristics of the group of participants are described in Table 1.

During the review of the medical records, the predominant defining characteristics were: difficulty with the prescribed regimen 49 (98%), choices in the daily life ineffective to achieve health goals 49 (98%), failure to act in order to prevent problems (88%), lack of adherence behavior 44 (88%), failure to act to reduce risk factors 43 (86%), and failure to include the treatment regimen in the daily life 42 (84%). The related factors most identified in the records were: insufficient knowledge of the therapeutic regimen 49 (98%), complex treatment regimen 46 (92%), inadequate number of indications of action 43 (86%), prolonged duration of the regimen 43 (86%), failure to achieve results 42 (84%), and low self-efficacy 42 (84%). From this investigation, 13 NDs were proposed for validation by the specialist nurses, with the respective NANDA-I taxonomy coding and the percentage of agreement among the specialists, as presented in Table 2.

At the end of the validation process by the specialists, four NDs were indicated with 100% agreement, according to table 3: Sedentary lifestyle (00168), Ineffective health management (00078), Noncompliance (00079) and Activity intolerance 00092). The first three are located in the Health Promotion domain, while the final one is in the Activity/Rest domain. The respective classes to which these NDs belong, within each domain, are class 1 (Health Awareness); class 2 (Health Management); class 2 (Health Management); and class 4 (Cardiovascular-pulmonary responses).

Table 1. Sociodemographic and clinical characteristics of 50 stable heat disease patients (cont)

Variable	*n*=50
Sociodemographic characteristic	
Age; Mean ± standard deviation	64±7.7
Male; *n* (%)	32 (64)
White color; *n* (%)	41 (82)
Marital status: married; *n* (%)	33 (66)
Occupation: working; *n* (%)	31 (62)
Schooling: incomplete fundamental education; *n* (%)	27 (54)
Lives with family members; *n* (%)	32 (64)

Table 1. Sociodemographic and clinical characteristics of 50 stable heat disease patients (cont)

Variable	*n*=50
Clinical Characteristics	
Sedentary lifestyle; n (%)	31 (62)
Smoking; *n* (%)	14 (28)
Body mass index; Mean ± standard deviation	30±5.0
Systemic hypertension; *n* (%)	48 (96)
Type II Diabetes Mellitus; *n* (%)	24 (48)
Percutaneous Transluminal Coronary Angioplasty;*n* (%)	38 (76)
Acute Coronary Syndrome; *n* (%)	33 (66)
Coronary Artery Bypass Grafting; *n* (%)	11 (22)
Cardiac Insufficiency; *n* (%)	8 (16)
Glycated hemoglobin; Mean ± standard deviation	9.3±3.0
Triglycerides mg/dl; Median and interquartile range	208 (120-355)
High density lipoprotein mg/dl; Mean ± standard deviation	36.1±9.2
Low density lipoprotein mg/dl; Median and interquartile range	97 (68.5-162)
Total cholesterol mg/dl; Mean ± standard deviation	187±59.0

Table 2. Nursing diagnoses evaluated by the 17 specialists and their respective agreement

Nursing diagnosis	*n* (%)
Ineffective health management (00078)	17 (100)
Noncompliance (00079)	17 (100)
Sedentary lifestyle (00168)	17 (100)
Activity intolerance (00092)	17 (100)
Decreased cardiac output (00029)	15 (88)
Risk for decreased cardiac tissue perfusion (00200)	13 (76)
Acute pain (00132)	13 (76)
Ineffective health maintenance (00099)	11 (65)
Risk-prone health behavior (00188)	11 (65)
Risk for decreased cardiac output (00240)	11 (65)
Risk for activity intolerance (00094)	11 (65)
Ineffective respiratory pattern (00032)	9 (53)
Impaired memory (00131)	5 (29)

Table 3. Nursing diagnoses validated by the 17 specialists in 50 stable cardiac patients

Nursing diagnosis	Patients *n* (%)
Sedentary Lifestyle (00168)	
Defining characteristics	
Daily physical activity less than recommended for gender and age	17 (34)
Lack of physical fitness	15 (30)
Related factors	
Insufficient interest in physical activity	10 (20)
Insufficient motivation for physical activity	14 (28)
Insufficient training	1 (2)
Ineffective health management (00078)	
Defining characteristics	
Difficulty with prescribed regimen	46 (92)
Ineffective daily choices to achieve health goals	43 (86)
Failure to act to reduce risk factors	44 (88)
Failure to include the regimen of treatment into daily life	43 (86)
Related factors	
Family conflict	1 (2)
Insufficient knowledge of the therapeutic regimen	10 (20)
Inadequate number of indications of action	43 (86)
Complex treatment regime	46 (92)
Noncompliance (00079)	
Defining characteristics	
Noncompliance behavior	44 (88)
Exacerbation of symptoms	22 (44)
Failure to achieve results	42 (84)
Related factors	
Prolonged duration of the regime	43 (86)
Complex treatment regime	43 (86)
Activity intolerance (00092)	
Defining characteristics	
Discomfort in efforts	25 (50)
Dyspnea on exertion	12 (24)
Fatigue	5 (10)
Related factors	
Imbalance between oxygen supply and demand	24 (48)
Sedentary lifestyle	02 (04)
Insufficient knowledge of the regime	17 (34)

Discussion

This is the first study that proposed to study the records of an outpatient team specialized in Ischemic Heart Disease, aiming to establish the potential nursing diagnoses for this population. The analysis of the records allowed specialist nurses in the area of cardiology to validate four nursing diagnoses for outpatients with ischemic heart disease: Ineffective health management (00078); Noncompliance (00079); Sedentary lifestyle (00168) and Activity intolerance (00092). When analyzing the domains and classes of the groupings established by the NANDA-I, it was verified that three of the four validated nursing diagnoses are related to life habits. Considering the breadth and complexity of the lifestyle problem, especially in the context of patients with ischemic heart disease, understanding the determinant factors favors an expanded view of the causes and consequences of an unhealthy lifestyle.[13] Together with adherence to lifestyle changes, regular use of medications is also a challenge for health staff. About 50% of patients with ischemic heart disease have poor adherence to treatment, and consequently, no clinical benefit is obtained from the use of medications.[14] Failure to comply with the established therapeutic goals is related to a greater number of hospitalizations, higher costs of the disease and worse quality of life, since the complications are installed earlier and more intensely.[15] Accordingly, team approaches can favor the understanding of the patients, improve the bond with family members and caregivers, and provide greater adherence to treatment.

Considering the Noncompliance (00079) and Ineffective health management (00078) nursing diagnoses, both contained in the Health Management class of the Health Promotion domain, the importance of addressing this complex issue is reinforced, as is the difficulty in modifying behavior. Adherence, according to the 1997 report of the American Heart Association, has been understood as a behavioral process, heavily influenced by the environment in which the patient lives, including health practices and systems - an assumption that the patient possesses the knowledge, motivation, skills and resources necessary to follow the recommendations of the healthcare provider.[16] Currently, adherence is understood as a more comprehensive concept, influenced by several factors related to the patient, the complexity of the treatment, the health services, and the provider-user relationship. In this way, it is understood that the patient is not the only one responsible for their treatment.[17,18] In this scenario, patient satisfaction was referenced as being fundamental for adherence. Satisfaction levels are related to several components of the consultation, namely affective aspects (emotional support and comprehension), behavioral aspects (adequate prescriptions and explanations) and aspects related to the competence of the health professional (appropriate diagnosis, treatment and referral), as well as the content of the consultations provided, in which the patients should receive as much information as possible, conveyed in the best way.[19]

It is recognized that the need for greater changes in habits or lifestyle due to the treatment (cessation of smoking and alcohol intake, dietary restrictions and the performance of physical activity) reduces the chances of more adherence.[19] The difficulty of incorporating routine physical exercises, indicated by the Sedentary lifestyle (00168) diagnosis, should take into account the repercussion of this practice on the health status of the individual. Evaluating the possible and probable impacts on patients' daily lives implies broadening the care routine to design goals to be agreed with the patient based on the knowledge of their attitudes, beliefs and health habits - since they explain the reason for sedentary behaviors rather than the practice of physical exercise.[10] In this specific group of patients, the related factors that help confirm this nursing diagnosis are Insufficient interest in physical activity and Insufficient motivation for physical activity, which, if their percentages are added, were present in almost half of the sample [24 (48%)]. On the other hand, the Activity intolerance (00092) nursing diagnosis presented, among the defining characteristics and risk

factors that interfere in the practice of physical activity, dyspnea on exertion [12 (24%)], fatigue [5 (10%)] imbalance between oxygen supply and demand [24 (48%)], stress discomfort [25 (50%)] and the presence of angina [37 (74%)]. These factors are recognized as restrictive for the performance of physical practices, especially activities with aerobic increase. In addition, stress discomfort seems to be one of the main limitations to physical exercise, not only due to the indication of angina, but also due to the association that many chronic patients (especially our population, in which more than half, 66%, presented acute coronary syndrome) make between this pain and a condition of a major adverse clinical event - emphasizing a potential psychological restriction for the full practice of physical activities.

Despite decades of study and various models and theories of adherence it has not yet been possible to come up with an effective answer to resolve this issue. Risk factors for coronary artery disease, as well as other diseases, coupled with the need for a complex therapeutic regimen, make it difficult for patients to fully adhere, especially considering changes that should become more of a healthy lifestyle rather than a habit.

The limitations of the present study are due to its retrospective nature and the search in medical records.

The results of this study allowed four diagnoses to be validated for patients with stable heart disease, including Ineffective health management (00078); Noncompliance (00079); Sedentary lifestyle (00168); and Activity Intolerance (00092). These diagnoses are linked to adherence to the treatment and to the cardiovascular responses of the patients, reinforcing the importance of early intervention. This information allows the context of the patient to be identified and, therefore, the care and evaluation to be planned, with a view to the rehabilitation and prevention of the progression of the disease. In this context, the establishment of nursing diagnoses is considered the guiding factor for choosing the most appropriate interventions to achieve the results expected for each individual.

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Original article

Care during Breastfeeding: Perceptions of Mothers and Health Professionals

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Caring during Breastfeeding: Perceptions of Mothers and Health Professionals

Abstract

Purpose. To know the perceptions of mothers and health professionals in relation to the care provided and received during breastfeeding at primary health care level. **Methods.** A qualitative exploratory study was conducted with breastfeeding mothers (10) and primary health care professionals (24). Data was gathered through in-depth interviews and focus groups. Data analysis was performed through thematic content analysis. The rigor of the study was ensured by the Guba and Lincoln criteria for qualitative research. Ethical aspects were addressed through the informed consent process, confidentiality, and methodological rigor. **Results.** The experience of providing/receiving breastfeeding support was revealed as a dynamic, multidimensional care and support process, through three central themes: 1. Influence of previous care and support experiences during the breastfeeding process; 2. Importance of the context within which care is framed;

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and 3. Addressing emotions to establish trust between professionals and mothers. **Conclusion.** The study findings contribute to further understanding a complex phenomenon, such as breastfeeding support and care for mothers/families, from the experience of the actors involved, deepening the experiences of both in integrated manner. In addition, the relational, organizational, and contextual dimensions that influence support, and that should guide care, are also highlighted.

Descriptors: breastfeeding; mothers; primary care nursing; qualitative research.

