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Editorial

It is with great satisfaction that I present the first issue of the 2013 Acta Paulista de Enfermagem. When I accepted the role to be chief editor of this journal, my first idea was to develop an editorial project which would place us among the best international nursing journals.

We began with the professionalization of the editorial office, adopting ScholarOne which is an international reference system that processes online web submission of manuscripts by authors and enables the flow of review and evaluation by means of intervention of the chief editor, associate editors and ad-hoc peer reviewers. The layout of articles began to be conducted in the editorial office of Acta, and soon, we will adopt the system of intelligent marking in the XML format, required by PubMed Central.

To collaborate with authors and readers we are using social networks to disseminate information about how to write original articles, the scientific method of investigation, and the essential steps for planning and developing of scientific research: how to develop a research plan and its corresponding project; formulating the object of the research; review of specialized literature; selection and application of research instruments; the collection, management, and analysis of data; presentation of results; editing and the choice of ways for disseminating results; and, employing critical analysis in reading articles of scientific dissemination related to your research topic.

Our new journal website (www.unifesp.br/acta) is dynamic, interactive and pleasing to the reader, presenting all the necessary information for collaborators: readers, authors and reviewers.

I believe that the quality of the original articles published should contribute to the advancement of nursing knowledge and increase the level of citation and the applicability of the information provided by the Acta Paulista de Enfermagem, making it an excellent vehicle for the dissemination of scientific knowledge in nursing generated through the rigor of the research methodology and of ethics.

Sonia Maria Oliveira de Barros
Editor-in-Chief
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Repercussion of noise in the neonatal intensive care unit
Repercussões do ruído na unidade de terapia intensiva neonatal

Gabriela Menossi Grecco¹
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Maria Magda Ferreira Gomes Balieiro¹
Tereza Yoshiko Kakehashi¹
Eliana Moreira Pinheiro¹

Abstract
Objective: To identify repercussion of noise in the neonatal intensive care unit on mothers, newborns and on interactions of neonates with healthcare professional from the mothers’ perspective.

Methods: This descriptive cross-sectional study was carried out in the neonatal intensive care unit. The study population was composed by 95 mothers. Data were collected using formularies. The statistical analysis was descriptive.

Results: Mothers’ perception of noise in the unit caused repercussion on neonates such as agitation, cry, irritability among other. Mothers’ also reported to have headache, agitation and tendency to cry, which led them to touch less and speak softly with their babies.

Conclusion: Repercussions of noise perceived by mothers on themselves and on babies’ behavior and physical changes were associated with difficulties of mothers to keep attention and to interact with healthcare professionals.

Keywords
Pediatric nursing; Nursing care; Nursing research; Intensive care units, neonatal; Noise

Descritores
Enfermagem pediátrica; Cuidados de enfermagem; Pesquisa em enfermagem; Unidades de terapia intensiva neonatal; Ruído

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Resumo
Objetivo: Identificar as repercussões do ruído da unidade de terapia intensiva neonatal sobre as mães, recém-nascidos e interações com o filho e profissionais de saúde, a partir da percepção materna.

Métodos: Estudo descritivo transversal, realizado em unidade de terapia intensiva neonatal. A amostra constitui-se de 95 mães. Um formulário foi utilizado como instrumento de coleta de dados. Para análise dos dados utilizou-se estatística descritiva.

Resultados: Na percepção das mães o ruído da unidade traz repercussões sobre o neonato provocando agitação, choro, irritabilidade entre outros; desencadeia-lhe cefaleia, agitação e vontade de chorar, levando-a tocar menos e falar mais baixo com o filho. Referem dificuldade em manter sua atenção durante a interação com o profissional.

Conclusão: As repercussões do ruído percebidas pela mãe tanto sobre si como para o seu filho, abrangem alterações comportamentais e físicas; associadas à dificuldade materna de manter a atenção ao interagir com o profissional de saúde.

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Introduction

The birth of a premature and/or sick newborn constitutes a crisis for the family because parents have problems to identify in physical and behavior characteristics of the child, differently from what was expected, their previous ideal dream, so causing frustrations.\(^{(1)}\) This situation could motive opposite feelings, that is, at one side there is a hope represented by the birth and the other side the symptoms such as depression, anxiety, sadness, fear, insecurity, distress, among other.\(^{(1-5)}\) This situation could difficult the establishment of an affective bonding and affect negatively families dynamics.

The situation could be worse when the newborn is hospitalized in the neonatal intensive care unit (NICU), a restrict and unknown environment that impact and intimidate most of families.\(^{(6)}\) In addition, this environment increases the feeling of vulnerability, impotence, frustration, fault and revolt.\(^{(2-4)}\)

Due to the high complexity of procedures and technology used in the NICU, this environment conditions include intense sensorial stimulus such as excessive lighting and noise which are incompatible with well-being of neonates, family and professionals.

Currently, the literature in nursing has been emphasizing the need of an ecological environment in the NICU mainly concerning babies exposure to loud noise.\(^{(7-11)}\) Noises are loud or confused sounds at frequency physiologically incompatible with human ear that may cause physical lesions, physiological and behavioral changes.\(^{(12)}\) In most of cases noise in the NICU and inside incubators is due to alarms produced by life support devices, flow of medical gas, communication among professionals and during activities of nursing care.\(^{(13-16)}\)

Newborns exposed to high sound pressure levels (SPL) could present hypoxia, increase of adrenocorticotropic hormone and adrenaline release, increased heart rate, systemic vasoconstriction, pupil dilation, elevated blood and intracranial pressure, increased oxygen consumption rates, and energetic expenditure, which in long-term could result in delayed weight gain. Hearing loss due to long exposure to noise among hospitalized newborns in the NICU is a problem widely discussed in the literature.\(^{(7,8)}\)

Among deleterious effects of high SPL for professionals the most common are increased blood pressure, changes in heart rate and muscle tone, headache, hearing loss, low concentration power, irritability, burnout syndrome and job dissatisfaction.\(^{(9,10)}\)

Brazilian studies have been showing high SPL within the unit and inside incubators.\(^{(13,14)}\) However, few studies are published on this topic mainly considering the health service user’s perspective. Therefore, because of the importance of an environment that could enable an affective bonding between mother and child after birth, as well as to provide an adequate communication between family and health professional, this study attempted to verify if noise in the NICU could change interaction between the mother and her baby, and also mothers and health professionals.

In this study we aimed to identify repercussions of noise in the neonatal intensive care unit on mothers and newborns and also on their interaction. The interaction between mothers and healthcare professionals was also verified.

In this study the term perception is used as the act to acquire knowledge by sensitive organs. In other words, to notice.\(^{(17)}\)

Methods

This descriptive cross-sectional study was conducted in two emergency room of the Neonatal Intensive Care Unit (NICU) at an academic hospital in São Paulo, SP, Brazil. The rooms are placed in the eighth floor of the hospital and have four beds exclusive for patients of the public health system enrolled in the hospital’s prenatal care program. The unit does not have adequate physical structure to reduce high SPL particularly for presence of many professionals, students and families. The single intervention in this front is called “the sleeping time” that consists in environmental measures such as to reduce lighting and noise, and minimal manipulation of newborns.

Due to the limited space within the unit, parents are allowed to stay inside NICU from 9 a.m. to 9 p.m. In addition, professionals often report neo-
nate clinical conditions and treatment management for families close to the incubator.

To data collection all national and international ethical and legal aspects of research on human subjects were followed.

Independent variables were age, mothers’ formal education level, number of visits to the baby in the unit, duration of baby’s hospitalization, previous experience of hospitalization of a family member at NICU.

The dependent variable “mothers’ perception of noise” was measure according to noise level, repercussion of noise on them and baby, mothers’ reactions to the noise, professional management, influence of noise on interaction with her baby and with the multidisciplinary team. Data was collected using interviews and structured forms with open and closed questions.

To validate forms, a pre-test was conducted with mothers who had newborns hospitalized in other neonatal units and who had similar characteristics. In general, interviews lasted for approximately 15 minutes.

The study population was composed of 95 mothers who babies were hospitalized during the period of this study. Inclusion criteria were mothers who child was hospitalized in the NICU and visited their child for at least three days excluding the day of the interview. All mother agreed to participate. The number of visits was defined as three because we believed to be enough for mothers have a perception of the noise in the unit. Mothers who reported hearing loss and psychiatric disturbs were excluded.

For data analysis we used absolute, relative, mean and standard deviation (SD). The analysis of open question was done considering the frequency of answers. Spearman’s rank correlation coefficient was used to analyze relation between numbers of days that families visited newborns in the NICU along with variables of mothers’ perceptions related to the negative impact of noise on them, on their child, and in the level of care perceived by interactions with the professional.

The receiver operator characteristic curve (ROC) was used to verify if number of days that mother visited their child in the NICU was different from any of the characteristics evaluated.

This study followed national and international ethical and legal aspects of research on human subjects.

Results

Considering independent variables the sample of this study presented: a) mean age of 28.8, SD of 6.9 years; b) formal education level of 52.6% for complete high school and 30.5% for incomplete high school; c) mean number of visits to newborns was 16.7, SD of 26.8 days; d) duration of newborn’s hospitalization was 18.8, SD of 28.3 days; e) those who never been in a NICU before were 93.7%.

Mothers (80%) considered that NICU was noisy. From the total, 25.3% mentioned that NICU had mild noise, 22.1% perceived more or less noisy, 18.9% considered the unit noisy and only 13.7% classified the unit as very noisy.

Regarding discomfort in the environment related to sound, 59.1% of mothers reported that noise disturbed them, 29.6% perceived the environment as noisy but it did not disturb, and 11.3% did not report any discomfort. Mothers’ feeling when a high noise in the unit was perceived was agitated (23%), tense (42%) wish to cry (20%) and headache (15%).

Those mothers who most visited the unit perceived a higher discomfort (mean 20.9; SD 35.2 days) (Figure 1).
A total of 69.7% of participants perceived that repercussion of noise in the NICU on their babies disturbed the child and, among them, 32.1% considered that their baby was very disturbed due to the child agitation, grumbling, crying and movements that seemed that he/she was scary or had fear shown by facial expression of pain. Mothers who most visited their child had higher perception of disturbance that noise caused on their baby (mean of 20.1, SD 34.3 days). (Figure 2)

ROC had sensibility of 0.96 and specificity of 0.65, it also indicated that mothers who visited their child in the ICU for more than eight days had high probability of not change tone of voice in noisy situation (Figure 3).

Interestingly, 50% of participants reported that when the environment was noisy they had problems to concentrate on while the professional were explaining something to them. For variables we found that most frequent visits of mother to the newborn in the NICU (mean of 12.9 SD 8.7 days) were associated with high proportion of difficult to concentrate during explications about baby’s health status. (Figure 4)

Several studied had reported high level of stress in parents caused by their child hospitalization in the
NICU. This stress is not only because of suffering with newborn’s critical health status but also because the NICU is unknown environment that may cause fear on them. Little is known about consequences of noise in parents, how they perceive and understand it. Findings of this study showed that noise in the NICU was a disturbance factor that increased mothers’ stress. This study reinforced the importance of noise management in the NICU. In addition, some studies have detected high level of sound pressure, over the levels recommended by regulatory agencies, in the NICU and inside incubators.

Some authors considered the importance of an adequate environment. Responses of newborns to the first external stimulus are crucial to establish an affective bonding between families and their babies. In this sense, for parents is easier and motivator to interact with their child while perceive a positive response. From stages that goes from deep sleeping and crying, the state of alert inactivity is the better to promote interaction with the baby who at this state is calm, alert, had low motor activity, regular breathing and sensorial systems such as hearing more opened for interactions. This state also help the caregiver to delivery a better care for the baby.

However, more intense environmental stimulation such as excessive lighting and loud noise, could lead the baby to become more alert and with tendency to cry. Babies exposed to an excessively noisy environment may lead parents to give less attention to their babies, therefore affecting negatively the interaction and bonding formation with parents.

This study data indicated that most visits to NICU were associated with high perception of noise that disturbed mothers and their baby. For this reason, longer hospitalization could have a negative effect on mother, increase stress, and as a result, reduce interaction between the mother and her child. Another study, however, reported that professionals’ perspective was that noise do not affect families, and it suggested a development of strategies by multidisciplinary teams to receive better parents who baby are hospitalized for longer periods, giving emphasizes to an humanized care in order to include families.

According to mothers, the noise also affected communication with health professionals because during professionals’ explanations related to babies’ clinical status, most of them were unable to be concentrated. The attention for families in the NICU expects that health team promote adequate conditions to communicate with them during hospitalization. Professionals should be open to answer questions and provide information regarding the care delivered, diagnosis, treatment and prognosis of the child. Such actions are crucial to promote a reliable environment.

In this context the family has the chance to report healthcare professionals their feelings, fears and concerns. However, to understand orally communication is a complex process that involves identification and comprehension of words articulated that may lead correct understanding of the message. Therefore, the importance of good acoustic conditions in the NICU is justified. In addition, the literature report that even normal hearing people complaint about the difficulties to understand others inside a noisy environment. Hence, communication between family and professionals in the NICU with elevated SPL could be impaired and, as a result, many important information are lose, which might cause conflicts between parents and professionals and also promotes a less humanized environment.

Based on mothers’ perspective this study revealed one aspect of the ecological environment in the NICU, which indicated the influence of noise in interaction between mother and infant in the first phase of a vital cycle. It is important to highlight that first interactions are vital for parents and can reflect on the quality of interaction with their child in the future. Another important fact is that an environment free of noise stimulates parents to spend more time in the NICU with their child. In addition, to spend a long time during neonates hospitalization is a right for parents provided by the law.

Further studies are encouraged to understand better what consequences a noisy environment could cause to families who child is hospitalized at a NICU.

Considering findings of this study it is suggested that health services should promote educa-
Repercussion of noise in the neonatal intensive care unit

Conclusion

Findings showed that repercussion of noise perceived by mothers on themselves and on neonates caused physical and emotional changes. It is verified that changes compromised areas related to ability of interactions. This situation could result in a decreasing of affective and sensorial changes between parents and children, therefore it could compromise the bonding and, as a consequence, psychobiology needs.

Other repercussion of noise in the NICU pointed out by mother was the difficult to be concentrated during communication with health professional.

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Collaborations

Grecco GM; Tsunemi MH; Balieiro MMFG; Kakehashi TY and Pinheiro EM contributed to the design of the study, analyzed and interpreted data. They were also responsible to draft the paper, critical review and final approval of proofs.

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Myocardial revascularization: strategies for coping with the disease and the surgical process

Revascularização miocárdica: estratégias para o enfrentamento da doença e do processo cirúrgico

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Alacoque Lorenzini Erdmann¹
Gabriela Marcellino de Melo Lanzoni¹
Giovana Dorneles Callegaro Higashi¹

Abstract

Objective: Knowing the strategies used by patients in coping with coronary heart disease and myocardial revascularization surgical procedure.

Methods: The Grounded Theory method was used as a methodological framework for the reading of data from a larger study entitled: Contextualizing the surgical experience and the living process of the patient undergoing myocardial revascularization. Data collection was conducted from October 2010 to August 2011, through semi-structured interviews with three sample groups (patients, relatives of patients and health professionals) and 23 participants.

Results: The results indicate the strategies used by patients who underwent a surgical revascularization process, which are: family, spiritual and professional support.

Conclusion: The experience of cardiac surgery modifies the living process of cardiac patients and the used strategies make the experience less traumatic to them. Thus, these data provide the theoretical basis for nursing care.

Keywords
Myocardial revascularization; Coronary disease; Nursing; Perioperative nursing; Nursing care

Descritores
Revascularização miocárdica; Doença cardíaca coronária; Enfermagem; Enfermagem perioperatoria; Cuidados de enfermagem

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Resumo

Objetivo: Conhecer as estratégias utilizadas por pacientes no enfrentamento da doença cardíaca coronária e do processo cirúrgico de revascularização miocárdica.

Métodos: Utilizou-se a Teoria Fundamentada nos Dados como referencial metodológico para a releitura dos dados de um estudo mais amplo intitulado: Significando a experiência cirúrgica e o processo de viver do paciente submetido à revascularização do miocárdio. A coleta de dados foi realizada de outubro de 2010 a agosto de 2011, por meio de entrevista semiestruturada, com três grupos amostrais (pacientes, familiares de pacientes e profissionais de saúde) e 23 participantes.

Resultados: Os resultados apontam as estratégias utilizadas pelos pacientes submetidos ao processo cirúrgico de revascularização miocárdica, quais sejam: apoio familiar, espiritual e profissional.

Conclusão: A experiência da cirurgia cardíaca modifica o processo de viver do paciente cardíaco e as estratégias utilizadas tornam a vivência menos traumática ao paciente. Logo, tais dados fornecem base teórica para o cuidado de enfermagem.

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**Introduction**

The myocardial revascularization surgery (CABG) is defined as a process of restoration and preservation of the vital capacities. It aims the return of the patient's physical, mental and social wellbeing.\(^1\) In Brazil, in 2011, around 100 thousand cardiac surgeries were performed. Among these, more than 50% were related to myocardial revascularization, an index comparable to international literature\(^2\).

The discovery of coronary heart disease in most cases can be interpreted by the patient as a synonym of health loss and functional disability.\(^3\) Facing the indication of cardiac surgery some feelings emerge, such as fear of death and rebellion against God, due to the association made between the disease onset and a superior power.\(^3\) In this sense, the nursing professionals with their knowledge and experience can assist the patients in coping with coronary heart disease and the myocardial revascularization surgical process.

Human beings as complex forms of existence, connected with their parts and their whole, establish relationships with themselves, with others and with the environment in which they live. In order to understand one being, it is necessary to consider the established relationships, as well as respect the internal and external influences of this environment.\(^4\) The patient with coronary heart disease requires full attention of the health team, since besides the incidence and severity of the disease, social and environmental factors shall be known for professional intervention.\(^1\) Given this scenario, it is important to seek knowledge about the coping strategies to overcome difficulties and negative feelings used by patients who underwent the myocardial revascularization surgery.\(^3\)

Thus, the study aims to know the strategies used by patients in coping with coronary heart disease and the surgical process of myocardial revascularization.

**Methods**

This is a qualitative study of exploratory and descriptive character which used the Grounded Theory method\(^5,6\) as a methodological reference. The study was conducted based on the reinterpretation of data from a larger study, entitled: Contextualizing the surgical experience and the living process of the patient undergoing myocardial revascularization. In this larger study, the categories that comprise the results give visibility to a component called 'strategies', according to the study method.\(^6\)

Data collection was developed at the Institute of Cardiology of Santa Catarina, which specializes in cardiac surgery, located in southern Brazil. The study included patients who underwent CABG, their relatives and health professionals, totaling 23 participants divided into three sample groups. The first group consisted of eight patients. The second group was formed by six health professionals and the third group consisted of four patients and five relatives, totaling nine subjects, respectively identified by the letters “E”, “P” and “F” to preserve the identity of participants. The theoretical model was validated by a group of patients who underwent CABG surgery at the same institution.

Data collection was conducted between October 2010 and August 2011 through individual, semi-structured interviews and digital voice recording. For the beginning of the study with the group of patients the interviews were opened with: tell me about your experience regarding your CABG surgery. The interviews were directed by the researchers, from the responses of participants. The process of open, axial and selective coding was conducted during the stages of collection and analysis, from the comparison of data until reaching the study phenomenon.\(^6\)

The comparative analysis of data of the first sample group (patients) identified the hypothesis that the health professionals who provide assistance during patients hospitalization and after their discharge participate in coping with the process of surgical myocardial revascularization. The analysis of the statements of health professionals (second sample group) pointed out the hypothesis that the relatives (third sample group) have a complicating or facilitating role in coping with the surgical process experienced by the patient with coronary heart disease.
Myocardial revascularization: strategies for coping with the disease and the surgical process

The data analysis allowed the identification of three categories that sustained the phenomenon “realizing the process of experiencing myocardial revascularization surgery as an opportunity of maintenance of life, associated with coping with significant changes in lifestyle”, which are: realizing the family in coping with the disease and surgery; having faith and hope; participating in the rehabilitation program. The development of the study complied with national and international ethical standards.