Cuidados durante el amamantamiento: percepciones de madres y profesionales de salud

Resumen

Objetivo. Conocer las percepciones de madres y profesionales de salud en relación con los cuidados que se brindan y que reciben durante el proceso de amamantamiento en el nivel primario de atención. **Métodos.** Estudio cualitativo exploratorio realizado en Santiago (Chile) con la participación de 10 madres en proceso de lactancia y 24 profesionales de la salud. La recolección de datos se realizó a partir de entrevistas en profundidad y grupos focales. El análisis de la información se obtuvo mediante el análisis de contenido temático. El rigor de la investigación se guardó con los criterios de Guba y Lincoln. Los aspectos éticos se abordaron mediante el proceso de consentimiento informado, confidencialidad y rigor metodológico. **Resultados.** La experiencia de brindar y recibir apoyo durante el proceso de amamantamiento se develó como un proceso de cuidado y apoyo dinámico, multidimensional, a partir de tres temas centrales: Influencia de las experiencias previas de cuidado y apoyo durante el proceso de amamantamiento; Importancia del contexto en el que se enmarca el cuidado; y Abordaje de las emociones para el establecimiento de la confianza entre profesionales y madres. **Conclusión.** Las percepciones de madres y profesionales de salud en relación a los cuidados que se brindan y que reciben durante el proceso de amamantamiento son un fenómeno con dimensiones

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contextuales, organizacionales y relacionales que influyen en el apoyo, por lo que deberían orientar el cuidado.

Descriptores: lactancia materna; madres; enfermería de atención primaria; investigación cualitativa.

Cuidados durante a amamentação: percepções de mães e profissionais de saúde

Resumo

Objetivo. Conhecer as percepções de mães e profissionais de saúde em relação aos cuidados que se brindam e recebem durante o processo de amamentação no nível primário de atenção. **Métodos.** Estudo qualitativo exploratório realizado em Santiago (Chile) com a participação de 10 mães em processo de amamentação e 24 profissionais da saúde. O recolhimento de dados se realizou através de entrevistas em profundidade e grupos focais. A análise da informação se obteve através da análise de conteúdo temático. O rigor da investigação se cautelou por meio dos critérios de Guba e Lincoln. Os aspectos éticos se abordaram mediante o processo de consentimento informado, confidencialidade e rigor metodológico. **Resultados.** A experiência de brindar e receber apoio durante o processo de amamentação se revelou como um processo de cuidado e apoio dinâmico, multidimensional, através de três temas centrais: Influência das experiências prévias de cuidado e apoio durante o processo de amamentação; Importância do contexto no qual se enquadra o cuidado; e Abordagem das emoções para o estabelecimento da confiança entre profissionais e mães. **Conclusão.** As percepções de mães e profissionais de saúde em relação aos cuidados que se brindam e recebem durante o processo de amamentação são um fenômeno com dimensões contextuais, organizacionais e relacionais que influem no apoio e que deveriam orientar o cuidado.

Descriptores: aleitamento materno; mães; enfermagem de atenção primária; pesquisa qualitativa.

Introduction

Breastfeeding is considered the optimal form of infant feeding exclusively up to six months of life and then complemented, up to two years of age or more.[1] In Chile, exclusive breastfeeding at six months of life is at 53%,[2] a figure that has increased due to strategies implemented for its promotion. Although current figures are close to the expected goal (60%), the percentage of children with exclusive breastfeeding at one month of life is the lowest since 1993.[3] Nationally, policies and programs exist focused on favoring the biopsychosocial development of children, which contemplate promotion of breastfeeding.[4] Evidence exists about the sociodemographic characteristics of breastfeeding women; rates of initiation of breastfeeding, its duration, main causes for weaning, and the most-frequent problems, among others.[5,6] Likewise, some aspects of the social environment, like the support received by the mothers from the health staff,[7] and the self-efficacy of women in relation to breastfeeding.[8] Thus, it is known that factors influencing upon the breastfeeding process are known partially, which hinders its establishment and maintenance, and the design of strategies by the health staff.[9]

With respect to how health professionals experience the process of providing support to mothers who breastfeed, an inconsistency exists, characterized by contradictory accounts in relation to breastfeeding, which creates confusion in the mothers. The aforementioned is related with the support to breastfeeding being a dynamic, multidimensional process with diverse relational, contextual, and situational components.[10] The purpose of this research was to know the perceptions of mothers and health professionals in relation to the care provided and received during the breastfeeding process in the primary care level.

Methods

A qualitative exploratory study was conducted in two Family Health Centers of primary care level in the Metropolitan Region of Santiago, Chile. Through a purposeful sampling, 45 health professionals and 20 mothers were invited to participate in the study of which 24 professionals (20 who provided care to mothers in the breastfeeding process and four who worked in management positions), and 10 breastfeeding women accepted participation in the study. The inclusion criteria of the professionals were: provide direct care to the mother/child during the gestation, puerperium, and infant health supervision; and professionals in management positions related with breastfeeding decision making. The inclusion criteria for the mothers were: 18 years and older, breastfeeding her child under 1 year of age, primiparous and multiparous. Maternal contraindication to breastfeeding and pre-term

children or with pathologies that interfere with establishing the breastfeeding practice were considered exclusion criteria.

The principal researcher invited, through e-mail, professionals who provided care to participate in a focus group, and the managers to an in-depth interview. The mothers were invited to an in-depth interview by a nurse from each Health Center. Prior to the activities to collect information, the research team explained to the participants the objectives and ethical considerations of the study and, thereafter, the participants signed the informed consent.

The number of participants was determined through data saturation, which was reached with two focus groups of direct care professionals, four in-depth interviews with the managers, and 10 in-depth interviews with the mothers, for a total of 34 participants. The interviews and focus groups were conducted during October 2017 and January 2018 by the principal researcher and a co-researcher, who kept a record through a field diary of their own feelings and experiences on the study theme. To collect the sociodemographic characteristics of the mothers and the professionals, questionnaires were used created specifically for such. Interviews with the mothers were conducted in the Health Centers, in a place specifically assigned for said purpose, with an average duration of 30 minutes, starting with the question: What has been your experience with breastfeeding your child from the beginning until now?

For the professionals who provided direct care, a focus group was conducted in each Health Center, which had a script of questions established and lasted 60 minutes each. Finally, in-depth interviews were carried out with the management professionals, starting with the question: What does the organization currently do to support mothers and their families during the breastfeeding process? The interviews and the focus groups were audio-recorded, transcribed textually, and anonymized for subsequent coded storage in the principal researcher's computer.

The Scientific Ethics Committee of the Faculty of Medicine at Pontificia Universidad Católica de Chile and the Ethics Committee of the South East Metropolitan Health Service of Santiago de Chile approved the study. A thematic content analysis was performed, using Dedoose software, generating a detailed and systematic record of the themes and common aspects of the reports by the mothers and the professionals, grouping such into higher-order categories and subcategories.[11] Compliance of the criteria of methodological rigor was ensured for qualitative research proposed by Guba and Lincoln.[12]

To present the results, the following abreviations were used to identify the source of information; when interviewing the mothers, the abreviation MI was used followed by the number of the interview (for example: MI7 is the seventh interview carried out with mothers). For interviews conducted with the professionals in management positions, the abbreviation MPI was used. Likewise, for the focus groups with the professionals, the abreviation used was FG, followed by abreviations accounting for the type of professional cited: Midwife (M), Nurse (N), and Family Physician (FP). Thus, for example, FGM means that said citation was obtained during the focus group and corresponds to the Midwife professional.

Results

The principal characteristics of the 24 health professionals and the 10 mothers participating in the study can be observed in Table 1.

Table 1. Principal characteristics of the study participants (Cont.)

Characteristic	Value
Health staff (n=24)	
Gender	
Female	21/24
Male	3/24
Age range in years	25 to 43
Profession	
Physician	12/24
Nurse	8/24
Midwife	4/24
Level of formation	
Undergraduate	9/24
Graduate	15/24
Professional experience in years	1-19
Personal experience of motherhood/fatherhood-	
Yes	11/24
No	13/24
Personal experience or of their partner with breastfeeding	11/24
Perception with experience of breastfeeding	
Very good/good	9/11
Poor	2/11
Mothers (n=10)	
Age range in years	21-32
Education > 10 years	8/10
Presence of the partner	10/10
Prior experience with breastfeeding	
Yes	6/10
Duration in months	8-36

Characteristic	Value
It was a good experience	6/6
Reasons for weaning	
Return to work	3/6
Spontaneous by the child	2/6
Difficulty sleeping	1/6
Type of delivery	
Vaginal	5/10
Cesarean	5/10
Early skin-to-skin contact	5/10
Begin breastfeeding first hour of life	2/10
Mother and child rooming-in	8/10
Supplementation with formula during puerperium due to difficulty in latching	7/10
Exclusive breastfeeding upon discharge	8/10
Child's type of feeding at the moment of the interview	
Less than 6 months with exclusive breastfeeding	4/6
Less than 6 months without exclusive breastfeeding	2/6
Over 6 months with breastfeeding + solid feeding	3/4
Over 6 months with mixed breastfeeding +solid feeding	1/4

The experience of providing and receiving support during the breastfeeding process was revealed as a process of care and dynamic and multidimensional support. This experience was classified into three central themes: *the influence of previous care and support experiences during the breastfeeding process; importance of the context in which care is framed; and addressing emotions to establish trust between professionals and mothers.*

Influence of previous care and support experiences during the breastfeeding process

The actors involved in the process show up with their host of experiences in relation to breastfeeding, from a personal and professional dimension, where their own experiences are conjugated with breastfeeding care and support experiences during this process. Satisfaction or difficulty felt by the mothers with respect to breastfeeding at that very moment is the starting point: *The truth is she accepted the breast immediately, the midwife told me: "it's as if she had always been breastfed", it did not take anything... I felt no difficulty (MI3)*. The mothers express specific support demands, related with a need of being cared for to improve their own care of their children and the breastfeeding process. The needs emerging from the diverse realities the women experience require family support, with a leading role gained by the partner and the mother, who are constituted into their principal figures of support. The experiences of the professionals who determine how support is being provided to mothers/families in the breastfeeding process emerge from the experiences in relation to their own breastfeeding process, and from the experiences around care and previous support offered within the health care context: *My own breastfeeding experience I believe is super important when supporting other mothers because I also had*

some difficulties... to be able to empathize with another (FGFP).