The study complied with national and international ethical standards of researches that involve human beings.

Results

The category called “realizing the family in coping with the disease and surgery” is composed of two subcategories. The first subcategory, called “feeling the presence and support of the family”, reveals that the presence of family members during hospitalization is motivating to patients; a joy when faced with coping with the surgical process. Without family members the patient would not even have the power to undergo surgery. This can be seen in the following statement:

They [the family members] were very important; [...] made me happier (F9).

The patient, given his state of fragility after the indication of cardiac surgery, needs the family members in the sense of searching for security and support in a strange environment, different than the usual.

It means everything! I have my kids to help me. It is better to be helped by my children than by the hands of a stranger (E5).

The family support smoothes the acceptance of surgery, with a consequent decrease in the anxiety and stress generated at the moment of surgery indication.

Without them [the family], I would have run away because it is very sad to stay in one place and not have the support of the family (F9).

According to health professionals, the family is an important ally in coping with the surgical process because it has the role to reassure the patient. Therefore, the family is inserted in the pre and postoperative nursing guidelines to receive information, from the perioperative period until recovery and rehabilitation after discharge.

Most family members try to talk and leave the patient calm... We [professionals] mention the importance of that in the orientation (P6).

The family more or less knows how it is going to happen... This participation in the preoperative guidance is pretty cool. I say the family must be together during treatment (P2).

The family relationships, when quarrelsome, hinder the establishment of a family support net for the patient. Thus, the interference of health professionals is necessary. Sometimes the disease and hospitalization are a means of reestablishing relationships and smoothing the resolution of family issues. On the other hand, when this does not happen, these problems alter the emotional balance of the patient.

No use in bringing problems [family], no good, ‘cause otherwise it will make the patient more anxious, more worried (P6).

Sometimes at home the problem is not solved, but as a family member is ill, it can be solved or become a snowball that interferes even in patients who often feel outraged, bothered with the situation (P3).

The second subcategory, called “family relationship after surgery”, shows that the relationships of family cooperation and care commonly increase after hospital discharge. Therefore they favor the recovery of patients, but the autonomy with self-care is perceived as an important factor to their rehabilitation.

After a month or so I [patient] was already here doing rehabilitation and my son came along with me. Then, later I said: you can stay home, let me go alone ‘cause I don’t want somebody following me around for the rest of my life (F9).

Both patients and their families face changes in family routine and in life habits after hospital discharge, which often trigger situations of stress and conflict. Pressure from the family to the patients regarding their health may reflect in reduction of their interactions and social life.
I [wife] always talk to him more calmly. I try no to be aggressive in terms of pressure, ‘cause I know it’s not helping... Sometimes he [patient] refrains from going to places because people talk and nag; he doesn’t participate ‘cause he doesn’t want to hear it. I can tell he gets hurt (F4).

The category called “having hope and faith”, through the subcategory called “using spiritual resources”, identifies that faith and belief in a Higher Being help coping with the disease. Faith means having hope and believing everything will be alright.

My guardian angel helps me a lot. If we don’t hold onto him by our side, light a little candle and say a prayer, we won’t make it (E3).

Health professionals find in the faith of patients a subsidy to help them, which serves as an incentive for them to use spiritual resources in overcoming and coping with the difficulties inherent to the process of living the myocardial revascularization surgery.

I pass this part of religiosity a lot that God is there, present at the time [of the surgery], that He is standing there and everything will be just fine, they’ve got to trust (P3).

The category called “participating of the rehabilitation program” unleashed three subcategories. The first called “discovering the benefits of cardiac rehabilitation” refers to the possibility that family and patients attend lectures given by health professionals. The patient is encouraged and stimulated to engage in the cardiac rehabilitation program available at the institution.

I attended lectures promoted in the auditorium and it was like relaxing, having a behavior like that... less stressful and it has helped me in a general way (E6).

Besides offering cardiac patients the services of monitoring and fitness, the cardiac rehabilitation service also favors and enables the socialization of their experiences. It is considered that recently operated patients feel insecure with their health conditions and the new life habits to which they will be conditioned. Social interactions can reduce anxiety and prevent depression.

Sometimes here in rehabilitation I meet a lot of nice people. Here we chat... Sometimes there are people who have undergone surgery 20 years ago. Then I’m glad (F9).

The second subcategory, called “cardiac rehabilitation: medical monitoring as a reward to adherence” comprehends an easier access to medical monitoring. Consequently, the prescription of medication and the request for exams are advantages offered to patients who participate of the cardiac rehabilitation program, which aims to maintain the number of adherents and the continuity of the program.

I wanna go through a battery [of medical tests]; I wanna do everything because who is in rehabilitation can schedule exams and appointments very easily there [at the hospital’s outpatient clinic] (F1).

The third subcategory called “dodging difficulties of access to the cardiac rehabilitation program” reports that many patients fail to attend the program and receive the benefits offered due to financial reasons, difficulties of access, return to work routine, lack of time or lack of motivation. These patients are advised to perform daily walks or join other groups that deal with physical reconditioning, according with the cardiac surgery and the clinical condition.

It is near here where I do now... It is good here because there is a gym..., even on rainy days we do it. Yesterday we went [patient and wife]. Today we did it in the gym because it was too cold outside (F2).

Discussion

The results showed data from the population of patients, family members and professionals of a high complexity institution. However future studies may include other subjects and scenarios of care with revascularized cardiac patients.

The family represents the most important support network used by its members in cases of illness and hospitalization. It is considered the first instance of health assistance, a producer of care actions and whose relationships constitute strategies for coping with the disease process. (7)

Through education in health, the professionals, when involved with patients and family, may favor
changes in lifestyle and the exercise of autonomy in self-care by the patient after hospital discharge. In this sense the presence of family is valued by health professionals during perioperative orientation. Therefore, it is possible for the family to understand the coronary cardiac disease and the surgical process and consequently help the patients in coping with all that is necessary.

After hospital discharge, even with an increase in care and family cooperation aiming to favor the recovery of the patient, situations of family conflict may happen and affect the course of treatment and recovery of the revascularized patient. The return to family routine can lead to family and patient anxiety and fear of dealing with the new situation, away from the cares of the healthcare team. The family member, in exercising the role of a caregiver outside the hospital environment, can assume an inflexible behavior and impose very strict rules, increasing the resistance or noncompliance with treatment by the patient.

According to another study, the family relationships kept within their home settings have positive effects in the health of its members, as the characteristics of this context are directly associated with the self-care behavior that the patient has. This statement reinforces the need for interaction and partnership between health professionals and family members to the success of treatment, recovery and rehabilitation of the cardiac patient.

Besides the family support network, patients have spiritual resources as a source of security, faith and hope. Faith is considered important to the patient in coping with the cardiac disease and in the search for quality of life, and prayer is related to fewer complications in the postoperative period of cardiac surgery, as well as bringing positive results to health through belief.

The health professional, particularly in the nursing area, due to maintaining a closer contact with patients during hospitalization, has to be alert, appreciate and stimulate the spiritual resources in order to promote the psychic wellbeing of the patient and ensure a less traumatic experience.

Regarding the initiation of patients in cardiac rehabilitation when they are still hospitalized, the advantages of participating of this service are explained to patients and families by health professionals, considering the importance of an early start of physical activities. The cardiac rehabilitation program aims a quick return to the productive and active life of the patient, in the same way that the introduction of educational moments is important in the patient’s preparation since the preoperative period.

Besides the physical reconditioning, the cardiac rehabilitation program performed at the institution of data collection or in other spaces broadens the possibilities of socialization, interaction and exchange of experiences among patients in order to avoid anxiety and prevent depression. Evidences confirm this finding when it is verified that rehabilitation exercises based on specific and individualized recommendations have a positive effect on the mental health of revascularized patients, in accordance with the prognosis of depression during the postsurgical period of these subjects.

The actions of education in health should start at the hospital but the services of primary healthcare have to continue this practice. It is necessary to reinforce the importance of rehabilitation to the patient and encourage him in the practice of self-care. Studies affirm the need for patients in the cardiac postoperative period to be monitored by a primary healthcare team and these professionals should be able to assess their recovery.

Thus, it is appropriate that health professionals of the hospitals work together with the healthcare teams of primary care service in the sense that they use the system of reference and counter-reference for patients in process of recovery from myocardial revascularization surgery.

**Conclusion**

The main strategies used by patients to cope with coronary cardiac disease and the process of myocardial revascularization are based on the presence and support of the family, the quality of interfamily relationships, the use of spiritual resources and participation in rehabilitation programs that in addition to physical fitness, enable social interactions.
It appears that the experience of cardiac surgery modifies the process of living of the cardiac patient, while the coping strategies used in this process make the experience less traumatic and provide theoretical basis for the nursing care.

Collaborations
Koerich C; Baggio MA; Lanzoni GMM and Higashi GDC declare to have contributed with the conception and design, analysis and interpretation of data; drafting and writing the article, critical review of the intellectual content. Erdmann AL contributed with the final approval of the version to be published.

References
Chronic low back pain: pain intensity, disability and quality of life
Dor lombar crônica: intensidade de dor, incapacidade e qualidade de vida

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Adriano Marinovic²
Priscilla Hortense¹

Abstract
Objective: To assess perceived pain, disability and quality of life in individuals with chronic low back pain.
Methods: Cross-sectional study. An 11-point numerical scale was used to measure pain intensity, the Roland-Morris questionnaire for disability and the WHOQOL-Bref to measure quality of life. Exploratory analysis and Spearman’s correlation coefficient were applied and linear regression models were adjusted.
Results: In the sample of 97 participants, the mean disability score was 14.4; mean pain intensity score at the moment of the interview 5.4; and mean quality of life score 48.1 points. The physical quality of life domain was the most impaired, with a score of 44.1 points.
Conclusion: The perceived pain intensity was considered high, the disability level found was considered severe and the physical quality of life domain appeared as the most impaired and strongly associated with the disability level.

Keywords
Low back pain; Pain measurement; Nursing assessment; Advanced practice nursing; Nursing evaluation research

Resumo
Objetivo: Avaliar a percepção da dor, a incapacidade e qualidade de vida em indivíduos com dor lombar crônica.
Métodos: Estudo transversal. Utilizou-se uma escala numérica de 11 pontos para mensurar a intensidade de dor, o questionário de Roland-Morris para incapacidade e WHOQOL-Bref para mensurar a qualidade de vida. Realizou-se análise exploratória, coeficiente de correlação de Spearman e ajustados modelos de regressão linear.
Resultados: Amostra de 97 participantes, sendo que a média da incapacidade foi 14,4; da intensidade de dor no momento da entrevista, 5,4; e da qualidade de vida 48,1 pontos. O domínio físico da qualidade de vida foi o mais prejudicado, com 44,1 pontos.
Conclusão: A dor percebida foi considerada de alta intensidade, o nível de incapacidade encontrado foi considerado grave e o domínio físico da qualidade de vida o mais prejudicado e fortemente associado ao nível de incapacidade.

Keywords
Low back pain; Pain measurement; Nursing assessment; Advanced practice nursing; Nursing evaluation research

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Introduction

Chronic pain can reduce people’s quality of life (QoL) due to suffering, failed treatments, medication dependence, social isolation, difficulties at work and emotional distress. In addition, it limits professional and leisure activities and decreases patients’ functional ability. It can also cause irritation, sleep disorders, reduced appetite and severe physiological, psychological and social consequences.\(^{(1,2)}\)

Chronic low back pain is a highly prevalent and costly musculoskeletal problem in economically advanced societies nowadays. It can cause long-term disability, absenteeism from work and frequent health service use.\(^{(3-5)}\)

Therefore, low back pain is considered a public health problem of clinical, social and economic importance, which affects the population without distinctions\(^{(6)}\) and requires effective management. Adequate management of pain experiences is only possible if this subjective phenomenon and directly related factors are assessed and measured.

Pain measurement and assessment represent a great challenge to people aiming for appropriate control. Pain is considered a complex, multidimensional, individual and subjective perceptive experience that can only be quantified indirectly.\(^{(7)}\) Patients’ pain complaints should be valued, offering humanized care. Pain should be assessed together with the measurement of vital signs so as to relieve these patients’ suffering and guarantee their rights.\(^{(8)}\)

In this context, the assessment of pain intensity, quality of life and any physical disability pain brings about permits further knowledge on chronic low back pain patients. Hence, measuring these variables can contribute to direct treatment, through the monitoring of pain conditions and the assessment of care outcomes. Therefore, the aim in this research was to assess perceived pain in chronic low back pain patients and compare it with quality of life and physical disability levels.

Methods

A cross-sectional study was developed. A convenience sample of chronic low back pain patients was constituted. Data were collected between February 2010 and August 2011, at a pain clinic in a city in São Paulo State, where care is delivered through the public health system (SUS), health insurances and privately. The inclusion criteria were: medical diagnosis of specific or non-specific Chronic Low Back Pain and individuals over 18 years of age. The exclusion criteria were: cancer-related pain and difficulties to understand the requested tasks.

A numerical 11-point scale was used to collect data on pain intensity; the category estimation method was applied. The numerical scale is an ordinal scale ranging from zero to ten points, in which “zero” means absence of pain and “ten” means unbearable pain. Intermediary pain scores are used to indicate intermediary pain intensities. The participants scored perceived pain at the moment of the interview, the strongest perceived pain intensity in the last week and the weakest perceived pain intensity in the last week.

The Roland-Morris questionnaire is a specific instrument, used for disability assessment in low back pain patients, and has been adapted and validated for the Brazilian culture. This questionnaire consists of 24 items related to activities of daily living. Its score is calculated by adding up all questions marked, ranging between zero and 24, in which zero corresponds to the absence of disability and 24 to severe disability.\(^{(9)}\)

For quality of life assessment purposes, the short version of the WHOQOL-100 was used, an instrument constructed by the World Health Organization and validated for Portuguese – the WHOQOL-bref. This tool consists of 26 questions and covers one general and four specific domains (physical, psychological, social relations and environment).\(^{(10)}\) Quality of life scores in the WHOQOL-bref domains range between zero and 100. The higher the score in each domain, the better the quality of life will be.

For data analysis, descriptive statistics were used, starting with exploratory data analysis. Spearman’s correlation coefficient was applied to establish the correlation between the variables of interest. Linear regression models were adjusted, using PROC REG in the software SAS 9.1 to calculate the association...
among pain intensity, quality of life and disability. For each response variable, simple models (only one independent variable) were adjusted, resulting in an $R^2$ index. Then, multiple models were adjusted, containing more than one independent variable, resulting in adjusted $R^2$ indices. The control variables used were age, gender, BMI, time of diagnosis, education, income and smoking. For statistical data analysis, the software SAS version 9.1 was applied.

In the development of this study, Brazilian and international standards for research involving human beings were complied with.

**Results**

The convenience sample consisted of 97 individuals. The sample number for family income is lower as some participants refused to answer that question. Predominant characteristics were as follows: female gender (69.0%) and mean age of 54.2 years; 38.1% of the sample were people aged 60 years or older. As regards the education level, 41.24% of the sample indicated up to eight years education. Concerning family income, the study revealed that 70.53% received between two and eight monthly minimum wages. As for BMI, 73.20% suffered from overweight or obesity, 32.98% of whom revealed some degree of obesity in accordance with the WHO (World Health Organization) classification.(11) Approximately 80% of the sample were non-smokers and the mean time of diagnosis of the chronic low back pain was 77.4 months (Table 1).

The mean score on the Roland-Morris disability questionnaire was 14.4 points, with 58.76% of the sample scoring higher than 14 points. As regards perceived pain, the mean strongest pain score in the last week was eight points, with 73.19% of the sample scoring higher than eight. The mean lowest pain score in the last week was 4.2 points and the mean pain score at the moment of the interview 5.4 points. The general mean QoL score was 48.1 points, in which the physical domain appeared as the most impaired, with 44.1 points (Table 2).

<table>
<thead>
<tr>
<th>Variáveis</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>67(69.07)</td>
</tr>
<tr>
<td>Male</td>
<td>30(30.93)</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
</tr>
<tr>
<td>20 to 29 years</td>
<td>4(4.12)</td>
</tr>
<tr>
<td>30 to 39 years</td>
<td>11(11.34)</td>
</tr>
<tr>
<td>40 to 49 years</td>
<td>26(26.80)</td>
</tr>
<tr>
<td>50 to 59 years</td>
<td>19(19.58)</td>
</tr>
<tr>
<td>&gt; 60 years</td>
<td>37(38.14)</td>
</tr>
<tr>
<td><strong>Mean (SD) min-max</strong></td>
<td>54.2(14.5)22-84</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>2(2.06)</td>
</tr>
<tr>
<td>Up to 8 years</td>
<td>40(41.24)</td>
</tr>
<tr>
<td>9 to 12 years</td>
<td>32(32.99)</td>
</tr>
<tr>
<td>More than 12 years</td>
<td>23(23.71)</td>
</tr>
<tr>
<td><strong>Family income</strong></td>
<td></td>
</tr>
<tr>
<td>Up to 2 MW</td>
<td>11(11.58)</td>
</tr>
<tr>
<td>2 to 8 MW</td>
<td>67(70.53)</td>
</tr>
<tr>
<td>More than 8 MW</td>
<td>17(17.89)</td>
</tr>
<tr>
<td><strong>Body Mass Index</strong></td>
<td></td>
</tr>
<tr>
<td>&lt;18.5</td>
<td>1(1.03)</td>
</tr>
<tr>
<td>18.5 to 24.9</td>
<td>25(25.77)</td>
</tr>
<tr>
<td>25 a 29.9</td>
<td>39(40.20)</td>
</tr>
<tr>
<td>&gt;30</td>
<td>32(32.98)</td>
</tr>
<tr>
<td><strong>Smoking</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19(19.59)</td>
</tr>
<tr>
<td>No</td>
<td>78(80.41)</td>
</tr>
<tr>
<td><strong>Time of diagnosis</strong></td>
<td></td>
</tr>
<tr>
<td>Mean (SD)</td>
<td>77.4(85.10)</td>
</tr>
</tbody>
</table>

Legend: Gender n=97; Age n=97; Education n=97; Family Income n=95; Body mass index n=97; Smoking n=97; Time of diagnosis n=97

Associations between the three moments of pain intensity and disability revealed weak to moderate positive correlations (strongest pain $r=.22$ $p=.03$, weakest pain $r=.45$ $p<.01$, pain at the moment of the interview $r=.35$; $p<.01$). Regression analysis showed that stronger pain intensity, in combination with the control variables, explains 19% of variability in disability levels. Only pain intensity is responsible for 4% of this relation, as a strong interaction factor with the control variables. Among these, gender (coefficient=4.5 and $p=.00$) is the variable that most strongly influences this relation,
demonstrating higher disability scores among men than women.