Furthermore, professionals take into consideration their prior care and support experiences with breastfeeding, which nourish their way of confronting new instances of support: *There is an important link here with the patients, generally when they are multiparous we work with the way it went in previous pregnancies, how did it go with the breastfeeding... to prepare us for whatever is coming and to break the myth that if it was bad in previous pregnancies, now it will not be necessary for the same to occur (FGM).*

Importance of the context in which care is framed

Those contextual situations that intervene in the care experience related with the institution and professionals, take place within a scenario of primary level health care. Professionals, as well as mothers/families, have the possibility of interacting in diverse instances of the breastfeeding process, propitiating the interaction and links among them. In turn, professionals highlight tools at care management level, like the existence of programs and policies that promote support for breastfeeding at country level; and orientations that guide the management of the organization of care: *I think that from the organizational point of view and – above all – from the perspective of the infant program, which we are in charge of promoting breastfeeding, is to be constantly training and reminding, enhancing the importance of breastfeeding (MPI1).* Additionally, professionals emphasize elements to support breastmilk, such as the contents and modality addressed, as aspects that are part of their context and which could favor breastfeeding. Themes are highlighted, like the technique and positions of breastfeeding, demystification of beliefs, technique of breastmilk extraction, benefits of breastfeeding, among others: *What we see are the benefits of breastfeeding; we speak ideally of the minimum ages it is recommended... specifically the latching, the positions that can be tried. Ah, and we see extraction of breastmilk, duration times, how to store it (FGN).*

Also, as part of the institutional context, the participants identify the existence of an institutional conviction about the relevance of *breastfeeding* during the development of infant health and the importance of promoting it through programmed support activities: *There is great disposition for teamwork and to promote these support interventions. Everyone has it quite clear that with breastfeeding there is lower risk of acute infections, less risk of obesity (MI2)*. Likewise, mothers also identify the emphasis of breastfeeding by the health staff as a strength: *In reality, I have always seen here a special emphasis on breastfeeding. Support is very good from everyone (MI3).* In relation to the contextual situations of the families that impact upon the support, the professionals indicate that these are related with the psychosocial conditions of the population in which the health centers are inserted. For example, that mothers with informal jobs, without postnatal rest, are obligated to return to labor activities early, or the consumption of drugs by the mother, as situations that impede prolonging the breastfeeding through the time recommended: *Because we have many mothers who are not with their children after two months because they need to return to work... This also happens with drug consumption, within a highly vulnerable social setting that hinders maintaining the breastfeeding activity for the greatest time possible (MPI2).*

Addressing emotions to establish trust between professionals and mothers

Care and support activities during the breastfeeding process are experienced through an interpersonal professional-mother/family encounter, whose key elements are the recognition of the emotions involved and the establishment of trust between the actors. The mothers indicate experiencing initially negative emotions in relation to breastfeeding, such as affliction for not being able to breastfeed, physical discomfort with breastfeeding, frustration for feeling that they are not doing it well, and fear of breastfeeding: *I suffered it a lot because sometimes I felt I could not feed, I got desperate*

and I would start to cry. I was desperate because I would say: "oh heck, I can't breastfeed my child because my nipples are very short, they are small" (MI7). These feelings are more present at the beginning of breastfeeding and disappear as this process progresses and the mother overcomes the difficulties. The mothers also identify feelings of happiness and satisfaction for having achieved to breastfeed, which remains as global feeling of the experience, even when initially the emotions tend to be more negative. The professionals, in turn, perceive that mothers go through a process that is variable and particular, but which in general most of them are willing to breastfeed, given that they know that it is best for their children. Nevertheless, they perceive that the first weeks postpartum constitute a period during which mothers experience anguish and lack of support; and then they become empowered until they manage to enjoy it: *But I believe that for all of them it is difficult, above all with the first or second baby, it is always difficult (FGM).*

From the recognition of the emotions involved, it is possible to establish the encounter and identify the needs of the mothers/families for which it becomes necessary to promote a safe and trusting environment. The mothers are capable of identifying in the professionals those positive and negative characteristics that impact significantly on their perception of support and on how the encounter and the trust between them is generated. As elements that strengthen support, they emphasize the close, respectful, and affectionate treatment they perceived from the professionals; their disposition to clear doubts, consider their opinion and experience, and provide information. These attributes favor actors strengthening mutual trust during the interpersonal encounter: *I think it is also in how you are given the information; here, they are quite close, they are respectful. We were surprised, for example, that when they call a patient, they greet them with a kiss, "hi, how are you?" or they shake hands, very personalized (MI6).* In addition, the mothers were also capable of identifying those characteristics from the professionals who did not provide them support, and who had a negative influence on their experience. They indicate that the members of the health staff who did not support them were characterized by a distant and cold treatment, with little or no disposition to clear their doubts, with lack of time to listen to them, and who pressured them to breastfeed without considering what was happening to them: *Because there are some doctors or midwives who are very grim, very cold and who do their work and bye (MI7).* To the extent to which a relationship was established based on security and trust, the mother perceived that the professional was close and was focused on suppor ting her to satisfy her own needs. The aforementioned seemed to favor increased trust in relation to their capacity to breastfeed. Likewise, to the extent to which the professional perceived being in tune with the mother with respect to the care offered, trust also seemed to increase in relation to their capacity to support the mother/family during the breastfeeding process. On the contrary, when the professional-mother/family relationship was established, on an environment of distrust and insecurity, the mother perceived that the professional was not focused on supporting her to satisfy her needs, causing more anguish and distancing. In turn, the professionals perceived difficulty to begin the relationship and doubted of their capacities to support.

Discussion

The interpersonal relationship between health professionals and mothers/families is the starting point to establish care interactions. Nurses conceive these relationships as the means to provide care centered on the unique needs of each person.[13] This is how, through the interpersonal relationship, the complexity of nursing care is expressed, considering the dimensions in its human and social nature, as in this study. An aspect that characterizes the relationship established between the professional and the mother/family in breastfeeding support is that it is strongly influenced by the personal and professional experience of the actors involved, which has also been reported by other authors.

[14] This could be explained because breastfeeding is a social process developed in diverse individual and collective settings and which is much more than the promotion of a health behavior.

The results of this study show that the relationship between the professional and the mother/family during the breastfeeding process is characterized by being an encounter of multidimensional care where the professional supports the mother/family for them – in turn – to care for the child, conceiving this encounter as a constellation of care. Although some studies highlight the importance for the mother to receive support from professionals and their family,[6,15] no publications were found that conceptualize the integration of the different types of support, addressing this constellation of care produced. Previous studies have identified that mothers go through a cascade of negative feelings that evolve toward positive feelings as the mother gains trust in the breastfeeding process.[16] During this process, the mother constitutes her maternal identity and, hence, the support she receives from professionals becomes relevant.[10] This study observed how mothers have felt judged by the health staff when having difficulties in breastfeeding their children; others, on the contrary, felt the support received allowed them to gain trust in their breastfeeding process.

The finding that the personal experience of health professionals with their own breastfeeding influence on the care they provide is of great interest. Within the breastfeeding setting, it has been described that professionals after having lived their own experiences, changed their way of providing care.[17] These findings do not seem exclusive of this type of care; rather, they extend to other health promotion environments.[18] This seems to indicate that addressing the personal experiences of professionals with respect to care in health promotion, and specifically in the setting of breastfeeding, could be essential when proposing improvements in the care they provide. In addition, this study found that professional experience in care for breastfeeding impacts upon the support offered to the mothers. The participants reported having had prior positive care experiences that reinforced positively their attitudes and beliefs regarding the support they provided to the mothers. Similarly, other studies endorse this idea, but in negative sense. When professionals have experienced difficulties in providing care to breastfeeding mothers, they have identified lack of preparation[19] or have even concluded that it is not part of their professional role to offer this type of support.[20] This could be distancing them from providing the care the mothers need.

The mothers and professionals in this study identified conditions arising during the encounter that permitted them to give meaning to the experience of care and support. Among those conditions that permit giving a positive meaning to the experience of the encounter, trust in the professional-mother/family relationship emerges as a relevant aspect. The aforementioned is backed by studies that indicate that establishing trust in the relationships between nurses and patients promotes commitment and improves the disposition of patients to be active members within the care team.[21] Conversely, when a climate of trust is not established, the encounter can be weakened and transformed into a negative experience for both actors. Some of the conditions identified by the participants in this study that contribute to distrust in the interpersonal relationship are lack of respect for the decisions made or for the situation each mother is in, not including the partner, and lack of professional skills aimed to effective communication in the professional-patients relationship.

Other studies have described some essential attributes for trust to exist in the nurse-patients relationship that could be applied in the case of breastfeeding. Among them, we can highlight the ability of professionals to establish relationships through effective communication, which will allow them to identify the unique needs of each person.[21] Thus, this study has observed that to the extent that a relationship was established based on trust, the mother perceived the professional as another close person. Thus, mothers seemed to increase trust in relation to their capacity to

breastfeed. Reciprocally, when professionals perceived being in tune in the relationship with the mother, they also seemed to increase their trust in relation to their capacity to support them during their breastfeeding process. This finding is related directly with the concept of self-efficacy, which corresponds to the perception people have about their own capacities to achieve certain performances.[22] Self-efficacy has been applied to the breastfeeding process and evidence shows that the greater the trust the mother has in her capacity to breastfeed, greater will be the possibility for successful breastfeeding. It may be due to this that interventions that include this concept to the support mothers during the breastfeeding process have proven effective in improving rates of exclusive breastfeeding.[23] Further, in relation to the self-efficacy perceived by the professionals, this seems to increase as they acquire more experience in support and also when they themselves have experienced the process of breastfeeding a child.[24] Both aspects are of interest for the proposal of opportunities in training professionals to improve exposure to significant learning experiences that permit them to increase their self-efficacy without having to depend on their personal experiences with breastfeeding.

This study also identified the importance of the context in which the professional-patient encounter takes place. Existence of activities to support multilevel breastfeeding backed and framed within specific policies increases the impact on exclusive breastfeeding rates and on its duration.[25] Although in recent decades many efforts have been invested to better understand the effectiveness of different support interventions for breastfeeding;[5,25] few studies have focused on understanding relational, organizational, and contextual aspects that could impact upon this practice and, thereby, on the care required to support it.[26]

The results herein contribute to understanding how the context could influence positively or negatively on the results of interventions implemented to support breastfeeding. In this study, some of the participating mothers belonged to groups with social vulnerability and/or from diverse origins, which supposes an added challenge for health professionals. To individualize care from a sociocultural perspective, professionals need to establish a facilitating relationship, show respect for the beliefs and values of the women and their family, and support making informed decisions by them. [27]

In conclusion, knowledge of the perceptions of mothers and health professionals in relation to care provided and received during the breastfeeding process was revealed as a critical dimension that must be considered to provide care centered on the needs of those who receive it and those who provide it. The results reported by this study contribute to delve into understanding a complex phenomenon, like support and care of mothers/families during the breastfeeding process, from the experiences of the actors involved, with an integral perspective, given that these delve into the experiences of both in interrelated manner. Furthermore, the study reveals the contextual, organizational, and relational dimensions that influence upon the support and which should guide care.

The study presented limitations worth mentioning. One was that it did not consider participation from the closest relatives, who turned out to be the principal sources of support for the mothers. The work included participating mothers who belonged to a lower-middle and middle class, who were users of the public health system (majority of the Chilean population). However, there is a percentage of the population of which little is known, which has acces to health care in the private sector and for the same reason, does not have direct access to public policies in support of breastfeeding. Given the aforementioned, we suggest continuing with additional research that includes significant participants for the mothers and who belong to both health systems (public and private), to delve into the experience of care in relation to breastfeeding and learn from their own perspective how this phenomenon is experienced in a broader manner.

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Review

Effectiveness of nursing educational interventions in managing post-surgical pain. Systematic review

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Effectiveness of nursing educational interventions in managing post-surgical pain. Systematic review

Abstract

Objective. Analyze and integrate studies that inquire on the benefits of nursing educational interventions to manage post-surgical pain. **Methods.** A systematic search was conducted in the databases of Scopus, Medline (Pubmed), Web of Science, The Cochrane Library, and CINAHL of systematic reviews, randomized clinical trials, and quasi-experimental studies published in English and Spanish until 2018 that analyzed the effectiveness of educational interventions in managing post-surgical pain in adult patients. **Results.** Twelve studies complied inclusion criteria, of which nine reported less pain in the group receiving the educational intervention. These interventions also helped to diminish the level of anxiety and improved functionality to perform activities of daily life. The level of quality of the studies was medium. **Conclusion.** Although the review showed that nursing educational interventions could influence on the relief of post-surgical pain, more rigorous studies are necessary, with bigger sample sizes

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and higher methodological quality, which help to establish the real effectiveness in managing post-surgical patients with pain.