**Table 2.** Pain intensity, disability level and quality of life domains

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain intensity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stronger pain in last week</td>
<td>8.0</td>
<td>8.0</td>
<td>2.3</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Weaker pain in last week</td>
<td>4.2</td>
<td>4.0</td>
<td>2.5</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Pain at the moment of the interview</td>
<td>5.4</td>
<td>6.0</td>
<td>2.9</td>
<td>0.0</td>
<td>10.0</td>
</tr>
<tr>
<td>Disability</td>
<td>14.4</td>
<td>16.0</td>
<td>6.0</td>
<td>1.0</td>
<td>24.0</td>
</tr>
<tr>
<td>Quality of life</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical domain</td>
<td>44.1</td>
<td>46.4</td>
<td>21.0</td>
<td>3.6</td>
<td>96.4</td>
</tr>
<tr>
<td>Psychological domain</td>
<td>61.4</td>
<td>62.5</td>
<td>18.0</td>
<td>20.8</td>
<td>100.0</td>
</tr>
<tr>
<td>Social relations domain</td>
<td>65.6</td>
<td>66.7</td>
<td>18.7</td>
<td>16.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Environment domain</td>
<td>62.0</td>
<td>62.5</td>
<td>15.5</td>
<td>28.1</td>
<td>100.0</td>
</tr>
<tr>
<td>General domain</td>
<td>48.1</td>
<td>50.0</td>
<td>24.2</td>
<td>0.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Associations between the three moments of pain intensity and QoL showed weak negative correlations with the physical domain of quality of life (strongest pain \(r=-.29\) \(p<.01\), weakest pain \(r=-.38\) \(p<.01\), pain at the moment of the interview \(r=-.28;\) \(p<.01\)). Regression analysis revealed that greater pain intensity, in combination with control variables, explains 15% of variability in the physical domain. Only pain intensity is responsible for 8% of this relation, as an interaction factor with the control variables. Among these, gender (coefficient=-11.26 and \(p=.02\)) appears as the variable that most strongly influences this relation, demonstrating that women score higher in the physical domain than men. The associations with other QoL domains showed no evidence of any relation with pain intensity.

Associations between disability and QoL domains revealed a strong negative correlation with the physical domain \((r=-.77, p<.01)\) and a moderate negative correlation with the psychological domain \((r=-.45, p<.01)\). Regression analysis revealed that disability combined with the control variables, explains 65% of variability in the physical QoL domain. Only disability is responsible for 61% of this relation, showing a low interaction factor with the control variables, among which age \((p=.01)\) appears as the variable that most strongly influences this relation. Thus, the physical QoL domain reveals to be the most strongly related with disability levels when compared to other domains. Complete data are displayed in table 3. Associations between disability and other QoL domains provide limited evidence.

**Discussion**

Study limitations include the lack of non-probabilistic sampling and of a control group for comparison. In this study, the perceived pain of chronic low back pain patients was assessed and compared with quality of life and physical disability levels. This permits knowledge on the relations between the attributes under analysis, highlighting how important it is for nurses to appropriately assess patients in pain and to take into account all attributes related to this phenomenon.

The mean disability level observed in this sample with the help of the Roland-Morris questionnaire was 14.4 points, which represents severe disability\(^{(12)}\), in accordance with a research developed in the USA\(^{(13)}\) in other studies, moderate disability levels were found\(^{(14-16)}\). In a study undertaken in Slovenia, approximately 50% of the chronic low back pain sample presents moderate to severe disability\(^{(17)}\). The degree of disability found in this study is underlined, showing the extent to which chronic low back pain patients cannot perform daily activities normally.

The higher pain measured in the last week revealed a mean score of 8.0 points. In another study, it was observed that, when asked about this parameter, 42% of the interviewees demonstrated strong low back pain in the last week, scored between seven and ten, on a scale from zero to ten\(^{(18)}\). The weakness of categorical pain measurement scales is highlighted; first, because the number of categories through which the
Table 3. Disability x quality of life domains

<table>
<thead>
<tr>
<th>Domains</th>
<th>Parameter</th>
<th>Coefficients</th>
<th>p-value</th>
<th>R2</th>
<th>Adjusted R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td>Intercept</td>
<td>79.58</td>
<td>&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disability</td>
<td>-2.81</td>
<td>&lt; 0.01</td>
<td>0.61</td>
<td>0.65</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>1.28</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Age</td>
<td>0.28</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>BMI</td>
<td>-0.21</td>
<td>0.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education</td>
<td>3.60</td>
<td>0.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Income</td>
<td>-4.00</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smoking</td>
<td>-5.63</td>
<td>0.10</td>
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</tr>
<tr>
<td></td>
<td>Time of diagnosis</td>
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<td>0.16</td>
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<tr>
<td>Psychological</td>
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<td>&lt; 0.01</td>
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<tr>
<td></td>
<td>Disability</td>
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<td>&lt; 0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
<td>Age</td>
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<td></td>
<td>BMI</td>
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<tr>
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<td>0.26</td>
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<tr>
<td></td>
<td>Age</td>
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<td></td>
<td>BMI</td>
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<td></td>
<td>Smoking</td>
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<td></td>
<td>Time of diagnosis</td>
<td>-0.02</td>
<td>0.55</td>
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</tr>
<tr>
<td>Environment</td>
<td>Intercept</td>
<td>50.65</td>
<td>&lt;0.01</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
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<td>-0.81</td>
<td>&lt;0.01</td>
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</tr>
<tr>
<td></td>
<td>Gender</td>
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<td></td>
<td>Age</td>
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<td>0.02</td>
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<td></td>
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<td></td>
<td>BMI</td>
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<td>0.34</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Education</td>
<td>1.30</td>
<td>0.57</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Income</td>
<td>-0.99</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smoking</td>
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<td>0.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Time of diagnosis</td>
<td>-0.01</td>
<td>0.68</td>
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</tbody>
</table>
stimuli are judged is fixed; second, because the method introduces severe bias when considering the range of the categories and the constraint caused to the interviewee by imposing an anchor (upper limit) at the end of the pain continuum.\(^7\) Therefore, the need for further research is emphasized to understand the quality of perceived pain through characteristic descriptors.

The most affected QoL domain found in this study was the physical, in accordance with other studies.\(^{13,14,19,20}\) The physical QoL domain comprises questions related to pain, discomfort, energy, fatigue, sleep and rest, revealing the extent to which these factors are negatively influenced in chronic low back pain patients.

In this study, a weak association was found between pain intensity and disability and QoL, indicating that pain intensity is weakly related to the degree of disability and QoL. This relation needs to be better understood in future research, with a view to furthering knowledge about what factors are more strongly associated with disability. Also, other related attributes need to be investigated, including self-efficacy beliefs, catastrophizing and depression. This understanding permits knowledge about the phenomena involved in the chronic pain phenomenon, so as to guide its management.

A strong association was observed between disability and the physical domain of QoL, in accordance with studies in Slovenia\(^{17}\) and the Netherlands.\(^{20}\) In a study undertaken in Sweden, on the other hand, a moderate association between these variables was found.\(^{14}\) Thus, the physical domain of QoL seems to be the most strongly related with the disability level, indicating that high levels of disability could bring about a worse QoL.

Chronic back pain can cause greater disability and a worse quality of life, especially in patients with somatic-mental comorbidities, in female patients and in patients with high levels of chronic pain. Health professionals need to focus on an active search for depression and anxiety signs and for better pain management in chronic low back pain patients, particularly in case of somatic comorbidities. This can lead to an important reduction in disability levels and improve quality of life, as expected for the appropriate management of these patients.\(^{17}\)

**Conclusion**

High pain intensity, severe disability and great impairment in the physical domain of quality of life were perceived. A strong association was observed between disability and the physical quality of life domain, indicating that disability negatively affects and strongly influences physical quality of life in these patients with chronic low back pain.

**Acknowledgements**

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**Collaboration**

Stefane T; Santos AM; Marinovic A and Hortense P declare that they contributed to the conception and project, data analysis and interpretation; writing of the paper, relevant critical review of the intellectual contents and final approval of the published version.

**References**


Comprehension of undergraduate students in nursing and medicine on patient safety

Compreensão de alunos de cursos de graduação em enfermagem e medicina sobre segurança do paciente

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Ariane Ferreira Machado Avelar¹

Keywords
Education; Patient safety; Nursing; Students, nursing, Students, medical

Descritores
Educação; Segurança do paciente; Enfermagem; Estudantes de enfermagem; Estudantes de medicina

Abstract
Objective: Identify the understanding of graduate students in nursing and medicine at a public university in São Paulo on human error and patient safety.

Methods: Prospective and exploratory study in which were investigated variables related with the characterization of students and attitudinal and conceptual aspects about the theme. The sample consisted of 109 students who responded to a research electronic form.

Results: Most students received formal training on the subject and had attitudes that demonstrated uncertainty in what would be correct for some practices.

Conclusion: Students demonstrated being able to relate some of the aspects surveyed about patient safety with the experience they had during internship programs.

Keywords

Resumo
Objetivo: Identificar a compreensão de alunos de graduação em enfermagem e medicina de uma universidade pública do Município de São Paulo sobre erro humano e segurança do paciente.

Métodos: Estudo prospectivo e exploratório no qual foram investigadas variáveis relativas à caracterização dos alunos e aos aspectos atitudinais e conceituais sobre o tema. A amostra constituiu-se de 109 alunos que responderam ao formulário eletrônico.

Resultados: A maior parte dos alunos obteve aprendizado formal sobre esse tema e apresentou atitudes que demonstraram incerteza no que seria correto em relação a algumas práticas.

Conclusão: Os alunos demonstraram serem capazes de relacionar alguns dos aspectos pesquisados sobre segurança do paciente com a experiência vivida nos estágios curriculares.

Keywords

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Conflicts of interest: no conflicts of interest to declare.
Introduction

Human error and patient safety in the health system have been the themes of several studies, among which stands out the publication of the Institute of Medicine (IOM) from the United States, showing that the number of deaths due to errors during healthcare is greater than those related to automobile accidents, breast cancer and Acquired Immune Deficiency Syndrome combined. It estimates that in the US 98 thousand people die every year due to failures in healthcare assistance.\(^{(1)}\)

In several aspects in healthcare, human error can happen due to isolated factors or due to multiple factors associated whether inherent to the patient himself, of institutional and financial order and also of structural resources such as architectural design, materials or equipment, as well as, lack of knowledge and skills.\(^{(2)}\) The first step for understanding and preventing human error is to know the possibility of its occurrence, besides the types, causes and consequences.\(^{(3)}\)

The academic education of healthcare professionals whether in the universities or in technical courses reinforces the premise of the development of work without errors, generating the culture that they are totally unacceptable and related only to the lack of care, attention, effort, responsibility and knowledge, which contributes decisively with the occurrence of errors.\(^{(4)}\)

Many times during their training, healthcare professionals are not introduced to the topic of patient safety, generating situations of crisis both in the universities and in healthcare settings, challenging education institutions in search of a new conceptual standard for the practice and teaching of these professionals.\(^{(2,5,6)}\) In medical schools, teaching is totally focused on the diagnosis and management of the disease, thus having little attention dedicated to patient safety and a system of error analysis.\(^{(7)}\)

For a change to occur in the safety culture of healthcare institutions, new professionals have to show knowledge and skills to identify and realize what do when they witness or commit an error. Undergraduate courses in the health field may play an important role in the promotion of concepts and skills about human error and patient safety for its students. Studies show that, when introduced to this theme, students demonstrate motivation and recognize the relevance of the subject for their training, besides being identified a high impact on the assistance provided to patients.\(^{(8,9)}\)

Thus, the objective of the study was to identify the comprehension of undergraduate students in nursing and medicine at a public university of São Paulo on human error and patient safety.

Methods

A prospective exploratory research in which the term ‘comprehension’ was used to include the meaning of understanding concepts related to patient safety, as well as its expression in attitudes observed and experienced in academic learning scenarios.

The population of the study was composed of undergraduate students in nursing of the third and fourth year and undergraduate students in medicine of the fourth and fifth year at the Federal University of São Paulo. The choice of the years was due to the fact that in the periods selected, students had already had contact with patients because of the compulsory internship program.

The data collection instrument was composed of variables related to the characterization of students (gender, age, course, year, experience in healthcare and formal learning about patient safety), and assertions concerning attitudinal and conceptual aspects on human error and patient safety. Such variables were measured through scales of the Likert type.

For the analysis of the proposed questionnaire and assessment of the assertions’ understanding, the Delphi technique was used by a group of three experts on patient safety. It was established as concordance if two or more raters responded “agree” for the assertion and disagreement if two or more raters evaluated the assertions with “neither agree nor disagree” or “disagree”, in these cases it was re-
quested a suggestion for change. After two rounds of the Delphi technique abovementioned, the instrument was deemed suitable for application. The initial draft of the questionnaire was created based in the researcher's expertise in the theme and literature of the area.\textsuperscript{(9)}

Data collection occurred between April fourth and May fourth, 2011, after the agreement of the coordination of the undergraduate courses and approval of the research project by the Research Ethics Committee of the selected university, being conducted with the inclusion of the questionnaire in the program \textit{LimeSurvey}, which consists of a tool for the creation and application of questionnaires on web platform through an interface that is of easy and intuitive administration and provides higher security for information and the access of respondents. After the inclusion of the questionnaires in the specified program, the instrument was sent to research participants who agreed to participate providing their electronic mail. The data collected were submitted to a descriptive and statistical analysis and the categorical variables were analyzed according to absolute and relative frequency.

The study complied with national and international ethical standards in research involving humans.

\textbf{Results}

Among the 417 students enrolled in nursing and medicine in the grades (years) investigated in 2011, 399 (95.7\%) provided their email address. Among these, the sample of the study comprised 109 (27.3\%) students who replied to the electronic form that contained the study variables during the period of data collection, being 23 (21.1\%) of the third year and 52 (47.7\%) of the fourth year in nursing, and 24 (22.0\%) of the fourth year and 10 (9.2\%) of the fifth year in medicine.

Regarding the variables of characterization of students, the majority of respondents was female, aged between 19 and 34 years old and had already obtained formal learning on patient safety. A minority (10.1\%) already worked in the health field, mostly developing activities in the area of care (81.8\%) (Table 1).

The group of students of the two courses strongly agreed that in the presence of an error all the involved should discuss its occurrence (70; 64.2\%). They agreed or strongly agreed that, for the analysis of human error it is important to know what are the individual characteristics of the professional who made the mistake (70; 64.2\%), that after an error occurs, an effective prevention strategy is to work more carefully (85; 78.0\%), that professionals should not tolerate working in places that do not offer suitable conditions for work (91; 83.5\%), that to implement preventive measures a systemic analysis of the facts should always be established (101; 92.7\%) and that preventive measures should be adopted whenever someone is injured (93; 85.3\%) (Table 2).

Regarding the attitudinal aspects, in the occurrence of errors the majority of the respondents (95; 87.2\%) communicate the professors about the presence of conditions that can lead to the occurrence of errors in the training settings and notify the professor, manager or person in charge of the training site (81; 74.3\%) and the colleagues when an error occurs (82; 75.2\%), however many agree (43; 39.4\%) and many disagree (37; 33.9\%) with the attitude of communicating the error occurrence to the patient and family, and if there is no damage to the patient the answers show no consensus on the agreement (38; 34.8\%) nor on the disagreement (52; 47.7\%) of reporting the error to the patient and family in the same way as the adoption of corrective measures by the professors so that students do not make new mistakes.

Most students disagreed or strongly disagreed (100; 91.7\%) that systems to report errors make little difference in reducing future errors, that only doctors can determine the cause of the occurrence of errors (102; 93.6\%), that they (students) always perform internship activities in locations that promote good practices (79; 72.5\%) and that whenever they identify situations that require improvements, they get the support of the institution for implementing safety measures (68; 62.4\%).
Table 1. Conceptual aspects related to human error and patient safety, according to the comprehension of undergraduate students in nursing and medicine

<table>
<thead>
<tr>
<th>Conceptual aspects</th>
<th>SA (N)</th>
<th>A (N)</th>
<th>NO (N)</th>
<th>D (N)</th>
<th>SD (N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Making mistakes in healthcare is inevitable.</td>
<td>2 (2.6)</td>
<td>6 (17.7)</td>
<td>23 (30.6)</td>
<td>4 (5.3)</td>
<td>29 (38.9)</td>
</tr>
<tr>
<td>There is a big difference between what the professionals know, what is right and what is seen in day-to-day healthcare.</td>
<td>33 (44.0)</td>
<td>9 (26.5)</td>
<td>37 (49.5)</td>
<td>2 (2.6)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>Competent professionals do not make errors that harm the patients.</td>
<td>5 (6.6)</td>
<td>-</td>
<td>12 (16.0)</td>
<td>3 (4.0)</td>
<td>43 (57.4)</td>
</tr>
<tr>
<td>Committed students do not make mistakes that harm the patients.</td>
<td>3 (4.0)</td>
<td>-</td>
<td>11 (14.6)</td>
<td>3 (4.0)</td>
<td>45 (60.1)</td>
</tr>
<tr>
<td>In the presence of an error, all the involved (professionals, students, managers, patient and family) should discuss its occurrence.</td>
<td>46 (61.5)</td>
<td>24 (70.6)</td>
<td>23 (30.6)</td>
<td>4 (5.3)</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>For the analysis of human error it is important to know the individual characteristics of the professional who made the error.</td>
<td>19 (13.3)</td>
<td>2 (5.9)</td>
<td>39 (52.2)</td>
<td>10 (13.3)</td>
<td>14 (18.6)</td>
</tr>
<tr>
<td>After an error occurs, an effective prevention strategy is to work more carefully.</td>
<td>27 (36.0)</td>
<td>13 (38.3)</td>
<td>30 (40.0)</td>
<td>2 (2.6)</td>
<td>15 (20.1)</td>
</tr>
</tbody>
</table>

Legend: A – Agree; SA – Strongly Agree; NO – Neither agree nor disagree (No Opinion); D – Disagree; SD – Strongly Disagree; NG – Nursing Group; MG – Medicine Group
Table 2. Attitudinal aspects related to human error and patient safety, according to the comprehension of undergraduate students in nursing and medicine

<table>
<thead>
<tr>
<th>Attitudinal aspects</th>
<th>A</th>
<th>SA</th>
<th>NO</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
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<tr>
<td></td>
<td>NG</td>
<td>MG</td>
<td>NG</td>
<td>MG</td>
<td>NG</td>
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<tr>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
<td>n (%)</td>
</tr>
<tr>
<td>Professionals should not tolerate working in places that do not offer suitable conditions for patient care.</td>
<td>30 (40.0)</td>
<td>19 (55.9)</td>
<td>33 (44.1)</td>
<td>9 (26.5)</td>
<td>9 (12.0)</td>
</tr>
<tr>
<td>To implement measures of human error prevention, a systemic analysis of the facts should always be established.</td>
<td>42 (56.1)</td>
<td>12 (35.3)</td>
<td>30 (44.0)</td>
<td>17 (50.0)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>It is necessary to implement a systemic analysis of errors in healthcare but preventive measures must be adopted whenever someone is injured.</td>
<td>30 (40.0)</td>
<td>13 (38.2)</td>
<td>31 (41.3)</td>
<td>19 (55.9)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>I always communicate my professor about the presence of conditions in the training settings that can lead to the occurrence of errors.</td>
<td>38 (50.7)</td>
<td>11 (32.4)</td>
<td>33 (44.1)</td>
<td>13 (38.2)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>I always communicate the professor/manager/person in charge of the training site about the occurrence an error.</td>
<td>31 (41.3)</td>
<td>3 (8.0)</td>
<td>32 (42.7)</td>
<td>15 (44.1)</td>
<td>2 (2.6)</td>
</tr>
<tr>
<td>I always communicate my colleague about the occurrence of an error.</td>
<td>26 (34.6)</td>
<td>8 (14.7)</td>
<td>31 (41.3)</td>
<td>17 (50.0)</td>
<td>10 (32.1)</td>
</tr>
<tr>
<td>I always communicate patients and their families about the occurrence of an error.</td>
<td>9 (12.0)</td>
<td>1 (2.9)</td>
<td>27 (36.0)</td>
<td>6 (17.7)</td>
<td>17 (52.6)</td>
</tr>
<tr>
<td>If no damage occurs to the patient, it should be considered whether it is necessary to report the occurrence of the error to the patient and the family.</td>
<td>6 (8.0)</td>
<td>5 (14.7)</td>
<td>18 (24.0)</td>
<td>9 (26.5)</td>
<td>15 (45.1)</td>
</tr>
<tr>
<td>The professors always take corrective measures with the student in order to avoid that he makes new mistakes.</td>
<td>10 (13.3)</td>
<td>2 (5.9)</td>
<td>27 (36.0)</td>
<td>8 (23.5)</td>
<td>11 (33.3)</td>
</tr>
<tr>
<td>Systems to report the occurrence of errors make little difference in reducing future errors.</td>
<td>1 (1.3)</td>
<td>-</td>
<td>2 (2.6)</td>
<td>-</td>
<td>5 (14.7)</td>
</tr>
<tr>
<td>Only doctors can determine the cause of the occurrence of errors.</td>
<td>-</td>
<td>1 (2.9)</td>
<td>-</td>
<td>2 (2.9)</td>
<td>1 (1.3)</td>
</tr>
<tr>
<td>I always perform the internship activities in locations that promote good practices for patient safety.</td>
<td>4 (5.3)</td>
<td>3 (8.8)</td>
<td>9 (12.0)</td>
<td>5 (14.7)</td>
<td>6 (17.7)</td>
</tr>
<tr>
<td>Whenever I identify situations that require improvements I get support from the institution to implement measures that promote safe practices.</td>
<td>1 (1.3)</td>
<td>1 (2.9)</td>
<td>7 (9.3)</td>
<td>1 (2.9)</td>
<td>20 (57.1)</td>
</tr>
</tbody>
</table>

Legend: A – Agree; SA – Strongly Agree; NO – Neither agree nor disagree (No Opinion); D – Disagree; SD – Strongly Disagree; NG – Nursing Group; MG – Medicine Group
Discussion

The publication by IOM “To Err is Human: Building a better health system” and the creation of the World Alliance for Patient Safety by the World Health Organization have contributed to the patient safety issue to be addressed and considered a challenge for the health system, influencing countries and considerably raising the importance of presenting the concepts and principles of this topic in training courses for health professionals.(1)

Knowing that most of the students responded to have already had a formal learning on the subject investigated we can interpret the results obtained based in a more rigorous theoretical reference, since the students are not lay on the topic.