Descriptors: effectiveness; nursing research; pain, postoperative; pain management; patient education as topic; review.

Efectividad de las intervenciones educativas enfermeras en el manejo del dolor postquirúrgico. Revisión sistemática

Resumen

Objetivo. Analizar e integrar los estudios que indagan en los beneficios de las intervenciones educativas enfermeras para el manejo del dolor postquirúrgico. **Métodos.** Se realizó una búsqueda sistemática en las bases de datos Scopus, Medline (Pubmed), Web of Science, The Cochrane Library y CINAHL de revisiones sistemáticas, ensayos clínicos aleatorizados y estudios cuasiexperimentales publicados en inglés y castellano hasta 2018 que analizaran la efectividad de las intervenciones educativas en el manejo del dolor postquirúrgico en pacientes adultos. **Resultados.** Doce estudios cumplieron criterios de inclusión, de los cuales nueve reportaron menor dolor en el grupo que recibió la intervención educativa. Estas intervenciones también ayudaron a disminuir el nivel de ansiedad y mejoraron la funcionalidad para realizar las actividades de la vida diaria. El nivel de calidad de los estudios fue medio. **Conclusión.** Aunque la revisión mostró que las intervenciones educativas enfermeras podrían influir en el alivio del dolor postquirúrgico, son necesarios estudios más rigurosos, con mayores tamaños muestrales y de mayor calidad metodológica que ayuden a establecer la real efectividad en el manejo del paciente postquirúrgico con dolor.

Descriptores: efectividad; investigación en enfermería; dolor posoperatorio; manejo del dolor; educación del paciente; educación del paciente como asunto; revisión.

Efetividade das intervenções educativas de enfermagem no manejo da dor pós-cirúrgico. Revisão sistemática

Resumo

Objetivo. Analisar e integrar os estudos que indagarão nos benefícios das intervenções educativas de enfermagem para o manejo da dor pós-cirúrgico. **Métodos.** Se realizou uma busca sistemática nas bases de dados Scopus, Medline (Pubmed), Web of Science, The Cochrane Library e CINAHL de revisões sistemáticas, ensaios clínicos aleatorizados e estudos quase-experimentais publicados em inglês e castelhano até 2018 que analisassem a efetividade das intervenções educativas no manejo da dor pós-cirúrgico em pacientes adultos. **Resultados.** Doze estudos cumpriram critérios de inclusão, dos quais nove reportaram menos dor no grupo que recebeu a intervenção educativa. Estas intervenções também ajudaram a diminuir o nível de ansiedade e melhoraram a funcionalidade para realizar as atividades da vida diária. O nível de qualidade dos estudos foi médio. **Conclusão.** Embora a revisão mostrou que as intervenções educativas de enfermagem poderiam influir no alivio da dor pós-cirúrgico, são necessários estudos mais rigorosos, com maiores tamanhos de amostras e de maior qualidade metodológica, que ajudem a estabelecer a real efetividade no manejo do paciente pós-cirúrgico com dor.

Descritores: efetividade; pesquisa em enfermagem; dor pós-operatória; manejo da dor; educação de pacientes como assunto; revisão.

Introduction

Pain is a serious public health problem of global relevance. The International Association for the Study of Pain defines pain as an unpleasant emotional and sensory experience associated to current or potential tissue damage. By being a subjective experience, its measurement varies according to the person's perception.[1] Besides, according to its nature, pain can be acute, produced by tissue damage, of sudden onset and which ceases with the passage of time; or chronic, when it occurs during a long period of time, causing a limiting problem in daily life and which is aggravated by factors, like age, gender, and environmental and psychological factors, among others.[1] In the recent decades, knowledge has increased on the physiopathology of pain. However, evidence shows that its treatment continues being poor and insufficient. In this sense, postoperative pain is still a challenge in the management of post-surgical patients, having important physiological, psychological, economic and social consequences.[2] Prior studies show that over 80% of patients subjected to a surgical process experience pain. Of this percentage, 75% of patients experience moderate, severe, or extreme pain.[3,4] Other studies indicate that nearly half the patients have severe pain due to inadequate healing.[5,6]

It is known that in the perception of pain, multiple factors influence, such as the type of intervention, age, gender, or the patient's own expectations, which hinders foreseeing the level of pain patients can experience after surgery.[7] Prior research show that efficient post-surgical control contributes to facilitating the patient's physical and psychological recovery, diminishes the hospital stay, and improves quality of life and levels of stress. Also, reducing social and health costs.[8] Furthermore, nursing professionals are trained to educate patients in the control and management of pain. We know that one of the obstacles to manage effectively post-surgical pain is the patient's lack of knowledge or misunderstandings. Thereby, educational interventions can impact upon patients by modifying their behavioral pattern, knowledge, attitudes, and skills to achieve improved health. Hence, good preoperative information, provided by nursing professionals, can help to prepare patients for the postoperative phase, equipping them with autonomy to become active components of their care and treatment, which will contribute to better managing pain.[1] Most prior studies have focused on relief of post-surgical pain and management of anxiety.

To our knowledge, no prior systematic reviews exist that additionally analyze other variables, like the development of daily activities or the vital constants. The objective of this review is to analyze and integrate studies that inquire on the effects of nursing educational interventions on the relief of post-surgical pain.

Methods

This study conducted a systematic review of randomized clinical trials (RCT), quasi-experimental studies, systematic reviews and meta-analyses that analyzed the effectiveness of educational interventions, conducted during the preoperative and postoperative phases, on the relief and prevention of post-surgical pain. The search included articles published in English and Spanish in the databases of Scopus, Medline (Pubmed), Web of Science, The Cochrane Library, and CINAHL. It included articles to February 2018 to analyze studies reflecting the association between the educational intervention and relief and decrease of post-surgical pain in patients subjected to any type of surgery. Table 1 gathers the search strategy used. In addition, a secondary search was conducted through the references cited by the studies found in our initial search and which were related with the principal objective of the study.

Two reviewers performed independently the search and selection of the articles; thereafter, agreeing on the results. This process used the following criteria. Inclusion criteria: 1) Systematic reviews, RCT, quasi-experimental studies, and meta-analyses inquiring on the effectiveness of educational interventions in managing post-surgical pain; 2) Studies published to February 2018 in English or Spanish; and 3) Studies including in their sample a population over 18 years of age. Exclusion criteria: 1) Studies showing very low quality after the evaluation with instruments for their analysis (score < 40% of the instrument's maximum score); 2) Educational interventions aimed at the relatives; and 3) Studies including in their sample patients with mental pathology. The study followed the principles of the PRISMA Declaration.[9]

To analyze the quality of articles potentially eligible, the following instruments were used: Checklist for Systematic Reviews and Research Syntheses from the Joanna Briggs Institute and AMSTAR to evaluate the systematic reviews, the JADAD scale to evaluate the RCT, Joanna Briggs Institute Checklist for Quasi-experimental Studies to evaluate quasi-experimental studies and the Newcastle-Ottawa Scale (NOS) to evaluate the quality of the meta-analyses. The AMSTAR scale has 16 items with four possible responses.[10] The Checklist for Systematic Reviews and Research Syntheses is an instrument to evaluate the quality of systematic reviews and has 11 items with 11 being the maximum score.[11] The NOS has eight items, with a star granted in each item referring to the categories of selection and exposition, and a maximum of two in the comparison.[11] The JADAD scale has five items, with a score from 0 to 5, considering those aspects related with the study bias, like randomization or masking.[12] The quasi-experimental studies were evaluated with the Joanna Briggs Institute Checklist for Quasi-experimental Studies, which has nine items, with 9 being the maximum score.[13]

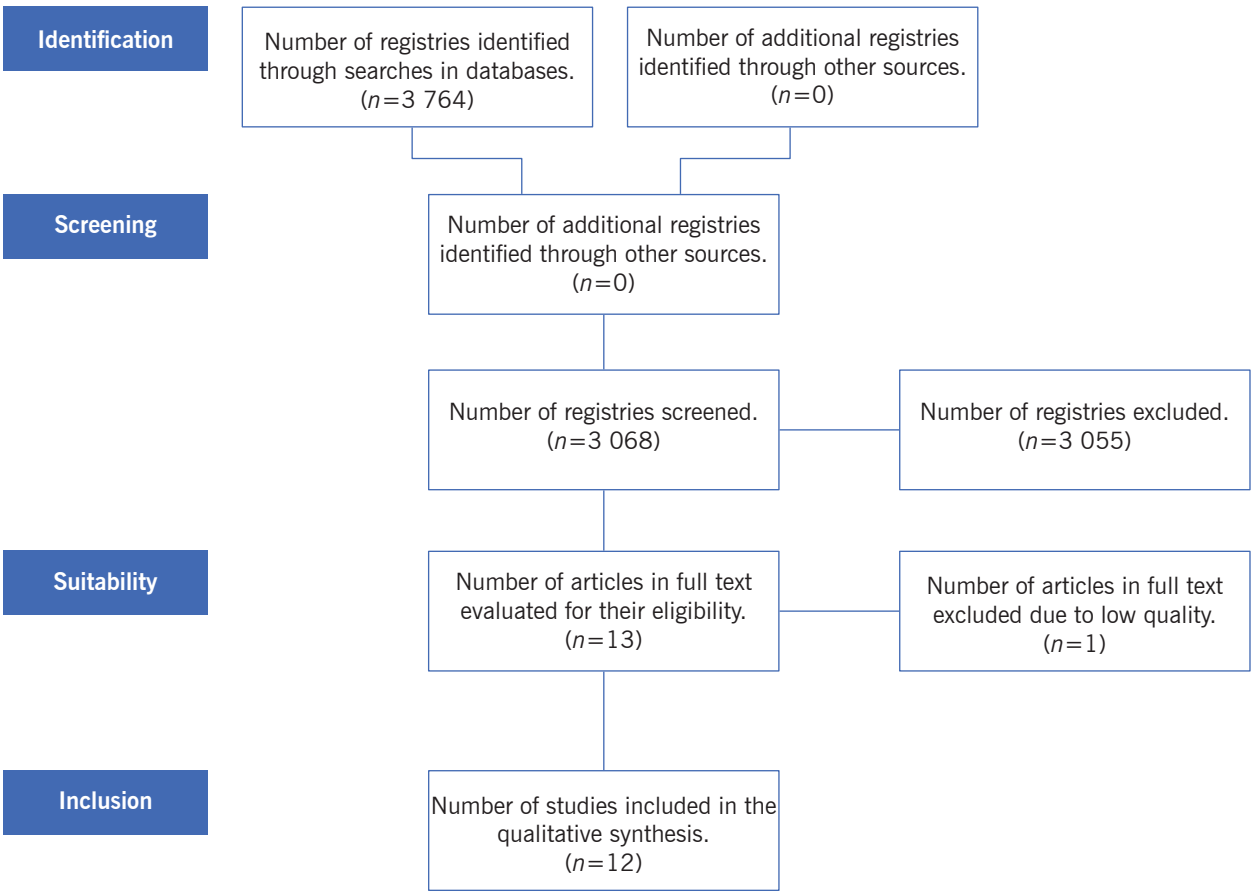
Table 1. Search strategy used in the databases analyzed

Database	Search strategy
Web of Science MedLine (PubMed) The Cochrane Library CINAHL Scopus	(pain OR acute pain) AND ("post surgical" OR postoperative OR surgery) AND ("pain management" OR "Pain control" OR "Pain relief" OR "pain education" OR "patient education") AND (educati* OR intervention) AND (nurs*)

Results

The initial search in the databases selected found 3 068 articles after eliminating articles duplicated in various databases. After a first review of the titles and abstracts 3055 articles were eliminated because of dealing with themes different from the object of study. Thereafter, 13 articles were reviewed in full text, from which one article was excluded because it had an insufficient score after its quality analysis (Figure 1). Finally, 12 articles were included in this review. Table 2 summarizes the principal characteristics of the studies analyzed.