Regarding the conceptual aspects investigated the statement “Making mistakes in healthcare is inevitable” presented higher percentage of discordant responses among the nursing students. On the other hand, most medical students (64.7%) agreed or strongly agreed with the statement. Thus, it was evaluated that the comprehension of the possibilities to prevent the occurrence of errors in healthcare based on the implementation of strategies and barriers that promote patient safety are not yet seen as a reality by both groups.

Medical students identified the real possibility of error occurrence in healthcare as in any other area of human activity, and nursing students believe in the possibility of prevention based in the adoption of measures and changes in the system.

Most students disagreed with the assertions which addressed that competent professionals and students do not make mistakes that harm the patients. These perceptions show that undergraduate students are aware that the error analysis cannot be individual but systemic, and increasingly healthcare is developed in dynamic and specialized environments where complex interactions occur among pathophysiology, diseases, staff, infrastructure, equipments, processes, standards and procedures.

As for prevention, most students agree that after an error occurs, an effective prevention strategy is to work more carefully, which reflects a point of view focused on the individual and not on the culture of safety that includes the system as a whole and not just the wrong act of a professional hence the prevention of errors occurrence is not exclusively related with changes in the behavior of professionals.

In the presence of error the best strategy is that all involved discuss its occurrence in order to determine ways to prevent it. In accordance with the above concept, most students stated to always communicate the colleagues, professor/manager/person in charge of the internship location about the occurrence of errors and in majority disagreed with the assertion “Systems to report occurrence of errors make little difference in reducing future errors” and also in majority disagreed with “Only doctors can determine the cause of the occurrence of errors”. Besides the discussion of the error among the people involved, all professionals, managers and patients should participate because it is a moment in which experiences can be shared to clarify how the error happened and how it could be prevented because it was not imminently resultant of an isolated act of a professional, but of a system designed to generate human errors.

The statement “For the analysis of human error it is important to know the individual characteristics of the professional who made the mistake” showed the highest percentage of concordant answers, reflecting the comprehension of the students on the importance of studying the causes for occurrence of errors. These results reflect a cultural shift of thought in how to deal with errors, since the constructive and supportive approaches promote a learning environment and encourage the reports that are essential to identify and solve the problems that lead to errors.(10)

This cultural shift in the thinking of university students is also demonstrated in the statement “It is necessary to implement systemic analysis of errors in healthcare, but preventive measures need to be taken whenever someone is injured” which had the highest percentage of concordant answers. However, depending on the philosophy of the health institution, the isolated identification of the individual characteristics of the
A professional who made the error will keep the focus on the individual and not on the system which may have faults that contribute with the occurrence of errors, perpetuating the practice of removing the professional with certain features from the work environment, without analyzing the system as a whole.

A study conducted with nurses in an intensive care unit verified that the majority of professionals (74.3%) reports the existence of punishment in the occurrence of adverse events, contradicting the recommendations of a systemic analysis of error and implementation of a culture of safety in health institutions which should evaluate the flaws in the system, and not identify the guilty to be punished.\(^{(1)}\)

In this sense, it is worth noting that the statement “Professors always perform corrective measures with the student so that he will not make new mistakes” showed difference between the responses of students of the two investigated courses, suggesting that the adoption of corrective measures is more common with the professors of the undergraduate course in nursing when compared with the undergraduate course of medicine.

Most students agreed that professionals should not tolerate working in places that do not offer suitable conditions for labor nor perform internship activities in locations that do not support good practices for the promotion of patient safety. This perception explains the fact that the undergraduate students understand that the poor infrastructure of the workplace is responsible for adverse events caused to patients. Likewise, the majority of the students agreed that in order to implement measures to prevent human errors, a systemic analysis of the facts should always be established. This highlights what safety experts affirm, that human beings can fail and that errors show latent faults in the system, including precarious conditions in the workplace, tasks poorly designed, inefficient team work and failures in preventing errors.\(^{(12)}\)

Regarding attitudinal aspects in the presence of errors, the majority of respondents notify the professor about the existence of conditions that can lead to the occurrence of errors in the internship location. The fact of communicating the presence of inappropriate structural conditions in the internship locations shows that students have a good perception of failures in the healthcare system with regard to the occurrence of future errors, however, it is explicit that whenever a situation that needs improvements is identified, students do not have the support of the institution for the implementation of safety measures, what can lead to the reflection that the professionals should correct their mistakes because the system does not change, it just accuses the professionals who are blamed for errors resultant of a system with faults. This shows that in the national health system the errors have been attributed to the individual rather than the system, being necessary a change of the reality experienced in order to ensure the quality of care provided to the population.\(^{(13)}\)

The majority of students disagreed with the assertion which states that every time they identify situations that need improvements, students receive support from the institution to implement measures that promote safe practices. According to the primary data of the research, among these 68 students, 49 (72.1%) were undergraduate students in nursing. These prospective nurses should work in an environment that has infrastructure, professionals in adequate quantity and with appropriate qualification for a professional of this kind, being able to perform nursing practices in a broad and solid way, based on evidences and to continuously seek new evidences capable of changing the results identified nowadays related to patient safety. Among all the professions in health, nursing is the most capable of promoting practices focused on protection due to its stability and proximity with patients and family.\(^{(14)}\)

It is identified a doubt of the students in relation to the attitude of reporting the occurrence of errors to the patients and their families especially when there is no harm to the patient. It is known by students that one of the main responsibilities of health professionals, when an error
Comprehension of undergraduate students in nursing and medicine on patient safety

occurs is to inform the patient. The patients and their families have the right to know the truth and this information is essential to maintain their confidence in the work of the team. However, a study on medication errors in hospitalized children in a pediatric intensive care unit for treatment of cancer patients identified that 95.5% of the patients victims of errors and their families were not notified of its occurrence by the health team.

The fact that 100 students (91.6%) agree that there is a great difference between what professionals know, what is right and what is seen in daily healthcare explains the fact that the consistent interconnection between theory and practice is not something experienced in Brazilian health institutions. More trained health professionals producing better outcomes in patient care, increasing satisfaction and confidence of the user with the system of assistance, but above all, reducing morbidity and mortality, as evidenced in large studies conducted abroad, are not yet a reality seen by students, what could also difficult the assimilation of theoretical contents presented by the lack of correlation with practice.

The awareness of doctors and nurses that errors are inevitable companions of the human condition, even in conscious and qualified professionals, is perhaps the first and most important step for the beginning of necessary changes. Errors must be accepted as evidences of a system failure and viewed as an opportunity to review the system and improve the care provided to patients. Hence the importance of assessing the perception and knowledge of undergraduate students in nursing and medicine in the sphere of patient safety because they will be the future professionals working in healthcare to the population.

Conclusion

The students demonstrated to be able to relate some of the aspects surveyed on the topic of patient safety with the experience during their internship programs.

Acknowledgements

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Collaborations

Yoshikawa JM; Sousa BEC; Peterlini MAS and Kusahara DM declare to have contributed with drafting the article, relevant critical review of intellectual content and final approval of the version to be published. Pedreira MLG and Avelar AFM collaborated with the stages of study conception, analysis, interpreting data, drafting the article, relevant critical review of intellectual content and final approval of the version to be published.

References

12. Sorokin R, Riggio JM, Hwang C. Attitudes about patient safety: a


Agreement between nurses regarding patients’ risk for developing pressure ulcer

Concordância entre enfermeiros quanto ao risco dos pacientes para úlcera por pressão

Carla Maria Fonseca Simão¹
Maria Helena Larcher Caliri²
Claudia Benedita dos Santos²

Abstract

Objectives: To evaluate the agreement between nurses regarding classification and assessment of patients’ risk for developing pressure ulcer.

Methods: A descriptive exploratory study conducted with 22 nurses in four intensive care units of Brazilian university hospitals. The Braden Scale was used for assessment and classification of the patients’ risk for developing pressure ulcer. To assess agreement, we considered the score obtained by the researcher, nurse specialist, as gold standard parameter for comparison with scores punctuated by assisting nurses.

Results: There was general agreement among nurses only in the assessment of the subscales Sensory Perception, Mobility, Friction & Shear. For classification into risk levels, there was agreement in only two units.

Conclusion: There were differences of agreement between assisting nurses and difference in classification of patients into risk levels.

Keywords
Pressure ulcer; Risk assessment; Nursing care; Intensive care units

Resumo

Objetivos: Avaliar a concordância entre enfermeiros quanto à avaliação e classificação de risco dos pacientes para desenvolvimento da Ulcera por Pressão.

Métodos: Estudo descritivo exploratório realizado com 22 enfermeiros assistenciais em quatro Unidades de Terapia Intensiva de hospital universitário brasileiro. Utilizou-se a escala de Braden para avaliação e classificação do risco dos pacientes para Úlcera por Pressão. Para avaliação da concordância, considerou-se o escore obtido pela pesquisadora, enfermeira especialista, como parâmetro ouro para comparação com os escores pontuados pelos enfermeiros assistenciais.

Resultados: Verificou-se concordância geral entre os enfermeiros somente na avaliação das subescalas Percepção Sensorial, Mobilidade, Fricção e Cisalhamento. Quanto à classificação em níveis de risco, houve concordância apenas em duas Unidades.

Conclusão: Foram encontradas divergências de concordância entre os enfermeiros assistenciais e diferença na classificação dos pacientes em níveis de risco.

Conflict of interest: No conflicts of interest to declare.
Introduction

The prevention of pressure ulcers (PU) is considered an important issue regarding the global movement context for patient safety. It may cause harm of diverse natures to individuals and health services. The PU is also considered one of the negative indicators of healthcare quality of nursing and health services.\(^{(1,2)}\)

The risk assessment for the development of the PU and the use of appropriate preventive measures are recommended by international guidelines and cited by the authors as “best practices”. Therefore, it can lead to reduce incidence, improve the quality of nursing care and therefore greater safety for patients, especially those admitted to intensive care units.\(^{(3-6)}\)

One of the most used scales to help identify the risk of developing PU is the Braden Scale. The total score ranges from 6 to 23, the scores 19-23 indicate patients without risk, 15-18 mild risk, 13-14 moderate risk, 10 to 12 high risk and score ≤ nine indicates very high risk patients.\(^{(6,7)}\)

The purpose of the scale is to assist nurses in clinical care to predict whether a patient will develop pressure ulcers and point out risk factors in evidence. From this, the purpose is to plan effective and individualized strategies for prevention based on the risk factors found in patients through the instrument. In order for the scale of risk assessment to reach PU proposal, it is important that nurses know how to use the instrument and there is measure agreement among those who use it.\(^{(6,7)}\) A high correlation indicates a high level of agreement between evaluators, a necessary condition to obtain valid scores.\(^{(8)}\)

In Brazil, as in other countries, currently, the issue of agreement and reliability of the scale scores and subscale scores of the risk assessment, obtained by different nurses, is important for health care organizations, because it allows the proper classification of PU risk patients to the correct calculation of the incidence of ulcers and improvement of nursing care through the establishment of prevention protocols according to the risk level of the patient.\(^{(1,4,7,9-11)}\)

Considering these questions, this study was planned from the situation experienced in a Brazilian university teaching hospital, inserted in the Hospital Quality Commitment Program (HQCP), where the assisting nurses as part of the strategy for Risk Management, use routinely Braden Scale for risk assessment of patients and to monitor the incidence of PU, as well as the prescription of preventive measures.

In this approach, the study aimed to evaluate the correlation between the assisting nurses regarding the assessment and classification of pressure ulcer risk in patients hospitalized in Intensive Care Units.

Methods

It is a descriptive exploratory study with quantitative analysis conducted at the Base Hospital in São José do Rio Preto, Brazil. The study was conducted in four intensive care units (ICUs) in the month of October 2009.

It was adopted as inclusion criteria: nurses who were scheduled and working in ICUs on any shift during the entire period of data collection. The study included 22 nurses, three from Emergency ICU, seven from the General ICU, six from the health insurance coverage ICU and six from Coronary ICU.

We selected 72 patients to assess the risk for developing PU. The selection criterion was the length of stay in the ICU of equal or greater than 48 hours, so that there were no significant changes in patient’s health and that all nurses could do the assessments in the same individuals.

For data collection two forms were used: the first, with questions regarding nurses demographics and the second, a standardized instrument in the institution containing the Braden Scale for risk assessment. Data collection was performed by the researcher, a certificated clinical nurse specialized in Dermatology and Stomatherapy, who conducted the physical examination and risk assessment of patients selected by applying the tool above, this assessment was considered the “gold standard” for comparison with assessments made by nurses.

Patient evaluation was made by the researcher twice a week during the month of data collection.
Agreement between nurses regarding patients’ risk for developing pressure ulcer

in each ICU. Then, after the evaluation by the researcher, in the same day or at most the next day, the nurses performed the evaluation in the same patients during their work shift. They were instructed to only punctuate subscale scores and not to make comments on each others assessments.

The values of total scores and subscale scores of the Braden Scale obtained by assisting nurses were compared to those found by the researcher. To analyze the data we used the softwares Epi Info and Statistical Package for Social Science. The mean values, standard errors and confidence intervals (95%) values were calculated for the total score and subscale scores.

To investigate the agreement between the nurses, the results were analyzed using the Intraclass Correlation Coefficient in the case of observation of quantitative variables. The Kappa coefficient was used in the case of qualitative variable resulting from the total score of the Braden Scale: no risk, mild risk, moderate risk, high risk and very high risk. The ICC values under 0.40 were considered poor; satisfactory, between 0.40 (including) and 0.75; and excellent, values greater than or equal 0.75. In the case of Kappa Statistics Test, it was adopted 1 as the value of total agreement and, negative values, inconsistency. In all analyzes the level of significance was set at $\alpha= 0.05$.

The study followed the development of national and international ethics standards in research involving humans.

Results

From the 22 nurses participating in the study, most were female (90.9%), mean age 29 years old, mean time of profession of five years, mean experience time in ICU of four years, and the mean experience time in the current ICU of two years and eight months.

The results showed that only ICU 1 had excellent agreement between the mean subscale scores obtained by nurses and researcher for most subscales.

Considering the four ICUs, the subscales in which nurses and the researcher obtained excellent agreement were Sensory Perception and Mobility.

### Table 1. Analysis of agreement between nurses and researcher on the risk assessment by the subscales of the Braden Scale for patients of ICU 1 and 2

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ICU 1*</th>
<th>ICU 2**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICC* p-value</td>
<td>ICC** p-value</td>
</tr>
<tr>
<td>Sensory Perception (1-4)</td>
<td>0.99 &lt;0.001****</td>
<td>0.96 &lt;0.001****</td>
</tr>
<tr>
<td>Moisture (1-4)</td>
<td>0.84 &lt;0.001****</td>
<td>0.27 0.12</td>
</tr>
<tr>
<td>Activity (1-4)</td>
<td>0.77 &lt;0.001****</td>
<td>0.56 &lt;0.001****</td>
</tr>
<tr>
<td>Mobility (1-4)</td>
<td>0.96 &lt;0.001****</td>
<td>0.91 &lt;0.001****</td>
</tr>
<tr>
<td>Nutrition (1-4)</td>
<td>0.45 0.02***</td>
<td>-0.55 0.99</td>
</tr>
<tr>
<td>Friction &amp; Shear (1-3)</td>
<td>0.91 &lt;0.001****</td>
<td>0.86 &lt;0.001****</td>
</tr>
</tbody>
</table>

Legend: *ICU 1 (n=19), ICC (95% CI); **ICU 2 (n=19), ICC (95% CI); ***0.01<p≤0.05; **** p<0.01

### Table 2. Analysis of agreement between nurses and researcher on the risk assessment by the subscales of the Braden Scale for patients of ICU 3 and 4

<table>
<thead>
<tr>
<th>Subscale</th>
<th>ICU 3*</th>
<th>ICU 4**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICC* p-value</td>
<td>ICC** p-value</td>
</tr>
<tr>
<td>Sensory Perception (1-4)</td>
<td>0.91 &lt;0.001****</td>
<td>0.85 &lt;0.001****</td>
</tr>
<tr>
<td>Moisture (1-4)</td>
<td>-0.04 0.56</td>
<td>0.21 0.21</td>
</tr>
<tr>
<td>Activity (1-4)</td>
<td>0.00 0.50</td>
<td>0.00 0.50</td>
</tr>
<tr>
<td>Mobility (1-4)</td>
<td>0.88 &lt;0.001****</td>
<td>0.80 &lt;0.001****</td>
</tr>
<tr>
<td>Nutrition (1-4)</td>
<td>0.60 &lt;0.001****</td>
<td>0.16 0.28</td>
</tr>
<tr>
<td>Friction &amp; Shear (1-3)</td>
<td>0.69 &lt;0.001****</td>
<td>0.64 &lt;0.001****</td>
</tr>
</tbody>
</table>

Legend: *ICU 3 (n=19), ICC (IC 95%); **ICU 4 (n=15), ICC (IC 95%); ***0.01<p≤0.05; **** p<0.01

The subscale Moisture was the one with less agreement between the nurses and the researcher, classified as poor in ICUs two and four, and there was no degree of agreement in the ICU three (negative ICC).

Regarding the Activity subscale, the ICU two showed satisfactory agreement and the ICUs three and four showed no agreement.
Regarding the Nutrition subscale, there was satisfactory agreement only in ICUs one and three. For the subscale Friction & Shear, the agreement was excellent in ICUs one and two; ICUs three and four showed satisfactory agreement.

Regarding the total score of the Braden Scale and the classification into risk levels, the results of the analysis of agreement between the researcher and the nurses are shown in Tables three and four. However, when risks were classified, patients who were considered by the researcher with no risk category had to be excluded from analysis because no nurse predicted this category to any patient, this way, so the number of patients was reduced from 72 to 56.