Figure 1. Flow diagram of the search and selection process



In relation with the type of study, six of the articles analyzed were controlled randomized trials (CRT),[14-19] a systematic review and meta-analysis[20] and five quasi-experimental studies.[21-25] Regarding the geographical area, the studies were conducted in seven countries: South Korea,[14] China,[15,17,21,25] Canada,[16] Finland,[18] Norway,[19] Spain,[22] the United States,[23] and Holland.[24] The studies included analyzed the effectiveness of different educational interventions aimed at the management and relief of post-surgical pain. In this sense, some of the studies analyzed the effectiveness of educational interventions online,[1,3] others on educational interventions aimed at managing pain and anxiety;[2,4,5,7] certain studies inquired on the relationship between knowledge on the consumption of opioids and the pain management,[6,8,10,11] while others analyzed the effectiveness of an educational intervention in ambulatory surgery[22] or the relationship between pain and post-surgical rehabilitation.[12]

Furthermore, certain heterogeneity was found regarding the types of interventions used in the studies, finding the following interventions: educational interventions based on the delivery of graphic material,[15,17,19,22,25] use of audiovisual material and new technologies[14,16,24,25] as support to the educational intervention and interventions based on informative talks.[18,21,23] In all cases, the educational intervention was directed by the patients, except in one of the studies[14] in which the intervention was aimed at both patients and nursing professionals.

The principal result measurements analyzed in the studies were pain, anxiety, or level of knowledge about the patient's pain. As secondary results, consumption of analgesics, functional rehabilitation, quality of life, vital constants, or functional disability associated with pain were analyzed.[15,16,22,24,25] In relation with the scales and instruments used by the studies to measure the results, the studies included used the Numerical Graduation Scale,[14,16,19,23-25] the Visual Analog Scale (VAS),[15,18,21,22] the Brief Pain Inventory-Short Form (BPI-SF) scale[17] and the State-Trait Anxiety Inventory (STAI).[15,18,20,21]

Table 2. Principal characteristics of the articles analyzed

Reference	Summary of the study (cont.)
14	*Authors; year:* Hong and Lee; 2014. *Country:* South Korea. *Type of study:* Randomized Clinical Trial (RCT). *Objective:* To analyze the relationship between an intervention that uses an evidence-based online educational guide and improved levels of pain in patients intervened from an abdominal surgery. To know the nursing staff's level of knowledge about pain. *Intervention:* A control group (CG) was established of patients, which did not receive information about the surgery, and two experimental groups (EG1 and EG2) that did receive said information. After the surgery, tests were conducted to evaluate the level of pain and of knowledge about it by the patients. For the nursing professionals, a pre-post test was conducted after the educational intervention to assess the level of knowledge. *Characteristics of the sample and follow up:* 112 patients over 19 years of age, intervened for a surgery lasting over one hour, with degree 1 or 2 in the body classification of the American Association of Anesthesiology, conscious patients, capable of communicating and oriented, with stable vital signs before the operation. Pain was measured at one hour, 6, 12, 18 and 24 hours. From the first day after surgery to the 14th day, pain was measured in the EG1, and from the 15th day to the 18th day, it was measured in the EG2. The sample of professionals was comprised by 27 nursing professionals who had worked at least one year in a pre-operative anesthesia unit. Knowledge of the nurses was measured on the day of the intervention, at 14 days and 28 days later. *Result measurements:* Numerical Graduation Scale of pain. *Results:* After the educational intervention aimed at the nursing staff, the score between the pre- and post-test increased. Patients in the EG showed lower scores of post-operative pain with respect to the CG. *Conclusions:* Educational interventions using evidence-based online guides improve the level of post-operative pain in patients and increase the level of knowledge of the nursing staff. In spite of the aforementioned, the presence of contradictory evidence and the lack of access to scientific evidence are factors that hinder the elaboration of these guides. Implementation of these guides in the clinical practice can be useful to reduce postoperative pain; further research is necessary investigations to contribute with more information to this theme. *Quality score:* 2/5 in the JADAD scale.
15	*Authors; year:* Lee et al.; 2017. *Country:* China. *Type of study:* RCT. *Objective:* To determine the effects of an educational intervention about pain and anxiety in patients intervened for spinal surgery. *Intervention:* The control group (CG), which included 43 patients, received a verbal 10-minute educational intervention on the day before the surgery. The experimental group (EG), which had 43 patients, received a pamphlet with information about the characteristics of pain, the surgical procedures and its care, additionally, it received a 40-minute educational intervention. Characteristics of the sample and follow up: 66 patients over 20 years of age who knew Chinese Mandarin or Taiwanese and without hearing or visual difficulties. The variables to study were measured one day before the surgery, half an hour before the surgery, and the day after such. *Result measurements:* Visual Analog Scale (VAS) to evaluate pain. State-Trait Anxiety Inventory (STAI) scale to evaluate anxiety.

Reference	Summary of the study (cont.)
15	*Results:* After an intervention based on the combination of delivering a pamphlet with information about the characteristics of pain, the surgical procedures and its care, and a 40-minute educational intervention, the patients had lower levels of pain and anxiety than the patients in the control group. No significant changes were found in the vital constants before and after the intervention. *Conclusions:* Educational interventions help significantly in lowering anxiety and post-operative pain. However, these seem to have no repercussion on variables, like blood pressure, cardiac frequency, and respiratory frequency. The use of these types of interventions in the clinical practice can be useful to manage patient anxiety. *Quality score:* 3/5 in the JADAD scale.
16	*Authors; year:* Martorella et al.; 2012. *Country:* Canada. *Type of study:* RCT. *Objective:* To analyze the effectiveness of an educational intervention via online on the relief of post-surgical pain in patients intervened for heart surgery. *Intervention:* The CG had 30 participants who received habitual education before the surgery. The EG had 30 participants who received the habitual intervention before the surgery plus online intervention, where the definition of pain was detailed, how could affect each patient, and advice on its treatment. Characteristics of the sample and follow up: 60 patients over 18 years of age intervened for the first time for heart surgery, capable of understanding and communicating in French. The educational intervention of both groups was conducted days prior to the surgery, and the subsequent results were measured through questionnaires on the day of hospital admission, one day after the surgery and on the seventh day after the surgery. *Result measurements:* Numerical Graduation Scale of pain. *Results:* After the educational intervention online, no significant differences were found between the groups in the level of pain perceived after the surgery. However, the experimental group receiving additional information online had less interferences in their daily life. Besides, significant differences were found in the difficulties of patients during deep breaths, when coughing or in appetite. Also, participants from the EG showed a change in behavior about taking analgesics. During the measurements, the experimental group showed less pain, but it was not statistically significant. *Conclusions:* An educational intervention online can influence positively on the pain management and can provoke a positive change in behavior upon such, diminishing barriers in its management and the influence of pain in daily life activities. These types of interventions can be useful in the clinical practice to conduct health education in the post-operative setting. Further research is needed for in-depth exploration of its effects. *Quality score:* 2/5 in the JADAD scale.
17	*Authors; year:* Guo et al.; 2012. *Country:* China. *Type of study:* RCT. *Objective:* To determine the effects of an educational intervention on reducing anxiety, depression, or pain and improving patient recovery. *Intervention:* The CG had 77 patients who received the habitual educational intervention, which consisted in verbally informing one day before the surgery of the surgical process, risks, analgesia, and pain management. The EG had 76 patients who received a broader session two or three days before the intervention, complemented with a specific pamphlet explain the pre-operative preparation, the stay in the Intensive Care Unit, and the recovery at home.

Reference	Summary of the study (cont.)
17	*Characteristics of the sample and follow up:* 153 patients over 18 years of age who would be subjected to heart surgery, able to communicate in and understand Chinese Mandarin. After the surgical intervention, a follow up was conducted of the patients during the first seven days after the surgery. *Result measurements:* To measure the pain perceived and its influence on daily life, the Brief Pain Inventory-Short Form (BPI-SF) scale was used. *Results:* After an educational intervention complementing the habitual information with additional specific information, a significant decrease of anxiety was reported in the experimental group with respect to the control group. In relation to pain, no significant differences were found among patients from both groups. However, the control group had lower levels of pain and less problems to fall asleep. *Conclusions:* Specific educational interventions for cardiac patients who will be subjected to surgery help patients psychologically, diminishing their anxiety and depression. However, these interventions do not affect significantly the relief and management of post-surgical pain. These types of interventions are easy to design and carry out. In the clinical practice, these interventions can help to reduce the pre- and post-operative anxiety of patients. *Quality score:* 3/5 in the JADAD scale.
18	*Authors; year:* Kesänen et al.; 2017. *Country:* Finland. *Type of study:* RCT. *Objective:* To analyze the effectiveness of an educational intervention on anxiety, quality of life, disability, and pain in patients intervened for spinal stenosis. *Intervention:* The CG had 50 patients who received the habitual education consisting of information on the type of intervention, complications, different treatments, etc. The EG had 50 patients who received more detailed education via telephone where patients were also encouraged to become an active part in their treatment, aside from the habitual intervention. *Characteristics of the sample and follow up:* 100 patients 18 years old or over, with capacity to communicate and understand the local language (Finnish), with capacity to use a mobile phone and who would be subjected to spinal surgery. Before the surgery, knowledge of both groups was evaluated. The variables to study were registered upon admission, after the operation, and after three and six months of the operation. *Result measurements:* VAS to evaluate pain and Spielberger's State Trait Anxiety Inventory (STAI Form Y-1) to evaluate anxiety. *Results:* After an educational intervention, based on empowering patients, its inclusion in the treatment and on the dissemination of the habitual information via telephone, a significant increase was found of patient knowledge on the characteristics of postoperative pain. Although a significant drop of anxiety was reported in the experimental group after the surgery, no significant differences were found in both groups. There was a decrease in pain relief in both groups, without significant differences between both. Pain relief was greater in the first three months after the intervention. *Conclusions:* An educational intervention based on empowering patients and on the dissemination of the habitual information via telephone, by itself does not significantly affect relief of post-surgical pain, quality of life, or disability in patients subjected to spinal surgery. In spite of the aforementioned, this type of intervention is effective to diminish anxiety. *Quality score:* 4/5 in the JADAD scale.

Reference	Summary of the study (cont.)
19	*Authors; year:* Bjørnnes et al.; 2016. *Country:* Norway. *Type of study:* RCT. *Objective:* To determine the characteristics of pain, consumption of analgesics, and the impact of an educational intervention on managing post-surgical pain in patients subjected to heart surgery. *Intervention:* The CG had 175 patients, who received a 10-minute talk that solved possible doubts about the surgical process and pain relief. The EG had 174 patients who received in complementary manner a brochure that indicated the importance of relieving post-surgical pain, how and when to seek help after the surgery, pharmacological and non-pharmacological methods, and common problems after the surgery. *Characteristics of the sample and follow up:* 349 patients over 18 years of age, able to read and write in the local language and who were programmed for specific cardiac surgery. After delivering the pertinent information to each group, the variables to study were measured 24 hours before the surgery, and follow up of the sample was conducted on day 10 after the surgery, as well as 1, 3, 6, and 12 months after such. Result measurements: Numerical Graduation Scale of pain. Brief Pain Inventory-Short Form (BPI-SF). *Results:* After an educational intervention complementing the habitual talks with a brochure, no significant differences were found between the control and experimental groups regarding moderate-severe pain ($p=0.6$) during the follow up, or in the interferences in daily life ($p=0.3$) in the first two weeks. *Conclusions:* The results of this study do not confirm the effectiveness of an educational intervention based on an informative brochure to relief post-surgical pain. Pain control continues being a problem in patients subjected to surgery, which why it is necessary for future studies to develop and assess educational strategies that aid in the relief of post-surgical pain. *Quality score:* 3/5 in the JADAD scale.
20	*Authors; year:* Ramesh et al.; 2017. *Country:* Canada, China, Iran, Greece, the United Kingdom, Norway, Thailand, and Australia. *Type of study:* Systematic review and meta-analysis. *Objective:* To analyze the benefits obtained after an educational intervention in patients subjected to heart surgery. *Intervention:* Multiple educational interventions aimed at patients subjected to heart surgery. Characteristics of the sample and follow up: 2 071 patients over 18 years of age subjected to any type of heart surgery. *Result measurements:* Levels of anxiety measured with the Zung Self-Rating Anxiety Scale and the State-Trait Anxiety Inventory. Level of pain evaluated with the Brief Pain Inventory-Short Form (BPI-SF) and with the Visual Analog Scale. Days of hospital stay were measured. *Results:* Of the variables studied, only in anxiety was a significant difference found between the control group and the experimental group that received the educational intervention. The other variables (pain, depression and hospital stay) revealed no statistically conclusive change. Evidence of the studies included was low due to the lack of clarity in the partiality and imprecision of the effects studied. Results obtained were not backed by studies of quality. *Conclusions:* Educational interventions improve significantly levels of anxiety of patients; however, these cannot exert significant changes in variables, like pain, depression, or days of hospital stay. In the clinical practice, educational interventions can be useful to treat anxiety and promote patient relaxation. More studies are needed and with higher methodological quality that test the effects of educational interventions in managing post-surgical pain. *Quality score:* JBI scale for Systematic Reviews 8/11.

Reference	Summary of the study (cont.)
21	*Authors; year:* Wong Eliza Mi-Ling et al.; 2010. *Country:* China. *Type of study:* Quasi-experimental study. *Objective:* To analyze the effects of an educational intervention about pain, anxiety, and independence in patients intervened for musculoskeletal trauma. *Intervention:* The CG had 62 patients who received habitual care. The EG had 63 patients who received habitual care plus an educational intervention, which consisted of a 30-minute talk with information about pain and relaxation and breathing strategies. *Characteristics of the sample and follow up:* 125 adult patients who knew Cantonese, who were ambulatory before the surgery and diagnosed with musculoskeletal trauma. *Result measurements:* Pain was evaluated with the VAS scale. Anxiety was evaluated with the STAI and independence with the Chinese version of the Self-efficacy Scale. *Results:* After the educational intervention, no significant differences were found in pain over time that could determine that the educational intervention caused a difference in managing post-surgical pain. However, during the hospitalization period, a statistically significant difference was found on the level of pain between the CG and the EG, especially on days 2, 4, and 7, which suggested a possible effect of the educational intervention. The results were possibly influenced by other factors, like social support, economic status, family environment, etc. *Conclusions:* The results of this study suggest that an educational intervention during hospitalization can be effective for pain management, although it is possible that the results may be due to the use of analgesics. After an educational intervention, a trend is shown for pain relief in patients intervened for musculoskeletal trauma, although not significant. It is feasible that nurses implement educational interventions for relief of post-surgical pain, and it is likely that these interventions are well-accepted by the patients. *Quality score:* JBI scale for Quasi-experimental Studies 7/9.
22	*Authors; year:* Font Calafell et al.; 2011. *Country:* Spain. *Type of study:* Quasi-experimental study. *Objective:* To evaluate the efficacy of an educational intervention, conducted by nursing, based on the delivery of graphic material, to relieve post-surgical pain in patients intervened for hernia in a major surgery ambulatory unit. *Intervention:* The CG received habitual education, consisting in a pre-operative nursing consultation, where verbal information was provided on the characteristics of the intervention; a clinical interview; and education about self-care. The EG additionally received a tryptic with detailed information about the preparation of the surgery and recommendations for managing post-operative pain. *Characteristics of the sample and follow up:* 497 patients over 16 years of age, without difficulties for communication or cognitive impairment. The CG patients were intervened from July 2006 to June 2007. The EG patients were intervened between July 2007 and June 2008. Data were collected upon admission to the Ambulatory Surgery Unit, where the degree of understanding of the information received was measured and ended with a phone call 24 hours post-operative to assess the degree of pain. *Result measurements:* VAS. *Results:* The CG patients who received the usual education plus a tryptic with detailed information about the preparation of the surgery and recommendations for managing postoperative pain manifested pain in 73.2% of the cases, against 78.1% in the experimental group ($p = 0.2$), with this being an insignificant difference. However, the difference of patients with a VAS > 3 between the control and experimental groups was statistically significant. *Conclusions:* An educational intervention conducted by nurses, based on the delivery of graphic material to manage postoperative pain in ambulatory hernia surgery, achieves lower pain in the first 24 hours post-operative, having less problems in mobilization, and greater adherence to treatment with analgesics. Gender or age of patients can influence on the perceptions of pain. In the clinical practice, these types of interventions could be useful to improve therapeutic adherence. *Quality score:* JBI scale for Quasi-experimental Studies 8/9.

Reference	Summary of the study (cont.)
23	Authors, year: Reynolds; 2009. Country: The United States. Type of study: Quasi-experimental study. Objective: To analyze the effectiveness of an educational intervention on the degree, knowledge, attitude, management, and satisfaction of pain in the daily lives of patients after one week of discharge after a surgery. Intervention: The CG had 59 patients who received habitual information. The EG had 87 patients who received the habitual information implemented with a brochure that added information that covered topics about the beliefs about pain, how to recognize the barriers related with its treatment, how to seek information, and the importance of staying in contact and conducting the follow up with the health service. Characteristics of the sample and follow up: 146 patients over 18 years of age from two rural hospitals, who could communicate in English, without cognitive impairment and capable of filling out the study questionnaire. The variables to evaluate were measured before the randomization of the groups and patients were followed up one week later. Result measurements: Numerical Graduation Scale of pain. Brief Pain Inventory. Results: The results of this study show that, during the pre-test, just before the educational intervention, both the CG and the EG had the same thoughts about pain and its management and both indicated they would experience from 7 to 10 points of pain after the surgery. After the surgery, there were significant differences in the sensation of pain between both groups, However, there were pain scores above 6 points in 7% of the patients (12% in the CG, 5% in the EG). In all, 81% of the patients manifested that the nurse clarified the importance of the treatment and were satisfied with pain management by the nursing staff. Conclusions: An educational intervention based on delivering a brochure with information about topics on pain, the way of solving barriers for its treatment or the importance of follow up with health services for its management can be effective to reduce postoperative pain perceived by patients. This study shows the usefulness of providing adequate information and including the patients within the treatment as active subjects. Hence, future studies should delve into these aspects. Quality score: JBI scale for Quasi-experimental Studies 7/9.
24	Authors; year: Van Dijk et al.; 2015. Country: Holland. Type of study: Quasi-experimental study. Objective: To analyze the effect of a pre-operative educational intervention on the demand for opioids by patients, and know the repercussion of the intervention on post-operative pain, fears, and knowledge about opioids. Intervention: The CG had 183 patients who watched a 3-minute film that explained how the hospital's information and entertainment system operated. The EG had 194 patients who were shown a 6-minute film where the actors explained through interpretation the Numerical Graduation Scale, the importance of managing post-operative pain, and the to move and cough to prevent complications. Characteristics of the sample and follow up: 357 adult patients capable of communicating and understanding German. The variables to study were gathered after watching the film, measuring beliefs about pain, as well as the demographic variables. The level of pain was again measured 24 hours after the surgery. Result measurements: Numerical Graduation Scale of pain and Verbal Rating Scale (VRS) to assess pain. Anxiety was measured through the Questionnaire on Fear of Surgery from Holland. Results: No significant differences were noted on the perception of pain in both groups after the intervention, although the patients in the experimental group reflected greater knowledge and lesser difficulty when facing post-operative pain. Lower levels of pain were shown in the EG due probably better understanding of it. Additionally, they did not require extra analgesia. Better knowledge of opioids helped to improve the process of patient-professional communication. Conclusions: An educational intervention based on viewing a film about the characteristics of pain and the importance of its treatment is capable of reducing pain in patients subjected to surgery, additionally, helping to increase their knowledge about analgesia and reducing barriers in the treatment. In the clinical practice, this intervention could aid in patients expressing more precisely their pain, being useful to professionals to make better decisions. Quality score: JBI scale for Quasi-experimental Studies 6/9.

Reference	Summary of the study (cont.)
25	*Authors; year:* Chen *et al*.; 2014. *Country:* China. *Type of study:* Quasi-experimental study. *Objective:* To evaluate the effectiveness of an educational intervention on post-surgical pain, rehabilitation, and functional recovery of patients intervened for knee replacement. *Intervention:* The CG had 50 patients. The EG had 42 patients who received an informative intervention based on the delivery of a pamphlet and a CD with detailed information and examples of pre- and post-operative care, rehabilitation exercises, and mobilization methods. *Characteristics of the sample and follow up:* 92 patients 18 years of age or older, intervened for the first time for knee replacement that could move about and get out of bed before the operation, and free from post-operative complications. The variables were measured the day before the intervention and daily the first five days after surgery. *Result measurements:* Numerical Graduation Scale of pain for pain. Besides, functionality was evaluated with the Chinese adaptation of a functional state subscale of the Multidimensional Functional Evaluation Questionnaire. *Results:* In general, pain perceived by the experimental group, which received an educational intervention based on the delivery of an informative pamphlet plus an explicative CD, was significantly lesser. The differences in the measurements of perceived pain were statistically significant in the first three days after surgery. In addition, good results were found in the performance of the rehabilitation and acquisition of strength. However, no differences were found between groups in functional recovery. *Conclusions:* A pre-operative educational intervention supported by the use of an educational brochure and a CD can reduce the level of postoperative pain experienced by patients with total knee replacement, as well as increase the regularity of rehabilitation exercises and muscular strength of the affected leg. In the clinical practice, this type of intervention could increase the regularity of performing rehabilitation exercises, making the rehabilitation more effective. *Quality score:* JBI scale for Quasi-experimental Studies 8/9.