It was found that, in general, no significant difference between the mean total scores obtained by the researcher and nurses, and it was observed only partial agreement in ICUs one and two (kappa <1 and p <0.01).

Table 3. Analysis of agreement between nurses and researcher on the total score of the Braden scale and the classification of patients into risk levels

<table>
<thead>
<tr>
<th>ICU</th>
<th>Researcher Score x ± SD</th>
<th>Nurse Score x ± SD</th>
<th>Kappa Coefficient</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13.16 ± 3.74 (7-20)</td>
<td>12.5 ± 3.63 (7-19)</td>
<td>0.561</td>
<td>0.001*</td>
</tr>
<tr>
<td></td>
<td>(n=15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>14.79 ± 3.52 (10-20)</td>
<td>14.08 ± 3.25 (10-19)</td>
<td>0.862</td>
<td>0.001*</td>
</tr>
<tr>
<td></td>
<td>(n=12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>12.21 ± 2.85 (9-20)</td>
<td>12.42 ± 2.37 (10-18.5)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>(n=17)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>13.20 ± 2.73 (11-19)</td>
<td>13.30 ± 2.16 (10-18)</td>
<td>0.333</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>(n=12)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend: n - Number of patients assessed and considered for statistical analysis = 56; x – arithmetic Mean; SD – Standard Deviation; *p< 0.01

In ICU three, the Kappa value corresponded to zero because it was not possible to perform this coefficient calculation for the category “high risk” found by the researcher for some patients, no nurse predicted any patient in this category.

Considering the levels of risk, there was no difference between the risk assessments given by the researcher with greater frequency by nurses in their ICUs. In ICU one, the predictive predominant risk level was Moderate to researcher and Very High Risk for nurses, in ICU two, High Risk for the researcher and Mild Risk for nurses, in ICU three and four, High Risk for the researcher and Nurses.

## Discussion

This study was limited by the size of the group studied. This limitation is due to the own characteristic of studies conducted in actual practice, in which several factors are limiting, such as, shifts change, hours taken, absences and sick leave by medical order.

However, even with this limitation, the study found that, although no significant difference between the mean total scores of the Braden scale obtained by the researcher and nurses, there were differences in the classification of patients into risk levels. The lack of agreement on this point, besides jeopardizing the correct calculation of the incidence of the respective sector, it can also interfere with the proper planning of preventive measures, as these should be prescribed according to the level of risk of each patient. \((8,10,11)\)

Table 4. Classification of patients into risk levels predicted by the researcher and nurses in their ICUs

<table>
<thead>
<tr>
<th>Classification</th>
<th>ICU 1</th>
<th>ICU 2</th>
<th>ICU 3</th>
<th>ICU 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk level</td>
<td>Resea (n)</td>
<td>Nur (nav)</td>
<td>Resea (n)</td>
<td>Nur (nav)</td>
</tr>
<tr>
<td>No risk</td>
<td>4</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Mild</td>
<td>3</td>
<td>15</td>
<td>3</td>
<td>49</td>
</tr>
<tr>
<td>Moderate</td>
<td>6</td>
<td>7</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>High</td>
<td>3</td>
<td>15</td>
<td>7</td>
<td>37</td>
</tr>
<tr>
<td>Very high</td>
<td>3</td>
<td>19</td>
<td>1</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>19</td>
<td>57</td>
<td>19</td>
<td>114</td>
</tr>
</tbody>
</table>

Resea - Researcher; Nur - Nurse; n – number of patients assessed by researcher; nav - number of patients assessed by nurses in their respective ICUs
As for the agreement regarding the six Braden subscales, only two were rated excellent in all ICUs. Moisture and Nutrition subscales presented the biggest agreement problems, corroborating the results obtained by other authors.\(^{(7,9,11)}\)

Regarding Moisture, authors cite three possible explanations for the poor agreement found. The first would be that this subscale descriptors require the evaluator to have knowledge about the patterns of sweating and incontinence of the assessed patient.\(^{(10)}\) The second, is the fact that these standards may not be evident at first evaluation of the patient, requiring more time for nurses to search for information.\(^{(10,11)}\) The third explanation is still the possibility of problems in the interpretation of descriptions of items of the subscale.\(^{(7,10,15)}\)

As for the poor agreement in Nutrition subscale, authors emphasize that as this subscale is rated according to the patient’s intake, it may be necessary to seek information from other sources about the nutritional history, which require more time from the nurse, possibly representing a barrier for choosing the correct score.\(^{(11,15)}\)

It is worth noting that the results showed that although nurses routinely use the instrument containing the summarized Braden Scale, difficulties were presented in the implementation of risk assessment for PU. Authors claim that having the complete version and not the summarized scale of risk available at the workplace, could help in choosing the appropriate descriptions.\(^{(6,10,11)}\) It is noticeable that, formal and continuing education of students and professionals aimed at learning and practicing the use of this tool, is essential to improve performance and reliability in the use of the scale, which has been highlighted also by several national and international authors cited above.\(^{(2,4,6,8,10,11,15)}\)

Whereas the lack of agreement on the assessment and classification of risk for pressure ulcer can lead to inadequate planning of patient care, this study brings contributions to the institution in which it was performed, since the work allow difficulties and directed planning improvements aimed at preventing the PU. Furthermore, this research contributes to knowledge in nursing because it demonstrates the need to assess agreement between nurses using risk assessment scales for PU in other institutions, to identify the occurrence of similar problems and the need for educational interventions.

**Conclusion**

Discrepancies were found regarding agreements between assisting nurses and, although no significant difference between the mean total scores of the Braden Scale, differences were found in the classification of patients into risk levels.

**Contributions**

Simão CMF; Caliri MHL and Santos CB declare that contributed to the conception and design, analysis and interpretation of data, drafting the article, revising it critically for important intellectual content and final approval of the version to be published.

**References**


User assessment of a digital learning environment

Avaliação de um ambiente digital de aprendizagem pelo usuário

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Luciana Mara Monti Fonseca
Laiane Medeiros Ribeiro
Carmen Gracinda Silvan Scochi

Objective: To assess the digital learning environment “Breastfeeding of Premature Infants” from users’ perspective.

Method: Descriptive and cross-sectional study with quantitative data analysis; sample of 30 mothers of hospitalized premature infants at a neonatal unit in the Brazilian Southeast to assess the users’ impression in general and about the contents of the digital environment.

Results: The criteria “good” and “excellent” for the general impression (visual, user friendliness and navigability) and contents (independent learning and breastfeeding) of the digital learning environment reached the expected agreement level (superior to 70%).

Conclusion: The users considered the digital environment “Breastfeeding of Premature Infants” easy to use, informative and important to support the mothers of premature infants with breastfeeding aspects.

Abstract

Keywords
Pediatric nursing; Education, nursing; Nursing education research; Computer-assisted instruction; Breast feeding

Resumo

Objetivo: Avaliar o ambiente digital de aprendizagem “Aleitamento Materno do Prematuro” sob a perspectiva do usuário.

Método: Estudo descritivo, transversal com análise quantitativa de dados; amostra composta por 30 mães de prematuros hospitalizados em uma unidade neonatal do Sudeste do País para a avaliação da impressão geral e do conteúdo do ambiente digital.

Resultados: Os critérios “bom” e “ótimo” relativos à impressão geral (visual, facilidade de uso e navegabilidade) e conteúdo (aprendizagem sem auxílio e aleitamento materno) do ambiente digital de aprendizagem atingiram a concordância esperada (acima de 70%).

Conclusão: O ambiente digital “Aleitamento Materno do Prematuro” foi considerado pelos usuários de fácil uso, informativo e importante para apoiar a mãe do prematuro nos aspectos relacionados ao aleitamento materno.

Conflicts of interest: no conflicts of interest to declare.
**Introduction**

In case of premature birth, the parents and family should receive support and orientation, including, among others, information to establish and maintain breastfeeding. Breastfeeding is a primordial element for the health and survival of the child, particularly of premature infants, because of its immunological properties, besides its importance in mother-child bonding. The incidence rate of successful breastfeeding for premature infants is low though, mainly at high-risk neonatal units, where weaning often takes place before discharge. A recent study identified that the most frequent causes of early weaning were related to educational factors, including lack of information and orientation.\(^1\)

In an integrative review to encourage reflections about the importance of health education for relatives of premature infants and professionals working at neonatal units showed that educative materials can contribute in this teaching process.\(^2\)

Believing in the value of educative material, in health care and education, one can also use the computer as an additional resources to orient families of hospitalized premature infants, as well as to prepare them for discharge.\(^3\)

The expansion of the Internet and its relative democratization around the world are well-known, as a resource that facilitates communication and education in several social contexts.\(^4\)

The possibilities the Internet offers include distance education, which the Ministries of Health and Education consider as a permanent education initiative.

Distance education has also been widespread in nursing, demonstrating the great possibilities this resource offers to teach care. On the other hand, to put distance education courses in practice, digital learning environments need to be used. These environments allow users to have contact with the contents and participate in activities, in a synchronous or asynchronous manner, provided that they have Internet access.

Various meanings exist for digital learning environments. In this study, they are defined as computer systems, available on the Internet, which permit the development of the teaching-learning process, in which information can be presented in different forms.\(^5\)

Technological advances induce motivation for the development and introduction of new technologies in health education and teaching, such as digital learning environments, with a focus on care delivery to premature infants and their family.\(^6\)\(^7\)

Through the progressive incorporation of new technologies and resources, according to the educational needs of society, educational approaches can be developed and applied through the Internet, enriching the teaching-learning process.

It is not just necessary to incorporate knowledge inherent in the area though, but also to seek and deepen substantiated concepts about the development and evaluation of educational technologies.\(^8\)

The assessment of digital learning environments can help to orient their better use and enhance their quality, by means of formative assessment throughout their development process.\(^6\)

Based on the development of a learning environment about breastfeeding for premature infants, it was questioned how the mothers of hospitalized premature infants would assess this educational technological resource.

It should be highlighted that the digital learning environment “Breastfeeding for Premature Infants”, presented here, results from a doctoral dissertation, in which the environment was constructed and validated, involving nursing and informatics experts. The learning environment was constructed based on the website development model “User Centered Design”, which intends to guarantee creative potential, is rich in visually attractive and user-friendly resources that are useful for the target population\(^7\), in this case mothers and family members of premature infants. The product is considered innovative because it addresses breastfeeding aspects, ranging from the period when the infant is not apt yet to suck at the breast, when milk production is maintained through milking, until breastfeeding at home. These contents are addressed interactively, in language that is easy to understand, including multimedia resources and simulations.
The present study is aimed at assessing the learning environment “Breastfeeding for Premature Infants” from a user perspective.

Methods

A descriptive and cross-sectional study with quantitative data analysis was undertaken between November 2011 and January 2012 at a neonatal unit in the Brazilian Southeast. Based on a convenience sample, the sole selection criterion adopted was the inclusion of mothers of premature infants hospitalized at the neonatal unit, who demonstrated the desire to breastfeed their child and accessed the digital environment. As an exclusion criterion, the contraindication of breastfeeding was used, due to maternal or neonatal factors. Thirty-four mothers of premature infants were invited, but four of them did not accept to participate in the study, totaling a sample of 30 participants. The users were contacted at the neonatal unit at different times, were invited to participate and, if they accepted, the research team scheduled a convenient time for data collection. As regards the premature infants, all of them, of different postnatal ages, were at the unit for at least two days, so as to guarantee the mothers’ inclusion at distinct times in the breastfeeding process.

It should be emphasized that, in studies about the assessment of digital learning environment, no probabilistic samples have been used, but populations with defined characteristics and a convenience sample. Convenience sampling is appropriate and frequently used to generate ideas in exploratory studies. Intentional samples are selected at the researcher’s judgment and are widely used when one wants to assess the opinion of specific groups about a certain problem or hypothesis. (9)

Although the digital learning environment in this study was constructed for availability on the Internet, the user assessment process was off line, due to difficulties to access the network at the neonatal unit, which could make the assessment impossible, besides their preference to access it while staying with their child at the unit. Therefore, to collect the data, a notebook was made available to the users, on which the digital environment had been installed. To reduce the study bias, the research team contacted the users at different times (between eight a.m. and six p.m.), at an appropriate time for data collection, and interfered neither in the navigation through the digital environment, nor in the completion of the questionnaire, unless help were requested.

Considering that the assessment was done by end users of the digital learning environment, the decision was made to assess criteria related to impressions about the educational resource and the contents addressed. Thus, two questionnaires were elaborated (1 – general impression with six items; 2 – contents with three items), based on another study developed in Brazil. (6) A pilot test was developed with four users, so as to check the appropriateness of the terms for the study population. After free navigation in the learning environment, the users marked the concepts very bad, bad, regular, good or excellent. In addition, suggestions or comments could be expressed verbally or registered in the questionnaire.

Descriptive statistics were used, with simple frequency distribution in absolute and relative values, central trend and dispersion measures, included in an electronic worksheet (Excel 2007®), validated through double data entry, exported and analyzed in Epi-Info software, version 3.5.3. The digital learning environment was considered appropriate if at least 70% of the users attributed the concept good or excellent to each instrument item, in accordance with the criterion adopted in other studies. (6,8)

The study development complied with Brazilian and international ethical standards for research involving human beings.

Results

The users’ mean age was 24.6 years (SD 5.7 years), and the mean education 9.1 years (SD 3.2 years). As regards the infants, the mean gestational age at birth was 32.4 weeks (SD 3.1 weeks), with a mean
weight at birth of 1,709 grams (SD 569.4 grams). Data in table 1 present the characteristics.

**Table 1. Sociodemographic characteristics of mothers of premature infants hospitalized at a neonatal unit**

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin</td>
<td></td>
</tr>
<tr>
<td>Ribeirão Preto</td>
<td>10(33.3)</td>
</tr>
<tr>
<td>Other cities</td>
<td>20(66.7)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>6(20.0)</td>
</tr>
<tr>
<td>Married</td>
<td>15(50.0)</td>
</tr>
<tr>
<td>Others</td>
<td>9(30.0)</td>
</tr>
<tr>
<td>Work</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>17(56.7)</td>
</tr>
<tr>
<td>Yes</td>
<td>3(10.0)</td>
</tr>
<tr>
<td>Delivery type</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>15(50.0)</td>
</tr>
<tr>
<td>Cesarean</td>
<td>15(50.0)</td>
</tr>
</tbody>
</table>

Out of thirty users who participated in the study, 18 (60.0%) affirmed they knew how to use a computer, 12 (40.0%) did not and five of them needed help for navigation. The mean navigation time in the digital learning environment was 28.1 minutes (SD 10.8).

Data in table 2 demonstrate the users’ assessment in terms of general impression; table 3 shows the data for the content assessment.

Most users (76.7%) described learning as a positive aspect in the assessment, as they considered that “...the site is very clear and user-friendly...”.

As regards the content of the environment, one user considered the images and texts appropriately illustrated, facilitating the understanding of the contents. Another fact one user referred was that the site should be made available some time before birth, so as to solve doubts and help the mothers.

Some comments and suggestions were made though, which will be incorporated into the new version of the digital environment. One user suggested making the homepage more attractive, with better illustrations, and another questioned the difficulty to answer the educative games.

**Table 2. Users’ general impression about the digital learning environment “Breastfeeding for Premature Infants”**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Very bad n(%)</th>
<th>Bad n(%)</th>
<th>Regular n(%)</th>
<th>Good n(%)</th>
<th>Excellent n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>The visual is pleasant</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>21(73.3)</td>
</tr>
<tr>
<td>User-friendly</td>
<td>1(3.3)</td>
<td>3(10.0)</td>
<td>5(16.7)</td>
<td>21(70.0)</td>
<td></td>
</tr>
<tr>
<td>Shows immediate return</td>
<td>1(3.3)</td>
<td>1(3.3)</td>
<td>8(26.7)</td>
<td>21(70.0)</td>
<td></td>
</tr>
<tr>
<td>Permits independent navigation</td>
<td>1(3.3)</td>
<td>1(3.3)</td>
<td>5(16.7)</td>
<td>2(6.7)</td>
<td>21(70.0)</td>
</tr>
<tr>
<td>Permits choosing what you want to learn about breastfeeding</td>
<td>7(23.3)</td>
<td>23(76.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Would recommend the site to friends/relatives</td>
<td>4(13.3)</td>
<td>26(86.7)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 3. Users’ assessment about the contents of the digital learning environment “Breasfeeding for Premature Infants”**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Very bad n(%)</th>
<th>Bad n(%)</th>
<th>Regular n(%)</th>
<th>Good n(%)</th>
<th>Excellent n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides independent learning</td>
<td>1(3.3)</td>
<td>2(6.7)</td>
<td>2(6.7)</td>
<td>6(20.0)</td>
<td>19(63.3)</td>
</tr>
<tr>
<td>Permits learning about breastfeeding for premature infants</td>
<td>6(20.0)</td>
<td>24(80.0)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It would be interesting to have a site with other themes related to premature infants</td>
<td>1(3.3)</td>
<td>1(3.3)</td>
<td>6(20.0)</td>
<td>22(73.4)</td>
<td></td>
</tr>
</tbody>
</table>

**Discussion**

The users of the virtual learning environment positively assessed all items addressed and considered
that the technology could facilitate information gaining about breastfeeding.

The study limitation referent to the sample should be highlighted, as the participants were predisposed to breastfeeding, a fact that could positively interfere in the assessment. Nevertheless, a convenience sample was chosen, as the mothers are the end users of the digital environment in the perspective of information and knowledge acquisition to start and maintain breastfeeding.

The use of information in nursing teaching, particularly learning environments, has become more intense in recent years, mainly at teaching and research centers, including the clear need to involve users in assessment to put this technological resource in practice.\(^9\)

As regards the visual presentation of the environment, although one user referred to the colors, suggesting the use of more attractive shades, clearer shades are recommended for the background, especially monochromatic colors, which enhance the visibility of other shades and facilitate reading.\(^10\)

The estimated navigation time in the learning environment is two hours, although the participants used about a quarter of the estimated time. This fact could be justified by the short time the mothers had available for navigation, considering that, at the place where the assessment took place, the neonatal unit, despite the above described care the research team took, many professionals and family members move around, with the presence of noisy equipment and countless procedures and events that attract the users’ attention during navigation. Therefore, computer technology is considered a valuable resource for information acquisition, but may not lead to increased knowledge if used separately, as learning is a complex process.\(^11\)

Although 12 users affirmed they did not know how to use the computer, seven did not need help for navigating. This finding may be associated with data from the National Household Survey supplement, which reveal increased Internet access. Hence, even if they users had little opportunity to actually use the computer, the equipment and its handling are not totally unknown.\(^12\)

As all users said they would recommend the technology to friends and relatives, demonstrating satisfaction with the digital environment, it is inferred that these mothers may positively disseminate this tool, evidencing the contributions of similar resources in the teaching and learning process in health and nursing.\(^13\)

This study contributes as the digital learning environment joins three main moments in care delivery to premature infants and families in a single educational tool: the first after birth, when the infant is not apt to breastfeed yet, when milking is needed and the mother’s preparation to breastfeed; the second when breastfeeding starts, when the professional’s presence is fundamental to help and solve doubts and questions; and the third upon discharge, when doubts, questions and insecurity on how to maintain breastfeeding at home emerge. In this sense, one participant referred that she could have benefitted from this information, evidencing this resource’s contribution.

The actions health professionals need to perform to direct care need to be based on the infants and families’ needs, with a view to comprehensive care delivery at neonatal intensive care units.\(^15\) Hence, the digital learning environment can be incorporated into clinical practice at the neonatal unit after suggestions to make the homepage more attractive and adapt the games have been attended to.

Depending on the way it is used, the site can be considered an auxiliary technology in health education actions direct at the mothers and family members of premature infants, contributing to the teaching-learning process about breastfeeding. However, although the users considered it appropriate, further research with larger samples is needed, representative of other neonatal care realities. In view of the complexity of developing learning environments, the assessment process of a digital environment is fundamental, aiming for the end users’ satisfaction.\(^6\)

The development and assessment of educational technologies with a community focus can be a promising area for further research, without forgetting about the humanization of nursing care though.

**Conclusion**

The users considered the environment “Breastfeeding of premature infants” easy to use, informative
and important and all items reached the expected agreement levels (superior to 70%).

Acknowledgements
To Geovana Magalhães Ferecini for making available the digital learning environment to the mothers of the hospitalized premature infants; and to the Brazilian Scientific and Technological Development Council – CNPq for the grant (Call MCT/CNPq 014/2010 – process 480809/2010-0 and postdoctoral fellowship – process 510600/2010-7) for the accomplishment of this study.

Contributions
Vasconcelos MGL; Góes FSN and Scochi CGS declare that they contributed to the conception and project, data analysis and interpretation; Writing of the paper, relevant critical review of the intellectual contents and final approval of the version for publication. Fonseca LMM and Ribeiro LM contributed to data analysis and interpretation; relevant critical review of the intellectual contents and final approval of the version for publication.

References
Administration of medications for children born exposed to human immune deficiency virus

Administração de medicamentos para crianças nascidas expostas ao vírus da imunodeficiência humana

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Gilmara Holanda da Cunha²
Léa Maria Moura Barroso¹
Marli Teresinha Gimenez Galvão³

Abstract

Objective: To evaluate HIV-positive mothers’ ability to administer zidovudine and trimethoprim-sulfamethoxazole (SMZ/TMP) prophylaxis for HIV-exposed infants.

Methods: This cross-sectional and quantitative study was carried out at a reference hospital for HIV/AIDS patients in Fortaleza (CE), Brazil. A total of 60 mothers responded to the ability assessment scale for the care of HIV-exposed children.

Results: The level of ability to administer zidovudine varied from moderate to high. Maternal variables did not show significant differences (p>0.05). TMP/SMZ administration varied from low, moderate, and high. The variable “parity” was related to a high level of care (p=0.051).

Conclusion: The level of ability of mothers to administer AZT syrup (factor I) varied from moderate to high; with SMZ-TMP administration (factor IV), no difference among low, moderate, and high was seen.

Resumo

Objetivo: Avaliar a capacidade de mães com HIV/AIDS de administrar a zidovudina e a profilaxia com sulfametoxazol-trimetoprima aos filhos nascidos expostos ao HIV.

Métodos: Estudo transversal e quantitativo, realizado em hospital de referência no atendimento a casos de HIV/AIDS em Fortaleza (CE), Brasil. Utilizou-se a Escala de Avaliação da Capacidade para Cuidar de Crianças Expostas ao HIV, que foi respondida por 60 mães.

Resultados: O nível de capacidade de administrar a zidovudina variou de moderado a alto, sem diferenças significantes em relação às variáveis maternas (p>0.05). Em relação à administração do sulfametoxazol-trimetoprima, o nível de capacidade variou entre baixo, moderado e alto. A variável materna “paridade” apresentou relação com o nível de cuidado alto (p=0.051).

Conclusão: O nível de capacidade das mães para administrar o AZT xarope (Fator I) variou de moderado a alto e para administrar e SMZ-TMP (Fator IV), o nível de capacidade de administração distribuiu-se sem diferença entre baixo, moderado e alto.

Keywords
Nursing care; Maternal-child nursing; Clinical nursing research; HIV; Zidovudine

Descritores
Cuidados de enfermagem; Enfermagem materno-infantil; Pesquisa em enfermagem clínica; HIV; Zidovudina

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Conflicts of interest: the authors have no relevant conflicts of interest to disclose.
Introduction

AIDS is a disease that has been considered a pandemic and major public issue for decades.\(^1\) The AIDS epidemic in Brazil is complex and dynamic because it was first found to occur among homosexual men, and later, among people who received blood transfusions and those who used injection-type drugs. Nowadays, this disease is more prevalent among heterosexual men and women, with percentages of 43.4% and 96.3%, respectively. In addition, AIDS has been affecting more individuals at reproductive age.\(^2,3\)

The increase of HIV-infected women during the reproductive years has determined the occurrence of infants exposed to the virus during delivery. Vertical transmission (VT) is the main cause of HIV infection in children.\(^4\) Pediatric AIDS clinical trials group protocol 076 has been shown to reduce VT of HIV by use of zidovudine (AZT), which was given from 14 weeks’ gestation, intravenously until delivery, and until umbilical cord clamping.\(^5\)

In newborns exposed to HIV, breastfeeding should be replaced by artificial milk and other foods, depending on the infant’s age. Administration of AZT syrup (10 mg/mL) should be performed until the second hour postpartum for six weeks. After the fourth and sixth weeks of life, until a definitive diagnosis of HIV-positive or HIV-negative infection is given, the child must receive chemoprophylaxis against *Pneumocystis jiroveci* pneumonia (previously called *Pneumocystis carinii*), with trimethoprim-sulfamethoxazole (TMP/SMZ) (SMZ 25-40 mg/kg per day and TMP 5-10 mg/kg per day) in two divided doses per day, three times per week, or on alternate days.\(^5,6\)

Rates of VT of HIV without any intervention during gestation are between 25% and 30%. Children whose mothers are HIV-positive have a lower risk of becoming infected with the virus if VT is adequately prevented.\(^5,6\) It is important to emphasize that if all proper protocols were followed during the prenatal and at delivery period, then mothers must be responsible for the care of their children in the postpartum period involving the administration of AZT syrup and TMP/SMZ prophylaxis. Administration of these medicines is essential to protect infants against HIV and pneumonia, which usually affects children infected with HIV during the first year of life.\(^6\) However, studies have demonstrated nonadherence to such drug therapy. As a result, the numbers of infected children, cases of pneumonia, and cases of other comorbidities have grown.\(^1,7,8\)

AZT and TMP-SMZ administration for HIV-exposed children is a challenge because it is done at home and depends on the mother or other caregiver, who must be advised about the therapeutic regimen. Considering the relevance of this topic, this study evaluated the ability of HIV-positive mothers to administer AZT syrup and TMP-SMZ prophylaxis to their newborns exposed to maternal HIV infection.

Methods

This cross-sectional and quantitative study was carried out at Hospital São José de Doenças Infecciosas (HSJDI) which is specialized in the care of HIV/AIDS-positive individuals in Fortaleza (CE), Brazil. This ambulatory service for adult and pediatric infection provides antiretroviral drugs, laboratory and radiological tests, internships, and psychosocial and nutritional support.

The study population was composed of HIV/AIDS-infected mothers whose children (up to age 12 months) were exposed to HIV at delivery. On the basis of the number of deliveries by HIV-positive pregnant women in Fortaleza between 2009 and 2010 (n=122), a convenient sample of 60 biological mothers was included. This population represented 49.2% of births of HIV-exposed children. The convenient sample was gathered in the ambulatory service when mothers took their children to the first medical follow-up visit when this study was performed.

The inclusion criterion was mothers who were able to care for their children by themselves, and exclusion criteria were individuals with mental disease, those who were in the advanced stage of AIDS, and women who had other conditions that kept them from properly caring for their children.
We collected data using the following forms: (1) sociodemographic and clinical-epidemiological featuring for the mothers; (2) clinical-epidemiological featuring for the child and prophylactic measures to reduce VT; and (3) a ability assessment scale regarding the care of HIV-exposed children (EACCC-HIV, acronym in Portuguese), which was developed and validated in Brazil. Interviews were conducted in an office at the hospital. For validation of these instruments, three pilot interviews, not included in the sample, were conducted to train researchers in data collection.

The EACCC-HIV assessed health care delivered to HIV-exposed children from birth to age 12 months using five factors: factor I – ability to administer AZT syrup for children until the age 42 days; factor II – ability to prepare and feed children until age one year with dry milk; factor III – ability to prepare and introduce complementary food to children older than four months; factor IV – ability to administer TMP-SMZ prophylaxis for children with older than age 42 days until age one year; factor V – ability to guarantee adherence to clinical follow-up and vaccination. Each factor could be assessed separately, which indicated the mother's performance in each aspect.

To achieve the aim of this study, we used factors I and IV related to administration of medicines. Each factor covered four questions. Questions for factor I consisted of the following: (1) I prepared AZT syrup following medical prescription; (2) I administered AZT syrup every six hours; (3) I forgot to give AZT syrup to my baby; (4) I’m aware of treatment duration with AZT syrup that my baby will need. Factor IV included the following questions: (1) I prepared AZT syrup following medical prescription; (2) I gave my baby TMP-SMZ three times a week on alternate days; (3) I forgot to give AZT syrup to my baby; and (4) I administered to my child medicines for pain, fever, or diarrhea not prescribed by the doctor.

On the basis of the EACCC-HIV, participants must indicate only one answer related to how often children received care. A scale resembling the Likert scale, varying from one to five points, was used. Answers were never, hardly ever, sometimes, many times, and always. Classification of care level ability occurred based on points: low (four to nine points), moderate (ten to 15 points), and high (16 to 20 points).

Data collected were entered into Excel 97 and were exported to the Stata statistical package, version 11, to treat and generate results. Nominal and ordinal categorical variables were described using univariate and bivariate frequency distributions. For evaluation of continuous variables, mean, standard deviation, and median were obtained. Bivariate analyses were performed to describe and verify proportional differences between care level ability expressed by EACCC-HIV dimensions. The Fisher exact test was used to establish maternal characteristics.

The significance level used in all analyses was 5% (p≤0.05). We used the Cronbach alpha coefficient, which measures the degree of correlation among items of the scale; values varied from zero to one. The value more close to number one had a stronger correlation among items. The classification of correlation among answers was between 0.70 and 0.90 (good internal consistency), less than 0.70 (weak internal consistency), and more than 0.90 (high concordance).

This study followed the national and international ethical and legal aspects of research on human subjects.

Results

This study was composed of 60 HIV-positive biological mothers in different stages of the disease. Participants provided care information on 62 children; two mothers had twin pregnancies.

The mothers’ profile, main sociodemographic features, and clinical-epidemiological characteristics are presented. More than half of the mothers were 29 years old (55.0%); the mean age was 28.8±6.0 years. The majority of participants were married or had a stable relationship (78.3%). Regarding education, 20 women (33.3%) had five or less years of study, and 51 (85.0%) were unemployed. In general, family income was two minimum wages that
were reported by 45.0% of participants. When this study was conducted, the minimum wage was R$510.00.

A total of 30 women (50.0%) reported receiving AZT during pregnancy from 14 weeks’ gestation. It is important to highlight that eight mothers did not receive AZT during gestation.

One child (1.6%) had an HIV-positive diagnosis, and 32 (51.6%) were not tested for HIV infection. Most of the children were 7 months old (37%) and were delivered at term (69.3%). Regarding breastfeeding, 53 children (85.5%) were not breastfed; however, 3.2% were breastfed and 11.3% had mixed feeding. AZT syrup was administered within 24 hours after birth for 61 newborns (98.4%). During the study, 11 children (17.8%) were receiving AZT prophylaxis. No statistically significant findings were found among variables (p>0.05) (Table 1).

From the total, only ten mothers answers questions related to factor I regarding evaluation function of children up to age 42 days. A total of 50 mothers whose children’s ages ranged from 43 days up to 12 months answered factor IV questions. Twin mothers answered each factor, which resulted in 11 children in dimension I and 51 children in dimension IV.

The level of the ability to administer AZT syrup (factor I) varied from moderate to high. We did not find proportional differences regarding participants’ characteristics and ability level to administer the medicine. Regarding TMP-SMZ prophylaxis (factor IV), the ability level of administration varied among low, moderate, and high. Parity was represented by the number of children, which consisted of three children with a higher percentage when a high level of care was delivered. Parity had proportional significant differences in borderline level concerning the ability to administer TMP-SMZ prophylaxis (p=0.051).

We did not find significant differences among the mothers; however, participants with more years of education had a higher ability to administer TMP-SMZ prophylaxis (42.1%), which suggests that more educated people tend to act more positively in this dimension. The Cronbach alpha coefficient had values of 0.96 in dimension I and 0.85 in dimension IV, which indicated meant high internal consistency and good internal consistency, respectively (Table 2 and 3).

### Table 1. Clinical-epidemiological characteristics of children and prophylactic measures to reduce vertical transmission

<table>
<thead>
<tr>
<th>Children's characteristics</th>
<th>Gender</th>
<th></th>
<th></th>
<th></th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male n(%)</td>
<td>Female n(%)</td>
<td>Total n(%)</td>
<td></td>
</tr>
<tr>
<td>Anti-HIV serology results</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive</td>
<td>1(3.0)</td>
<td>0(0.0)</td>
<td>1(1.6)</td>
<td>0.661</td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>6(17.6)</td>
<td>5(17.8)</td>
<td>11(17.7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inconclusive</td>
<td>11(32.4)</td>
<td>6(21.4)</td>
<td>17(27.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not performed</td>
<td>16(47.0)</td>
<td>17(60.8)</td>
<td>33(53.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age (months)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 1</td>
<td>5(14.7)</td>
<td>3(10.7)</td>
<td>8(13.0)</td>
<td>0.848</td>
<td></td>
</tr>
<tr>
<td>2 - 3</td>
<td>7(20.5)</td>
<td>7(25.0)</td>
<td>14(22.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 - 6</td>
<td>11(32.4)</td>
<td>7(25.0)</td>
<td>18(29.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≥ 7</td>
<td>11(32.4)</td>
<td>11(39.3)</td>
<td>22(35.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gestational age at birth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preterm</td>
<td>10(29.5)</td>
<td>8(28.5)</td>
<td>18(29.0)</td>
<td>0.789</td>
<td></td>
</tr>
<tr>
<td>At term</td>
<td>24(70.5)</td>
<td>20(71.5)</td>
<td>44(71.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Post-term</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td>0(0.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2(5.8)</td>
<td>0(0.0)</td>
<td>2(3.3)</td>
<td>0.077</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>26(76.5)</td>
<td>27(96.5)</td>
<td>53(85.5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed feeding</td>
<td>6(17.7)</td>
<td>1(3.5)</td>
<td>7(11.2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of AZT use*** (syrup)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within 24 hours</td>
<td>33(97.0)</td>
<td>28(100.0)</td>
<td>61(98.4)</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Not used</td>
<td>1(3.0)</td>
<td>0(0.0)</td>
<td>1(1.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time of prophylaxis initiation (AZT)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In use</td>
<td>5(14.7)</td>
<td>6(21.5)</td>
<td>11(17.8)</td>
<td>0.942</td>
<td></td>
</tr>
<tr>
<td>3 to 5 weeks</td>
<td>2(5.8)</td>
<td>1(3.5)</td>
<td>3(4.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 weeks</td>
<td>26(76.5)</td>
<td>21(75.0)</td>
<td>47(75.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No used</td>
<td>1(3.0)</td>
<td>0(0.0)</td>
<td>1(1.6)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend: n(%) values: n(%) men 34(54.8), n(%) women 28(45.2), n(%) total 62(100); *p-value obtained in chi-square test or Fisher exact test; **Regarding children’s age: mean: 5 months, minimal value: 7 days of life, maximum value: age 12 months; ***AZT: zidovudine
Table 2. Maternal variable distribution and ability level to administer zidovudine syrup (SMZ) and sulfamethoxazole (SMZ) prophylaxis associated with trimethoprim (TMP)

<table>
<thead>
<tr>
<th>Maternal features</th>
<th>Ability level to administer AZT syrup (factor I)*</th>
<th>Ability level to administer TMP-SMZ(factor IV)**</th>
<th>p value***</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low(n%)</td>
<td>Moderate(n%)</td>
<td>High(n%)</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 29</td>
<td>-</td>
<td>2(66.7)</td>
<td>4(57.1)</td>
</tr>
<tr>
<td>30 - 39</td>
<td>-</td>
<td>1(33.3)</td>
<td>3(42.9)</td>
</tr>
<tr>
<td>40 - 49</td>
<td>-</td>
<td>0(0.00)</td>
<td>0(0.00)</td>
</tr>
<tr>
<td>Parity (number of children)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 - 3</td>
<td>-</td>
<td>3(100.0)</td>
<td>7(100.0)</td>
</tr>
<tr>
<td>≥ 4</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Educational level****</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 5</td>
<td>-</td>
<td>0(0.0)</td>
<td>1(14.3)</td>
</tr>
<tr>
<td>6 – 9</td>
<td>-</td>
<td>1(33.3)</td>
<td>4(57.1)</td>
</tr>
<tr>
<td>≥ 10</td>
<td>-</td>
<td>2(66.7)</td>
<td>2(28.6)</td>
</tr>
<tr>
<td>Family income*****</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 1</td>
<td>-</td>
<td>1(33.3)</td>
<td>2(28.6)</td>
</tr>
<tr>
<td>1 - 2</td>
<td>-</td>
<td>2(66.7)</td>
<td>3(42.9)</td>
</tr>
<tr>
<td>≥ 3</td>
<td>-</td>
<td>0(0.0)</td>
<td>2(28.5)</td>
</tr>
</tbody>
</table>

Legend: *(Factor I) n = 10, **(Factor IV) n = 50; *p-value obtained in chi-square test or Fisher exact test; ****Education: years of study; *****Amount of minimum wage: value of wage in the period of the study: R$510,00

Table 3. Percentage distribution and descriptive measures of dimensions of care ability

<table>
<thead>
<tr>
<th>Dimensions (Factors)</th>
<th>Total of mothers</th>
<th>Total of children</th>
<th>Low n(%)</th>
<th>Moderate n(%)</th>
<th>High n(%)</th>
<th>Mean ± SD*</th>
<th>Medium</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>10</td>
<td>11</td>
<td>0(0.0)</td>
<td>3(27.3)</td>
<td>7(72.7)</td>
<td>16.4 ± 3.0</td>
<td>16</td>
<td>0.96</td>
</tr>
<tr>
<td>IV</td>
<td>50</td>
<td>51</td>
<td>4(7.8)</td>
<td>8(15.7)</td>
<td>38(7.5)</td>
<td>16.7 ± 4.1</td>
<td>18</td>
<td>0.85</td>
</tr>
</tbody>
</table>

Legend: * SD: Standard Deviation

**Discussion**

A limitation of this study was the seemingly impossible task of following administration of medicines in loco in the children’s homes. However, a similar approach was used in other analyses on this topic; therefore, this approach renders our findings relevant. Another limitation was the sample size, particularly concerning the number of respondents to factor I. This fact could be justified by the difficulty obtaining this information because it applied only to children up to age 42 days.

Mothers or caregivers must be able to follow recommendations to reduce VT of HIV; it is also important that people understand the risks involved in nonadherence to treatment.

AIDS is a complex disease that causes changes in biological, social, and psychological aspects of patients’ lives, and because of these expressive life changes, several studies are encouraged on this topic.(10-12) In our study, most of the HIV-infected women were 30 years old or younger, which represents this disease dynamic in Brazil where most of women infected with the HIV virus are of reproductive age.(3) In our study, most of HIV-positive women were married or had a stable relationship; this finding is in accordance with a previous study on this topic.(2,7) Concerning educational
level, few mothers had more than ten years of education. These data corroborate what was shown in similar studies.\(^2,7,13\) Therefore, such findings suggest a progressive epidemic spread of AIDS among people with low educational levels.