Regarding the principal results reported in these studies after these interventions, while certain studies found a significant reduction of post-surgical pain after the educational intervention,[14,15,25] other did not report statistically significant reduction of pain after the intervention.[16,17,20,22-24] In these last studies, although no significant differences were reached, the levels of pain in the experimental group were lower. Additionally, all those studies that analyzed anxiety found statistically significant differences in the levels of anxiety between the groups after the educational intervention.[15,17,20,21]

Studies inquiring on the interference of pain in the activities of daily life found that, after the educational intervention, pain interfered less in the experimental group, which is why these patients had less problems to mobilize, walk, or perform actions, like coughing.[16,18,21-23,25] Other results reported in the studies were that the educational intervention increased the participants' knowledge about analgesics, as well as their consumption, improving adherence treatment after the intervention.[22] Besides, greater therapeutic adherence permitted better control of pain and with it less problems in mobility.[22] In another study, the educational intervention helped in the functional improvement and rehabilitation of the member affected,[25] while a study reflected that the educational intervention had no effect on the patient's vital constants (cardiac frequency, blood pressure, and respiratory frequency).[15]

In relation to the methodological quality of the studies analyzed, it was found that the six RCT, evaluated with the JADAD scale,[12] obtained scores of 2 points,[14,16] 3 points[15,17,19], and 4 points from a maximum of 5 points.[18] The study evaluated with the Joanna Briggs Institute Checklist for Systematic Reviews[11] reached a

score of 8 points from a maximum of 11 points;[20] and the five quasi-experimental studies evaluated with the Joanna Briggs Institute Checklist for Quasi-experimental Studies,[13] obtained scores of 6 points,[24] 7 points([21,23] and 8 points [22,25] over a maximum score of 9 points.

Discussion

The results of the studies included in this systematic review do not permit generalizing that the educational interventions aimed at patients for the knowledge of pain and its management to be effective in controlling or reducing post-surgical pain, due to the controversy found in the results. However, the results found show greater pain relief in patients receiving these interventions, as well as lower incidence of pain in performing daily activities after the intervention, like mobilization, walking, or resting. Additionally, educational interventions improve the expectations of patients on post-surgical pain, modify negative preconceptions of opioid analgesics, and improve the use of analgesics during the post-operative period. Regarding prior studies that have only analyzed the association between the educational interventions and relief of post-surgical pain, this review contributes with the analysis of the benefits of the educational interventions to perform daily activities after surgery [16,18,21-23,25] or the relationship between the educational interventions and the vital constants (cardiac frequency, respiratory frequency, and blood pressure) of post-operative patients.[15]

Following the line of prior studies, most of the articles analyzed coincide in that the information provided during the educational intervention is an important tool to raise awareness and sensitize patients on the concept of pain and the need for its treatment, producing a behavioral change in patients toward this pain.[15-18,20,25] As shown in other studies, the results suggest a change, after the educational intervention, in the expectations of patients on post-surgical pain and modification of prior negative conceptions about opioid drugs used in pain management.[22-24] In this sense, the results from this review show that patients' increased knowledge improves its inclusion in the treatment, providing patients an active role, reducing their fear, anxiety, barriers, prejudice, and beliefs when using analgesics.[15,16,22-24]

However, although prior studies show the benefits of the educational interventions, certain studies in this review do not confirm this fact, not finding that the educational intervention presents any repercussion on relieving post-surgical pain or on the interaction of pain in daily activities. [16,17,20,22-24] Although most of the studies suggest that the educational intervention can be useful in managing post-surgical pain, said association cannot be confirmed because not all the studies found in this review are conclusive, and some articles lack sound scientific evidence to ensure the results.

The results from this review show that educational interventions carried out by nursing can improve relief of post-surgical pain.[22] In addition, nursing educational interventions reduce mobility problems, improve adherence to treatment after surgery[22], and increase patient satisfaction.[23] Nursing interventions aimed at increasing patients' knowledge about analgesia before the intervention help the person identify and control pain, thus, reducing possible barriers during treatment.[23,25] During the clinical practice, educational interventions help patients to assume an active role, allowing them to express their pain more precisely and learn that therapeutic alternatives exist.[23,25] Hence, educational interventions are a tool that help nursing professionals to improve the process of making shared decisions, adherence to treatment, and management of post-surgical pain.[22]

The principal strength of this review is that it has followed the recommendations of the PRISMA Declaration and has evaluated the quality of the studies included with different instruments, according to the type of study. The study had mainly two limitations: the first is that of having found few studies with not very high level of rigor and very diverse applied methodology, and the second, is that considering only articles published

in Spanish or English in the databases analyzed constitutes a limitation, when excluding possible relevant articles published in other languages.

The conclusion of this review is that educational interventions could influence on the relief of post-surgical pain, as well as aid in the development of daily activities, like moving about or breathing. Furthermore, educational interventions improve management of post-surgical anxiety and reduce barriers during the treatment follow up. In spite of the aforementioned, more rigorous studies are necessary, with larger sample sizes and higher methodological quality, which help to learn with certainty the effect of educational interventions in managing post-surgical patients with pain and extract relevant information that permits developing new pre-operative protocols that help to reduce pain and its post-operative complications.

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Original article

(In) visibility of notifications of violence against children and adolescents registered in a municipality in southern Brazil

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(In) visibility of notifications of violence against children and adolescents registered in a municipality in southern Brazil

Abstract

Objective. To know the perception of health, education and social service professionals about the records and notifications of violence against children and adolescents, carried out in a municipality in the south of Brazil. **Methods.** This is an exploratory, descriptive, and qualitative approach, specifically developed in places that integrate children and adolescents victims of violence. Ten professionals participated, including three nurses, one doctor, two social workers, two psychologists, one tutor, and one educator. Data collection was performed through a semi-structured interview. The statements were submitted to discursive textual analysis. **Results.** The analysis showed that the act of recording and reporting violence against children and adolescents is still not a routine practice for health professionals. The registration and formal communication of the information should be

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considered as a priority; however, the results showed that the protection of the victim seems to overlap with the registry. The study identified important elements in strategies for coping with violence against children and adolescents: centralization of notifications in a single service; creation of a notification flow; existence of an advisory team to deal with cases of violence; and completion of compulsory notification by education and social assistance professionals. **Conclusion.** For the professionals, the routine attendance of situations involving violence, but not formalized through the notification form, has contributed to the underreporting and invisibility of the cases.

Descriptors: nursing; domestic violence; child advocacy; mandatory reporting; registries.

(In) visibilidad de las notificaciones de violencia contra niños y adolescentes registradas en un municipio del sur de Brasil

Resumen

Objetivo. Conocer la percepción de los profesionales de la salud, educación y servicio social acerca de las notificaciones de violencia contra los niños y adolescentes, realizadas en un municipio del sur de Brasil. **Métodos.** Se trata de una investigación exploratoria, descriptiva, cualitativa, desarrollada específicamente en centros que integran niños y adolescentes víctimas de violencia. Participaron en el estudio diez profesionales: tres enfermeros, un médico, dos asistentes sociales, dos psicólogos, un consejero tutelar y un educador. La recolección de los datos se realizó mediante entrevistas semiestruturadas. Los testimonios se sometieron al análisis textual discursivo. **Resultados.** El análisis realizado muestra que el acto de registrar y notificar la violencia contra los niños y adolescentes aún no es una práctica usual en la rutina de los profesionales participantes. El registro y comunicación formal de la información debería ser considerada como prioridad, sin embargo, los resultados apuntan a que la protección de la víctima parece superponerse al registro. El estudio identificó elementos importantes en el direccionamiento de estrategias de enfrentamiento de la violencia contra niños y adolescentes, a saber: centralización de las notificaciones en un único servicio; creación de un flujo de notificaciones; existencia de un equipo asesor para la atención de los casos de violencia; diligenciamiento de la ficha de notificación por los profesionales de educación y asistencia social. **Conclusión.** Para los profesionales la atención rutinaria de situaciones que involucran violencia, pueden

no ser formalizadas a través de la ficha de notificación, lo que está contribuyendo en la subnotificación e invisibilidad de los casos.

Descriptores: enfermería; violencia doméstica; defensa del niño; notificación obligatoria; sistema de registros.

(In) visibilidade das notificações de violência contra crianças e adolescentes registradas em um município do sul do Brasil

Resumo

Objetivo. Conhecer a percepção dos profissionais de saúde, educação e serviço social, acerca dos registros e notificações de violência contra crianças e adolescentes, realizadas em um município do sul do Brasil. **Métodos.** Trata-se de uma pesquisa exploratória, descritiva, de abordagem qualitativa, desenvolvida especificamente em locais que integram crianças e adolescentes vítimas de violência. Participaram do estudo dez profissionais, sendo três enfermeiros, um médico, duas assistentes sociais, dois psicólogos, um conselheiro tutelar, um educador. A coleta de dados foi realizada por meio de entrevista semiestruturada. Os depoimentos foram submetidos à análise textual discursiva. **Resultados.** A análise realizada demonstra que o ato de registrar e notificar a violência contra crianças e adolescentes ainda não se configura como uma prática usual na rotina dos profissionais do setor saúde. O registro e comunicação formal das informações deveriam ser consideradas como prioridade, no entanto, os resultados apontam que a proteção da vítima parece sobrepor ao registro. O estudo identificou elementos importantes no direcionamento de estratégias de enfrentamento da violência contra crianças e adolescentes, a saber: centralização das notificações em um único serviço; criação de um fluxo de notificações; existência de uma equipe assessora para o atendimento dos casos de violência; preenchimento da ficha de notificação compulsória pelos profissionais da educação e assistência social. **Conclusão.** Para os profissionais o atendimento rotineiro de situações que envolvem violência, porém não formalizadas através da ficha de notificação, o que vem contribuindo para a subnotificação e invisibilidade dos casos.

Descritores: enfermagem; violência doméstica; defesa da criança e do adolescente; notificação compulsória; sistema de registros.

Introduction

Violence against children and adolescents is characterized as an epidemic with serious consequences for individual and collective health.[1] According to the results of the study "The Influence of Geographical and Economic factors in estimates of childhood abuse and neglect using childhood *trauma questionnaire: a worldwide meta-regression analysis*, Brazil is the country with the highest estimates of child maltreatment in the world.[2] The complexity of the phenomenon that is usually treated in a veiled way by the aggressors and victims justifies and demands from the health professionals, the notification of cases of violence against children and adolescents by the competent authorities. According to Brazilian law, any violation of the rights of children and adolescents must be notified.

By Ordinance 1271/2014,[3] compulsory notification must be performed in all health units of public or private services. In cases of sexual violence or suicide attempt, after knowing the occurrence, the notification should be done. In other types of violence, it can be carried out weekly.