The increase of the number of AIDS cases among people with low educational levels is described as a poverty epidemic, so low family income is a main contributor.\(^3,14\) In addition, a higher percentage of women in our were unemployed. Considering these facts, we emphasize that financial status interferes in the quality of life of individuals with HIV/AIDS because it renders self-care and specific treatments more difficult.\(^9\)

People in poverty live in worse social, environmental, and sanitary conditions. This population also has limited access to general and, mainly, public health services.\(^15\)

The majority of women began the AZT regimen from 14 weeks' gestation; however, some of them did not use AZT. The low adherence of HIV-infected pregnant women in health follow-up is common, and because most of them live outside of the urban areas, they report that transportation and financial difficulties are the causes of missed medical visits.\(^16\)

Many HIV-exposed children remain undiagnosed. Infants whose mothers are HIV-positive receive anti-HIV IgG antibodies during gestation. All children are HIV-positive at birth; those not infected often seroconvert after ages nine and 12 months; however, the test result could be positive up to age 18 years. Children ≥ 18 months old are considered HIV-negative when the test result for the anti-HIV agent is negative, or one negative sample is shown on two HIV quick tests. If different results are found on the two first assays, a third quick test is done; if this later result is negative, the sample is considered a “HIV-negative sample”.\(^5,6\)

Because of the increase in HIV infection in women of childbearing age, the number of children in this risk group has been increasing. For this reason, the Brazilian Health System (SUS, acronym in Portuguese) implemented a project called “Born-Maternities” that aims to increase the number of early diagnoses of VT. The project also offer free antiretroviral treatment and formulas to replace natural breastfeeding.\(^17\) AZT administration within the first 24 hours after birth was reported for 98.5% of moms, which optimized health care of HIV-exposed newborns. However, another study in Fortaleza reported that only 64.4% of children received AZT within the first 24 hours after birth.\(^9\)

AZT is a drug approved by the US Food and Drug Administration (FDA) that inhibits reverse transcriptase and is used for the treatment of HIV-infected adults and children and to prevent transmission from the mother to the child. AZT could also be used in combination with other antiretroviral drugs. SMZ is a bacteriostatic agent that disrupts folate synthesis, hence, in nucleotide synthesis by the bacteria. TMP is also a bacteriostatic agent that acts by folate antagonism.\(^18\)

According to the EAACCC-HIV the ability level of mothers to administer AZT syrup to their children varied from moderate to high; such information shows that they tried to accomplish the task. Research has shown that HIV-positive mothers are afraid to infect their children and they wish not for their baby to be infected; therefore, they follow the antiretroviral treatment regimen.\(^19,20\) In general, these women are afraid that their children are HIV-positive and could become frequently ill because of the virus. This fear is felt until they receive a definitive diagnosis, which is why they make many efforts to adequately administer AZT to the child.\(^20\)

The ability level to administer TMP-SMZ prophylaxis varied from low, moderate, and high. Mothers with more years of education were more able to administer the medicine to their children. Because of the inequality that exists in Brazilian society and the spread of HIV infection throughout the country, the AIDS epidemic has been classified as a women’s disease and a heterosexual disease that mostly affects poor people living outside of the urban areas and also those with older age and lower educational level. All of these factors directly influence the quality of life of HIV-infected people and their families and, most of the time, affecting treatment.\(^21\)
We observed that parity, represented in our study by the number of children having been born, tended to be associated with ability level of administrating TMP-SMZ. Some studies that evaluated families of HIV/AIDS-positive people showed that families with more children have a higher risk of nonadherence to antiretroviral therapy or to other medicines. Such factors could also interfere in the mother’s care during delivery of the child. Therefore, mothers with more children, particularly if they demand more care, could have problems in their routine because they have to care for more children.\(^{(22,23)}\)

For this reason, the benefit of HIV VT prophylaxis with antiretroviral drugs associated with other measures is unquestionable.\(^{(11)}\) Bonding between the parents or caregivers and the child is critical for care and must be based on differential listening and care directed to the life conditions of each patient.

Although not the aim of our study, we believe it is important to mention that several mothers (11.0%) reported discontinuing TMP-SMZ administration because the medicine had run out and they did not have a medical prescription, which required them to wait until the next visit with a pediatrician. They also mentioned that, because of financial difficulties, they were not able to purchase the medicine and use public transportation to access health care service.

Finally, this study could be used as a guideline for health care professionals who need to give instructions to people who care for HIV-exposed children. It is essential that health units be prepared to adequately assist and guide mothers dealing with such circumstances. If nursing professionals and other members of the health care team received proper training on how to care for families with HIV-exposed children, they could offer support regarding child care to these families, considering each family’s social context and characteristics.

In addition, other researchers developing actions contributing to the care of HIV-exposed children are encouraged to improve the quality of life in this population.

### Conclusion

The mother’s ability level to administer AZT syrup (factor I) varied from moderate to high. We did not find significant differences concerning maternal characteristics and ability level to administer medicines. Regarding TMP-SMZ prophylaxis (factor IV) the ability level to administer this drug had no statistically significantly difference among low, moderate, and high. In this study, mothers with higher educational levels were more able to administer the medicines to their child.

### Collaborations

Freitas JG, Cunha GH, Barroso LMM, and Galvão MTG contributed to the design of the study; drafted the paper; and analyzed and interpreted the data. They were also solely responsible for critical analysis and final approval of proofs.

### References


Elderly persons in a situation of dependence: informal caregiver stress and coping

Idoso em situação de dependência: estresse e coping do cuidador informal

Bruno Miguel Parrinha Rocha
José Eusébio Palma Pacheco

Abstract

Objective: Study the relationship between psychological (stress) and psychological (coping) of the informal caregiver of the elderly in a situation of dependence.

Methods: Cross-sectional study involving a sample selected by convenience, of 110 informal caregivers of “Conselho de Faro”, Portugal. Data was collected in the homes by application of four instruments to these caregivers (sociodemographic data, assessment of stress intensity; abbreviated scale of coping and Barthel’s dependence assessment.

Results: The coping strategies centered on the problem (Chi-square = 10.243, p≤0.037) and on the medium (Chi-square = 9.574, p ≤0.048) were used by the informal caregivers of the more dependent elderly. However, strategies centered on the caregiver were those that generated less stress (β = -0.378, p≤0.000).

Conclusion: The “coping strategies centered on the caregiver” are those that generate less perception of stress in the informal caregivers.

Keywords
Nursing; Geriatric nursing; Community health nursing; Caregivers; Aged

Resumo

Objetivo: Estudar a relação entre o estresse psicológico (estresse) e a adaptação psicológica (coping) do cuidador informal do idoso em situação de dependência.

Métodos: Estudo transversal envolvendo uma amostra selecionada por conveniência de 110 cuidadores informais do Conselho de Faro, Portugal. A coleta de dados, realizada nos domicílios, ocorreu por meio da aplicação de quatro instrumentos junto a esses cuidadores (dados sociodemográficos, avaliação da intensidade do estresse, escala de avaliação de coping abreviada e avaliação de dependência de Barthel).

Resultados: As estratégias de coping centradas no problema (Qui-quadrado = 10,243, p<0,037) e no meio (Qui-quadrado = 9,574, p<0,048) foram utilizadas pelos cuidadores informais de idosos mais dependentes. Contudo, as estratégias centradas no cuidador foram as que geraram menos estresse (β = -0,378, p<0,000).

Conclusão: As “estratégias de coping centradas no cuidador” são aquelas que geram menor percepção de estresse nos cuidadores informais.

Conflicts of interest: there are no conflicts of interest to declare.
Introduction

The elderly population is increasing, particularly those over the age of 80 years. Associated with the increase in the average life-expectancy there is the prevalence of chronic diseases and increase in the number of persons in a situation of dependence.\(^{(1,2)}\)

Based on the impressive increase in the number of dependent elderly persons, and in view of the institutional incapability of meet these needs, the informal caregiver has emerged as a key figure in the promotion of quality of life in a situation of dependence. Playing this role is not an easy task and it is accompanied by sociocultural difficulties that go beyond the psychological and physical demands already existent in the activity of informal caregiving.

With respect to the definitions of caregiver and informal caregiver presented by the literature, there are many and not all are unanimous as regards reference to the concepts. In general, when the types of caregivers are specified, the main (or primary) caregiver is defined as the person who has the greatest responsibility in the daily care of the dependent elderly person, performing the majority of day to day tasks; and the secondary caregiver, as the one who performs tasks without much regularity, and without having much responsibility or power of decision, helping the main caregiver only with complementary activities.\(^{(3,4)}\) Secondary caregivers may constitute a relevant source of help to the caregiver.\(^{(5)}\) Moreover, the informal caregiver is distinguished from the formal caregiver, because the former is not remunerated.\(^{(5)}\)

To satisfy all the different concepts of an informal caregiver in order to conduct this study, the main informal caregiver was defined as the person who most closely provides care during most of the time, and who cooperates within his/her possibilities with the activities of life in which the elderly person is dependent, in a non remunerated manner, irrespective of his/her basic educational background or experience of life.

From the perspective of a family caregiver, the situation of having to deal with a dependent elderly person constitutes a situation of crisis, since a significant change occurs in the course of the caregiver’s life.\(^{(6)}\) Therefore, being an informal caregiver constitutes a situation for the assiduous application of the model of stress in which the “care” arises as a stressor agent, something object and that perturbs or threatens the habitual activity of the individual caregiver, which will oblige him/her to seek an adjustment in his/her conditions in the sense of dealing with the situation.\(^{(7)}\)

With respect to the informal caregivers of dependent elderly persons, the success in dealing with situations of stress will depend on coping; that is, they are the strategies each individuals define, which will enable him/her to deal with the situation in a healthy manner, adjusting himself/herself to the adversities and guaranteeing better adaptation to the circumstances.\(^{(8)}\)

Thus there are a high number of coping strategies, and it is considered important that health professionals should be the ones to help caregivers potentiate them, making it possible to use them in an efficient manner. Health professionals must be alert to the symptoms of anguish in caregivers,\(^{(9)}\) as preventing the decline in their mental health is a tool for their greater involvement in care, improving the quality of life of elderly dependent persons.\(^{(10)}\)

The approach to stress and coping of the informal caregiver of elderly persons in a situation of dependence arises, as the overload to which the individual who cares for a dependent person is subjected, is implicated to a large extent in his/her physical and mental health. The changes in the life of caregivers of dependent persons occurs at the level of physical weariness, emotional exhaustion and depression, as well as in the alterations in social, work and economic life.\(^{(4-13)}\)

In spite of this, it is also acceptable to eliminate the premise that caring for a dependent elderly person is mandatorily/necessarily a situation that generates difficulties at the emotional, physical, economic and social levels. Various authors have demonstrated precisely the contrary, and have stated that the activity of caring for a dear one may also be accompanied by rewards of satisfaction\(^{(11)}\) and that beliefs, feelings and positive values are fundamental for one’s quality of life.\(^{(14)}\)

The aim of this study was to study the relationship between the stress of informal caregivers of
elderly persons in a situation of dependence, and their coping strategies.

### Methods

This was a cross-sectional study with 110 informal caregivers of the “Conselho de Faro” - Portugal. A convenience sample was used drawn from data of informal caregivers of users of a home support service. The number of participants of the sample was calculated to meet the minimum number of five participants for each item formulated (n = 5k) to effectuate a factorial analysis of a scale with 22 items, specifically constructed to evaluate the intensity of stress in the informal caregiver.\(^{(16,17)}\)

For data collection, the four instruments mentioned as follows were used: the one for the purpose of collecting the sociodemographic data; that for evaluating the intensity of the informal caregiver’s stress, created and validated for the present study;\(^{(17)}\) the scale of “abbreviate assessment of the informal caregiver’s coping”, validated for the Portuguese population\(^{(2)}\) and the Barthel instrument for assessing dependence, also validated for the Portuguese population.\(^{(2)}\)

The instrument for assessment of stress intensity, developed for conducting the study described, sought to measure the intensity of stress in the degree of frequency from various aspects, on a Likert type scale with six degrees of response.\(^{(17)}\) The intensity of stress was obtained based on the product between degree and frequency.\(^{(16)}\)

To prepare the instrument of psychological evaluation, aspects of methodological strictness, also used by Cardoso and Baptista,\(^{(15)}\) were taken into consideration.\(^{(15)}\)

The first question asked “Indicate your level of stress”, divided into two lines, one in terms of “degree” and the other in terms of “frequency”. The second, asked “to which degree does each of the factors cause you stress?”, presenting ten options for reply, in which the following were evaluated: relationships with the family, with the health technicians, social life, physical and/or emotional effort of taking care of the dependent family member, the time spent on taking care of the dependent family member, planning the future, your economic situation, your privacy, lack of knowledge about care and the attitudes of your family member”. Lastly, a third question evaluated exactly the same factors of stress as the second, but only in terms of frequency.

In the analysis of the item-total correlation, it was verified that there is positive and significant correlation for all the items. The conditions for performing the exploratory factorial analysis were satisfied, as the coefficients of KMO obtained were 0.813 and the Bartlett test of sphericity \(\chi^2(45) = 396,722; p<0.000\). In the exploratory factorial analysis and applying Kaiser’s rule, two factors were obtained.

Factor 1, which was denominated “Stress related to the caregiver’s social and economic life”, comprises the items: “relationships with the health technicians”, “his/her social life”, “planning his/her future”, “his/her economic situation”, “his/her privacy” and “the lack of knowledge about the care of his/her family member”. Factor 2, which was denominated “Stress related to the caregiver’s family life and providing care”, comprising the items: “relationships with his/her family”; “the physical / emotional effort of taking care of his/her family member”; “the time spent taking care of his/her family member”; and “the attitudes of his/her family member”. The Cronbach’s Alpha of this instrument was \(\alpha = 0.85\) (subscale of “stress related to the caregiver’s social and economic life” \(\alpha = 0.777\); subscale of “stress related to the caregiver’s family life and providing care” \(\alpha = 0.775\)).\(^{(17)}\)

The scale for the “abbreviated assessment of the caregiver’s coping”, adapted and validated for the Portuguese population,\(^{(2)}\) is an instrument developed to find out the way caregivers deal with the difficulties perceived in a perspective of coping strategies, by means of a Likert type scale with four options of response and 26 items (\(\alpha = 0.94\)) composed of six subscales (subscale of “strategies centered on providing care” \(\alpha = 0.81\); subscale of “perceptions of alternatives about the situation” \(\alpha = 0.76\); subscale of “strategies centered on the problem” \(\alpha = 0.62\); subscale of “strategies centered on the caregiver” \(\alpha = 0.63\); subscale of “strategies centered in the medi-
um” $\alpha = 0.72$; and subscale of “strategies centered on sharing of the problem” $\alpha = 0.55$).

The goal of the Barthel instrument for assessing dependence is to evaluate the basic activities of daily life, ranging between “0” (totally dependent) and “100” (independent), presented a value of $\alpha = 0.89$.(2)

The caregivers were approached in their homes, where the object of the study and the predicted duration of data collection were explained to them, they were asked to authenticate their informed consent to participate on the front page of the form. Data collection, constituted of the above-mentioned four instruments, was applied by the investigator only to the main informal caregiver, out of the hearing and sight of third parties.

Data analysis was performed in the computer software application Statistical Package for Social Sciences, version 15.

The study was developed in compliance with national and international rules of ethics in research involving human beings.

Results

The majority of caregivers of elderly persons (89.1%) were over 50 years of age, with a mean (M) age of 64.29 years being verified, with a standard deviation (SD) of 11.18 years, ranging between 26 and 85 years. Of the 110 caregivers under study, 12.7% were men with a mean age $\rightarrow 68.57$ (SD $\rightarrow 13.91$) years, ranging between 48 and 85 years, and 87.3% women with a mean age $\rightarrow 63.67$ (SD $\rightarrow 10.67$) years, ranging between 26 and 85 years.

The participants’ educational level varied, however, it is pointed out that 67.3% had 4th grade elementary schooling, or less. The mean value of the number of years of schooling was 5.85 (Median = four) years, ranging between zero and 17 years of schooling.

With reference to the variables of formal and informal help of the informal caregivers, it was found that 58.2% received help from secondary caregivers.

In the sample, there was 14.5% of formal help provided by private persons; 16.4% by Private Institutions of Social Solidarity, and in over 90% there was home nursing support from the National Health System. Of the 110 caregivers, 35.5% admitted having had past experience of caring for someone.

As regards the age if the dependent persons, it was verified that 72.7% were of an age equal to or greater than 80 years, M $\rightarrow 82.72$ (SD $\rightarrow 6.56$) years, ranging between 65 and 97 years, with a varying degree of dependence, and mean score of 25.27 (Median $\rightarrow$ ten), ranging between score zero and score 95 on the Barthel scale, thus 71% of the elderly in the study were completely or severely dependent.

Of the sample, the percentage of elderly persons who presented bodily lesions was 31.8%.

Having characterized the participants, the description will now be given of the manner in which stress and coping are related with the remaining variables under study.

Attending to the causes of stress, it was verified that the variable stress related to family life and providing care (M $\rightarrow 14.75$; SD $\rightarrow 6.55$ points) was that which caused the greatest intensity of stress (MP $\rightarrow 18.5$ points). The variable stress related to social and economic life (M $\rightarrow 9.22$; SD $\rightarrow 8.38$ points) was that which generated the least intensity of stress (MP $\rightarrow 18.5$ points) (Chart 1).

The statistical analysis of stress about the existence of bodily lesions demonstrated a positive relationship both for stress related to the caregiver’s social and economic life (Chi-square $\rightarrow 13.766$, p$\leq0.000$) and for stress related to the caregiver's family life and providing care (Chi-square $\rightarrow 6.060$, p$\leq0.014$).

Whereas, the analysis between the intensity of stress and the existence of informal help demonstrated that these are positively related to stress with reference to the caregiver's social and economic life (Chi-square $\rightarrow 4.373$, p$\leq0.037$).

With respect to the coping strategies, the “strategies centered on providing care” (M $\rightarrow 3.25$; SD $\rightarrow 0.58$ points) and the “strategies centered on the problem” (M $\rightarrow 3.25$; SD $\rightarrow 0.64$ points) were those most used by the caregivers (MP $\rightarrow 2.5$ points). Those least used were the “strategies centered on sharing the problem” (M $\rightarrow 2.75$; SD $\rightarrow 0.87$ points) (Chart 1).
With regard to the coping strategies, the existence of a relationship between these and the caregivers’ educational level was verified, by which the “alternative perceptions about the situation” ($\beta = -0.321$, $p \leq 0.001$) and the “strategies centered on the problem” ($\beta = -0.223$, $p \leq 0.015$) are those that are related with a low level of schooling. Whereas the “strategies centered on the medium” were those most used when the educational level was higher ($\beta = 0.274$, $p \leq 0.004$).

When coping was related to the family group income, it was only statistically significant for the “strategies centered on the medium” (Chi-square = 10.972, $p \leq 0.027$), by which intervening in the medium is more related to those who have higher incomes.

When analyzing the strategies of those who had past experience in the caregiving activity, it was verified that these persons tended to use the “alternative perceptions about the situation” (Chi-square = 4.840, $p \leq 0.028$) and the “strategies centered on the caregiver” (Chi-square = 3.961, $p \leq 0.047$), as the strategies of choice.

When the level of dependence of the elderly persons was higher, the caregivers tended to use “strategies centered on the problem” (Chi-square = 10.243, $p \leq 0.037$) and “strategies centered on the medium” (Chi-square = 9.574, $p \leq 0.048$).

As regards the informal caregivers’ coping strategies in relation to the perception of the intensity of their stress, it was verified that the “strategies centered on the caregiver” were those that were related to less perception of the total intensity of stress by the informal caregiver ($\beta = -0.378$, $p \leq 0.000$).