The cases of violence against children and adolescents are included in the item on domestic violence and/or another violence type, considered as injuries, as they represent damage to the physical or mental integrity of the individuals, as they are caused by harmful circumstances, such as injuries resulting from interpersonal violence, aggression, and maltreatment.[4] These injuries must be reported to the local authority, carried out by health professionals or heads of health institutions, even if it is a suspicion, by completing the notification form, whose data are inserted in the Notification of Injury Information System.[5]

The scientific production about the notification of intra-family violence against children and adolescents has intensified since the 1990s and has been the subject of a study by several national and international authors on the duty to notify it.[6,7] However, despite this obligation, it is understood the plurality that involves violence, necessary to contextualize the problem and discuss it based on the new tendencies of care, which involve community services, and the daily practices of the professionals in the network. A study by Garbin *et al*.[8] identified professionals' difficulties in reporting violence against children and adolescents. These difficulties include the lack of professional training on reporting and actions to be taken, fear of retaliation by the aggressor, structural issues related to the unsatisfactory performance of the competent bodies in complying with protective measures, difficulties or constraints in completing the notification form.

Knowing the perception of professionals who work directly in places of entry and hospitalization of children and adolescents victims of violence, can point out possible ways to overcome gaps and deficiencies faced by these professionals, giving visibility to a phenomenon that is still veiled in society. Thus, this study aims to know the perception of professionals, about the records and reports

of violence against children and adolescents, carried out in the social and health services of a municipality in the South of Brazil.

Methods

This is an exploratory, descriptive, and qualitative approach, developed in a municipality in the extreme south of Brazil, specifically in places that integrate children and adolescents victims of violence. Ten professionals in which three were nurses, one was a lawyer, one was a doctor, one was a social worker, two were psychologists, one was a tutor, and one was an educator participated in the study. These professionals work in the following services: Family Health Strategy, Family Health Support Center, Specialized Referral Center in Social Assistance, Tutelary Council, Secretariat of Citizenship and Social Assistance, Health and Teaching Secretariat. The following inclusion criteria were used: to know the work of the municipality on the theme. The time of service was also considered, with preference to professionals who had been working in the workplace for over a year. The exclusion criterion was the non-location of the participant, after three attempts to meet.

The ethical prerogatives of Resolution 466/12 of the National Health Council[9] were respected and the study was approved by the Health Research Ethics Committee of the Federal University of Rio Grande under CAAE: 49775415.8.0000.5324. When signing the Free and Informed Consent Form, the interviewees were explained the purpose of the research and guaranteed the right not to participate or to interrupt their participation at any time. Data collection took place through a semi-structured interview, from April to June 2016, focusing on the existence of standardized instruments for reporting, record quality and continuous flows of information for its accomplishment. Besides the semi-structured interview, consultations were used in the forms of notification of aggravated violence, and documents were available by the coordinators of the Secretariats of Health, Education and Social Assistance.

The study was carried out in the work environment of each professional, individually, at a time and place previously scheduled, saving the adequate progress of the professionals' work. Some care was taken to create a private and safe environment: an explanation of the purpose and objectives of the study, ethical issues related to human research, such as the right to refuse to participate in research, respect for anonymity through code identification that guarantees the confidentiality of the information obtained, through Letter E, following the order of interviews. The content of the interviews was subjected to a discursive textual analysis, following the rigorous and thorough reading, and its deconstruction, highlighting the units of analysis.[10]

Results

Three categories emerged in the process of data analysis: (De) valorization of notification and records of violence against children and adolescents; (In) visibility of information records on violence and Municipal performance in coping with violence: notification as a guarantee of rights.

Characterization of study individuals

Regarding the characteristics of the participants of this study, nine were female and one male, aged between forty-one and fifty-eight. Working time in the institutions ranged from two to twelve years.

(Table 1)

Table 1. Sample of individuals interviewed, according informers and institution

Informers	Institution/services
E1	Health
E2	Social
E3	Health
E4	Health
E5	Social
E6	Education
E7	Health
E8	Health
E9	Social
E10	Social

(De) valorization of notification and records of violence against children and adolescents

According to the report of the professionals, despite their obligation and their value as a way to guarantee the rights of children and adolescents in their care, notification is a practice still little used in the routine of professionals, perhaps due to the absence of an organization institutional, as evidenced here: *we know that if we suspect, we must notify it, but in some cases of violence we see, the professional does not do it, it is solved in the unit with the family, perhaps because they [professionals] understand that to notify responsible bodies, to the Tutelary Council, sometimes it is not resolving (E1); Depending on the type of violence, we did not make formal notification for lack of information, but for fear of losing the family (E3). I think the most important thing is the protection of this child (E7). It happens a lot that we make the notification to the responsible organs and nothing happens. Besides not being resolved, it still exposes the professional (E5). Because it is a complex issue, this has not been an easy task for professionals, given the fear of the repercussions that violence has generated for both families and working professionals. Talking in a notification is easy, I know its importance, but many colleagues had to change units because they were threatened (E1). We have a professional only to fill the notifications so you cannot identify who notified it (E4). In situations of violence, I believe that the key would be a team that could support us, even though the Family Health Support Center has helped us a lot (E3). However, at the same*

time that the professionals recognize a certain devaluation of the notification, they identify that the municipal management has invested in training on the individual and emphasize an intense debate about the completion of the notification form.

(In) visibility of information records on violence

Regarding the information obtained, through the medical records of different investigated services, the researcher can verify the lack of details in the collected materials, which has hindered to elucidate many cases of violence. There was incomplete data in the records of the referral services, in the records of the Notification of Injury Information System, Disque Denuncia 100, not including the necessary information. Another relevant fact in this study is the notifying body. The notifications that arrive until the specialized service are through denunciations made by dialing 100, not having the information of the professional who has notified. According to the professionals' reports, the fragmentation of records has led to deficiencies, mainly in diagnosis and notification by professionals and institutions, besides apparently constituting an act disjointed with the existing protection network in the municipality. According to Education, Health and Social Assistance professionals: *The accuracy of the problem of violence that the municipality faces is not known, each secretariat [health, education, social assistance] has its instrument for registration (E2). The notifications should be centered on a single service, but in practice, this does not happen (E8). There have already been targeted meetings for this purpose, but they are still on paper (E10). In education, teachers notify the coordination, we investigate the situation and pass the case to the tutelary board, but nothing formal (E6).*

According to one respondent's report, there have been several attempts to standardize the instruments used in reporting units. In the units of the respective secretariats, (health, social assistance, and education), training was carried out to mobilize professionals to incorporate the notification into their routine work, but without success. Another important device is to enter the Notification of Injury Information System, noticing that in the municipality, apparently, there are no cases of violence registered until then, but we know that at least one case of violence per day is accompanied by protection services. Therefore, the communication actions have required that demand and promote continuous flows of information to fulfill its objectives, especially with the protection organs. However, the Tutelary Council, as a body for the protection and management of information on violation of rights, does not have a system that allows the visualization of cases of violence that reaches the service, which further weakens the identification of a violation of rights.

Municipal action in coping with violence: notification as a guarantee of rights to children and adolescents

The results showed that in the municipality, there is a lack of municipal management investments in the consolidation of public policies directed at children and adolescents, especially regarding notification. According to representatives of the Secretariat of Citizenship and Social Assistance, there is no commission to confront sexual violence against children and youth in the municipality. Thus, the conditions offered by the municipal manager to the protection services observed and pointed out by the service coordinators are a problem that persists for years. Violence is linked to a social context permeated by barriers that hinder the notification process. *The municipality lacks a service policy, such as a structure capable of providing protection services with conditions to perform effective work, with computers available for reference and against reference (E8), adequate physical conditions (E9), systems that provide an accurate diagnosis of the situation of violence in the municipality and that allows data to be crossed between the involved organs (E10).*

Discussion

Although professionals advocate the protection of children and adolescents, they do not register a case of violence, bringing up a problem present in every day that is underreporting, which can corroborate so many cases are excluded from official estimates. [11-13] Underreporting of violence is still a reality, not only in the researched context, but in many countries, perhaps because it is culturally recognized as a punishment process, and not as assistance, impairing the true dimension of violent events.[13] According to a report by the European Union Agency for Fundamental Rights, almost all of the notifications in the European Union are compulsory. However, not all countries have institutional notification protocols or documents that establish the responsibilities of professionals. Also, another problem identified in countries such as Denmark and Lithuania and strongly related to underreporting is the anonymity of professionals, which has discouraged professionals from reporting.

In Brazil, little is known about the standards adopted for its effective operationalization. Each state has its notification flow, little is known about the mobilization of resources effectively triggered by compulsory notification by health professionals. [15] Although there is no institutional culture to report a situation of violence, this act is essential in confronting violence against children and adolescents and in the process of restoring their rights. Besides stopping the abuse and initiating measures of protection and assistance to children and adolescents in situations of violence and their families, it also provides information for assessing the local situation and the need for public investments.[16]

The lack of detailed information in the medical records, incorrect or incomplete data are problems pointed out in other studies,[12,15] which has hindered to confirm or elucidate cases of violence. Possibly, because of the lack of knowledge of the professionals about the support network for victims, disbelief in their efficiency or fear of the professional being compromised, professionals have stopped making the notification.[17] Considering that information is essential for knowledge and for decision making, the results demonstrate an apparent lack of an institutional culture of valuation of records. The information that should be considered as a priority, because of its importance, according to the results presented, the protection of the victim seems to override the registry. It is clear that statistics on violence against children and adolescents reveal only part of the cases of violence that children and adolescents have subjected daily.[18] Facing this fact, it is evident that there is a need to improve information systems, to improve its quality, integrating other systems such as those managed by the Public Ministry and judiciary.

There are many challenges in the area of health that affect the qualification and support of professionals in situations of violence. Professionals need to feel secure and supported to make the notification and to visualize the results of their action. Although the notification may not have a transforming effect on immediate reality, it is certainly an instrument that allows visibility to the manifestations of violence, sizing the intensity and characteristics of the phenomenon.[18]

Conclusion. The study identified important elements for coping strategies on violence against children and adolescents: centralization of notifications in a single service; creation of a notification flow; the existence of an advisory team to deal with cases of violence; and the completion of compulsory notification by education and social assistance professionals.

The adoption of standardization in information is a demand pointed out by professionals since 2002 when the referral service specialized in social assistance in the municipality was implemented. The flow of notifications seems to be an urgent need pointed out by the interviewees, given the small number of data on violence. Thus, the adoption of a compulsory notification form in all secretariats has been working (health, education and social assistance), so the notifications are centered on epidemiological surveillance, which

is responsible for registering in the Notification of Injury Information System. The existence of an advisory team to deal with cases of violence could be characterized as an institutional policy to address this problem. This would allow the involvement of all professionals, so they can deal, investigate, diagnose, attend and refer cases with institutional support, and not act by developing only individualized and fragmented actions.

In the reality found in the municipality, it is relevant to approach the theme, so all areas of knowledge, working with children and adolescents, can exercise their co-participation, giving visibility to a problem as serious as violence. This research shows important contributions to collective health, considering that, to ensure the protection and guarantee of the rights of children and adolescents and overcoming situations that violate their rights, requires knowledge in the municipalities are articulating in the face of cases of violence. Thus, the study highlights the need for a greater commitment in the preparation of professionals for the phenomenon, since the notification has been an increasing challenge for professionals in their different areas of activity, which has been confronted with difficulties arising from this training. It is also suggested new studies that will complement knowledge gaps and contribute to improving the quality of life of the child population.

As a limitation of the study, there is the accomplishment in a single scenario, since the actions of notification of violence and sexual exploitation against children and adolescents have a national scope. The replication of the study in other realities may increase the visibility of the obstacles to the necessary implementation of the notification of violence against children and adolescents in health services.

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