When the relationship is made with the two factors of stress, the “strategies centered on the caregiver” were those that were related to less perception of the intensity of stress in relation to the informal caregiver’s social and economic life ($\beta = -0.387$, $p \leq 0.000$), and with total stress and that related to the caregiver’s family life and providing care ($\beta = -0.205$, $p \leq 0.040$). Also efficient with respect to this latter variable, were the “alternative perceptions about the situation” ($\beta = -0.257$, $p \leq 0.012$). On the contrary, the “strategies centered on sharing the problem” are related to an increase in the perception of this type of stress ($\beta = 0.235$, $p \leq 0.011$) (Figure 1).

![Figure 1. Relationship between coping strategies used and the intensity of stress in informal caregivers of elderly persons in a situation of dependence](image1)

**Discussion**

The limit on the results was the sample size ($n = 110$) and by the method of selection by convenience, motivated by the difficulty of getting to know the caregivers.
It was verified that a large proportion of the caregivers were women, which is in agreement with related studies.\(^2,3,6,12\)

With regard to help received from others, almost half of the caregivers did not have informal support provided by family members, friends or neighbors, and around one third of the sample had past experience in the activity of caring for someone dependent, which tends to be a task of long duration that may last for years. Figueiredo\(^5\) affirms that anyone who has previously cared for someone, tends to care for another person, with this phenomenon being designated “serial caregiver”.

It was found that the existence of bodily lesions in the elderly person has a negative impact on the informal caregiver’s social life. Imaginario\(^11\) mentions that one of the priority needs felt by informal caregivers a is the issue of technical situations, namely wounds. Although there are few direct studies that relate wounds to caregivers’ stress, pressure ulcers tend to diminish the quality of life of dependent persons and caregivers,\(^13\) future studies must be conducted and may be important to clarify the subject.

Another finding was the fact that secondary informal caregivers also constitute a relevant source of stress to primary informal caregivers. Essentially, the literature demonstrates the opposite, that the socioemotional support of the family constitutes an important resource for the feelings of personal appreciation of caregivers\(^5\) and that the lack of a secondary caregiver favors their overload.\(^11\) However, when a caregiver assumes the role of caregiver, the other potential caregivers may exempt themselves from the responsibilities, thereby increasing the feeling of inequality among them.\(^6\) These divergences in consensus justify future investments in study about this question in particular.

It was verified that a high educational level and income are related to strategies oriented towards problem solving. A higher educational level allows the development of practical capacities, namely more knowledge and social resources.\(^12\)

A low educational level is related to “strategies centered on sharing the problem” and “alternative perceptions about the situation”. Whoever has greater experience in the activity of providing care adopts the “strategies centered on the caregiver” and “alternative perceptions about the situation” as being the most effective. Sequeira\(^2\) added that in view of the complexity of the problem and the difficulty of finding a complete solution, the strategies of avoidance are more successful because they reduce expectations and consequently, the eventual frustrations, protecting caregivers from high levels of anxiety.

When the elderly person’s dependence increase, the strategies oriented towards the problem and medium also tend to increase, among which seeking help is included, in the sense of suitting the informal caregiver’s life to the situation of providing care on the way to adaptation.

The “strategies of coping centered on the caregiver” are more efficient in the management of the intensity of total stress; stress related to the informal caregiver’s social and economic life. Whereas stress related to family life and providing care is minimized when “strategies centered on the caregiver” and “alternative perceptions about the situation” are used, and intensified with the “strategies oriented towards sharing the problem”. Therefore, the caregiver must be instructed to accept the situation as it is, perform activities other than providing care, remember the good times, live one day at a time, look for the positive side of situations, and not blame persons or situations. It is questionable to think about whether this conformist thinking could have negative implications for the mental health of caregivers in the medium or long term, and here lies the fundamental role of the nurse in guiding the caregiver, so that he/she will be in a condition to face up to his/her problem with confidence.

The literature also reinforces the importance of the caregiver adopting a protective philosophy about his/her meaning of life, reinforcing positive values\(^14\) and that strategies of avoidance are more effective in situations that are difficult to resolve, and that the caregiver must reserve some time for himself/herself to prevent caregiver from becoming overloaded.\(^10\)

Thus it was verified that there is a potential in nursing care that may have implications for the qual-
Elderly persons in a situation of dependence: informal caregiver stress and coping

It is recommended that the informal caregiver should initially be instructed to seek strategies centered on the medium and problem, making available the necessary support and resources, in the sense of preparing the entire environment around the objective of providing care (physical environment and products of support, formal and informal human resources of support, training of caregivers). When this initial stage of disorganization and reorganization has passed, it would be important to instruct the caregiver to maintain his/her activity from the perspective of a chronic activity, adjusting his/her expectations to achievable goals and adapting him/herself to the situation, and for this purpose, using strategies oriented towards the caregiver and alternative perceptions about the situation.

As regards the difficulties in conducting this study, the need for performing data collection in the homes of users/caregivers is pointed out, as this visit could have been felt to be an invasion of privacy, in addition to an approach to a subject to about which the informal caregiver may feel sensitive. Part of the difficulty was initially related to establishing confidence, because not all the caregivers knew the investigator, although they knew that they would be contacted. In addition the low educational level and the sensorial limitations of the older caregivers were factors that obliged one to make a careful approach, so that one could be sure that the response would effectively be the answer to the question.

Conclusion

It was concluded that the “strategies of coping centered on the caregiver” are those that generated the least perception of stress in the informal caregivers.

Collaboration

Rocha BMP and Pacheco JEP declare that they contributed to the conception and Project, analysis and interpretation of data; writing the article, critical review of the intellectual content and final approval of the version to be published.

References

Polymyxin B: dose and time dependent nephrotoxicity effect in vitro

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Abstract

Objective: To characterize the toxicity of polymyxin B (PmxB) in renal cell in different dosage and times.

Methods: LLC-PK1 cells grown in 12 well multiwell plates were divided into the following groups: Control (CTL) - cells maintained in DMEM supplemented with 5%; G1 - cells exposed to concentration of 75µM PmxB; G2 - cells exposed to concentration of 375µM PmxB. Each group was assessed at 24, 48 and 72 hours as for cell viability (Acridine orange/ethidium bromide) and apoptosis (Hoechst 33342).

Results: The data demonstrate the cell viability and apoptosis exposure of three doses of PmxB in three time intervals, with a significant increase in toxicity to high doses and longer duration of stay in the antibiotic to apoptosis.

Conclusion: Cytotoxicity by PmxB in cell culture model, showed to be time and dose dependent, increasing with increased exposure and higher dose of antibiotic.

Keywords
Polymyxin B; Acute kidney injury; LLC-PK1 cells; Apoptosis

Resumo

Objetivo: Caracterizar a toxicidade da polimixina B (PmxB) em células renais em dosagem e tempos diferentes.

Métodos: Células LLC-PK1, cultivadas em placas multiwell de 12 poços, foram divididas nos seguintes grupos: Controle (CTL) - células mantidas em meio DMEM suplementado a 5%; G1 - células expostas à concentração de 75mM de PmxB; G2 - células expostas à concentração de 375mM de PmxB. Cada grupo foi avaliado nos tempos de 24, 48 e 72 horas quanto à viabilidade celular (Acridine orange/ Brometo de Etídio) e apoptose (Hoechst 33342).

Resultados: Os dados demonstraram a viabilidade celular e a apoptose à exposição de três doses de PmxB em três intervalos de tempo, com um aumento significativo da toxicidade à elevação das doses e ao maior tempo de permanência no antibiótico para apoptose.

Conclusão: A citotoxicidade pela PmxB, no modelo de cultivo celular, se mostrou tempo e dose dependente, aumentando com a maior exposição e maior dose de antibiótico.

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Polymyxin B: Dose and Time Dependent Nephrotoxicity Effect in vitro

Introduction

Recent epidemiological studies relate nephrotoxic drugs with 19% to 25% of cases of acute kidney injury (AKI). The applicability of potentially nephrotoxic agents in the hospital environment is inevitable, due to the increasingly frequent occurrence of multidrug-resistant bacteria. Another problem relates to the fact that the nephrotoxic acute kidney injury is underestimated as a factor and possibly modifiable causes of AKI.

Among the nephrotoxic agents, the ones from the group of polymyxins stand out. From the five (polymyxins A, B, C, D and E), only polymyxin B (PmxB) and polymyxin E have been used in intra-hospital environment. It is worth noting that polymyxin E presents a lower nephrotoxic potential than PmxB, in contrast, the bactericidal action of PmxB is more expressive.

The composition of polymyxin B sulfate, also known as polymyxin B or Aerosporin, consisting of a mixture of sulfates of polymyxin B₁ and polymyxin B₂. As it acts on the cytoplasmic membrane, the PmxB compromises the osmotic properties and transport mechanisms of the cell membrane, as the composition of this structure in bacteria and human cell is similar.

This antimicrobial agent may be accumulated in various organs and tissues such as kidney, liver, brain, lungs, heart and muscles for a period of five days. Since the excretion of this pharmacological agent occurs primarily by the kidneys, where 60% of the drug can be found in urine. In the event of renal injury, its half-life may be increased to two or three days. Nephrotoxicity, neurotoxicity and hypersensitivity reactions constitute as main characteristic toxic effects.

Experimental studies have demonstrated that the flat portion of the proximal tubule (segment S3) is the most susceptible to ischemic lesion or nephrotoxic. The cells in this part of the nephron lose tubular brush border normal and undergo extensive cellular necrosis. The proximal tubular cells of the cortex (segments S1 and S2) are less susceptible to injury, less necrosis was observed in the cells of the S3 segment. Despite the frequent use of the term necrosis, apoptosis, another mechanism of cell death, is also present in cellular injury of ischemic and nephrotoxic AKIs. Moreover, histological data showing the concrete necrosis in kidney tubules are not available yet. This assumes that its manifestation and sparse variable are responsible, in part, for precipitated functional damage in AKI.

The renal tubular cells have potential reactions to renal injury. A sub-lethal cell injury may lead to cellular dysfunction, altered gene expression, the cell dedifferentiation and, finally, the recovery of cell function.

The lethal cell injury, in the case of AKI, when not restored homeostasis can lead to necrosis and apoptosis. The morphological characteristics as well as mechanisms that involve processes of necrosis and apoptosis are considerably different.

In the AKI, apoptosis and necrosis may be caused by the same cytotoxic events. It seems clear that apoptosis is a response to injury of damaged cells which undergo a short ischemia or toxins at low concentrations compared to those that induce rapid metabolic collapse and necrosis. Some studies demonstrate that the mechanism of renal tubular cell death seems to depend on the severity of the injury.

In an attempt to simulate nephrotoxic effects of this drug in vitro, LLC-PK, cells, proximal tubular epithelial cells were strain of choice. Obtained from the Hampshire pig, they have many renal epithelial morphology as apical microvilli, tightjunctions, wraps the basolateral membrane. They also feature a predominantly proximal phenotype, constituting thus a safe model to assess nephrotoxicity.

Organisms increasingly multiresistant to conventional antibiotics has led to the rescue of PmxB which has taken a Pharmacotherapeutic important role in recent years, and not surprisingly, already manifest adverse effects similar to well-established drugs in the clinic. This combination of facts justify studies like these that developed nephrotoxicity experiments with PmxB. Given these considerations, the aim of this study was to characterize the toxicity of PmxB in renal cells.
Methods

Experimental quantitative in vitro study conducted by the Laboratory of Experimental Animal Model of School of Nursing, University of São Paulo (LEMA - EEUSP) and in the laboratory of Cell and Molecular Biology in the Department of Nephrology, Federal University of São Paulo (UNIFESP).

LLC-PK₁ cells were used, a line of proximal tubular epithelial of pig, passage 40, obtained from the American Tissue Collection (ATCC), which were taken from a nitrogen container, thawed and maintained in culture bottles containing Dulbecco's Modified Eagle's Medium (DMEM) with 5% fetal bovine serum (FBS).

LLC-PK₁ cells grown in 12 multiwell plates were divided into the following groups: Control (CTL) - cells maintained in DMEM supplemented with 5%; G1 - cells exposed to concentration of 75µM polymyxin B, G2 - cells exposed to concentration of 375µM polymyxin B. Each group was assessed at 24, 48 and 72 hours for cell viability and apoptosis.

Proximal tubular cells were grown in culture bottles 25cm², 75cm² or 12 multiwell plates according to the experimental protocol, in Dulbecco's Modified Eagle's Medium (DMEM) supplemented with fetal bovine serum (FBS 5% v/v), NaHCO₃ 2.0 g/L, HEPES 2.6g/L, penicillin 10,000 IU/L, streptomycin 50mg/L neomycin and 100mg/L and kept in incubator at 37°C with 95% air and 5% CO₂. Once they had reached 80% of confluence, cells were detached from the flask by trypsinization and neutralized trypsin activity with DMEM containing FBS. Cells were used for the maintenance of the cultures or for conducting experimental protocols, each protocol was repeated at least eight times. Cells stocks were frozen at passage 40 for maintaining a constant uniformity in the experiments.

Cell viability was determined by exclusion of fluorescent dyes acridine orange and ethidium bromide (100 µg/ml), in a ratio v: v (1:1). The method of viable cell count is based on the selective uptake of the fluorescent dyes mentioned, which is dependent on membrane integrity. Ethidium bromide passes through the intact membrane, by binding to cellular DNA, and emitting green fluorescence (excitation 460nm and emission 595nm) indicating cells are viable. The acridine orange stains RNA but it does not fully pass through the membrane and is picked up only by cells whose membrane have been damaged in color and fluoresces red-orange (excitation 510 nm and emission 595 nm) showing which cells are not viable (necrosis). At the end, at least 200 cells were counted for each representative group through a fluorescence microscope (magnification 40x and 200). Results were expressed as percentage of viable cells.

This assessment of apoptosis is the morphological method, quantitative Hoechst 33342 [Bis-benzimide HOE 33342 (2’-[4-ethoxyphenyl]-5’-[4-methyl-1-piperazinyl]-2’,5’-bi-1H-benzimidazole trihydrochloride)], which is a dye specific for adenine - thymine. This dye is easily absorbed by the cell, staining the DNA, chromosomes and nucleus, enabling visualization of apoptotic bodies for fluorescence microscopy in intense blue coloration. For the evaluation of apoptosis solution a 100 µg/mL Hoescht dye 33342 in PBS was prepared. The cells were subjected to the same preparation described for the viability assessment, to obtain the cell pellet. On the blade 5µL of Hoescht 33342 added to 5 µL of cell suspension were pipetted. The blade was stored for 10 minutes at environment temperature and in the absence of light, to chromatin staining. The procedure was then the count of 100 to 200 cells for each group. Results were expressed as percentage of apoptotic cells compared to total cells.

The statistical methodology applied consisted of analysis of variance-ANOVA. In this model, all interactions were tested. When detected differences, there were multiple comparisons through the Bonferroni test and Tukey test. The descriptive statistics with p ≤ 0.05 were considered significant. Data were defined as mean ± standard error and they will be presented in the tables below.
Results

The data in table 1 demonstrate cell viability of exposure to two doses of PmxB in three time intervals, with a significant increase in toxicity with increasing levels within 24 hours, in 48 hours and in 72 hours.

Table 1. Viability of LLC-PK1 cells in response to treatment with Polymyxin B

<table>
<thead>
<tr>
<th>Groups (µM)</th>
<th>n</th>
<th>24</th>
<th>48</th>
<th>72</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTL</td>
<td>8</td>
<td>80.7±3.4</td>
<td>80.9±1.9</td>
<td>81.4±5.8</td>
</tr>
<tr>
<td>G1</td>
<td>8</td>
<td>57.6±7.7a</td>
<td>56.9±8.1a</td>
<td>56.9±2.9a</td>
</tr>
<tr>
<td>G2</td>
<td>8</td>
<td>41.0±6.7ab</td>
<td>41.3±9.7ab</td>
<td>40.9±2.0ab</td>
</tr>
</tbody>
</table>

Legend: CTL = 0µM; G1 = 75µM; G2 = 375µM; p < 0.05 vs CTL - 24h/48h/72h; p < 0.05 vs G1 - 24h/48h/72h

Table 2 presents the data of cell apoptosis LLC-PK1exposed to the groups and times previously mentioned. Raising the dose (group) increased the population of cells undergoing apoptosis within 24 hours, 48 hours and 72 hours. This demonstrates that the cellular response was the same with increasing dose PmxB: more cells died by apoptosis. In general, it was observed significant difference at all times which demonstrates greater toxicity because as the exposure time and the dose of PmxB are increased, larger number of cells undergo apoptosis.

Table 2. Apoptosis of LLC-PK1 cells in response to treatment with Polymyxin B

<table>
<thead>
<tr>
<th>Groups (µM)</th>
<th>n</th>
<th>24</th>
<th>48</th>
<th>72</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTL</td>
<td>8</td>
<td>4.5±1.2</td>
<td>8.6±5.3</td>
<td>8.9±2.1</td>
</tr>
<tr>
<td>G1</td>
<td>8</td>
<td>20.7±2.4a</td>
<td>24.9±2.6a</td>
<td>28.0±2.7ac</td>
</tr>
<tr>
<td>G2</td>
<td>8</td>
<td>29.9±2.6ab</td>
<td>32.7±3.1ab</td>
<td>36.1±3.8a</td>
</tr>
</tbody>
</table>

Legend: CTL = 0µM; G1 = 75µM; G2 = 375µM; p < 0.05 vs CTL - 24h/48h/72h; p < 0.05 vs G1 - 24h/48h/72h; p < 0.05 vs G2 - 24h

Discussion

The results show that the cytotoxic effect of PmxB was intensified with increasing dose of this drug. This finding was confirmed since the LLC-PK1 cells showed reduced viability when subjected to an increasingly high dose of PmxB. Conversely, with increasing dose of antibiotic the population of apoptotic cells increased, demonstrating how a cell reacts to the toxic effect of the injury, ie the presence of a biological phenomenon increasing the injury is also greater. Vitro models that mimic the PmxB toxicity in kidney cells are not common. Its mechanism of action in acute kidney injury is unclear. (1) Due to the inconclusive clarifications regarding cellular mechanisms involved in the genesis of this side effect, this research, through techniques of immortalized kidney cell culture, evaluated the effects of PmxB.

These findings confirmed the toxic dose dependent effect of this antibiotic, which in practice may be assumed that a high inhibitory concentration as a therapeutic measure may be a risk factor for renal cell death with eventual functional outcome.

Besides the dose, the time of drug permanence in cells influenced cell death mechanism. The longer time the cells were exposed to toxicity of polymyxin, the bigger number of apoptosis was observed.

It has been suggested that the mechanism of the nephrotoxicity PmxB is a consequence of increased cell membrane permeability, resulting in increased influx of cations, anions and water, leading to edema and cell lysis. (9) PmxB acts on the plasma membrane of the bacteria, impairing transport mechanisms. Its actions are not selective, it may also act at the cell membrane of other organisms. Its therapeutic effect depends on the minimal inhibitory concentration for the infecting bacteria. (10)

Nephrotoxicity of PmxB is an infrequent clinical problem in patients with adequate renal function and is related to the dose of this drug. (10) Studies on topical or parenteral use of PmxB in daily doses of 2.5mg.kg-1 caused proteinuria, hematuria and formation of cylinders in some cases. (10,11)
Evidences show that the bactericidal action of PmxB seems to be more effective in vitro than in vivo, so it is advised that during parenteral therapy serum levels are assessed and maintained below 10 mg.1-1.10

A recent study performed in an intra-hospital environment with 60 patients investigated with more emphasizes its nephrotoxic effect. The following criteria were considered: demographic characteristics, underlying diseases, infection environments, microorganisms, length of stay, PmxB dosage, frequency and duration of dose, other administered medications, serum creatinine, development of neurological and skin alterations, and microbiological and clinical results. The overall mortality rate was 20%. Among patients who developed renal injury, the mortality rate was 57%, and the mortality rate of patients who did not develop renal injury was 15%. From the group who developed kidney injury, three survived; from these two restored renal function and one required renal replacement therapy. Contradicting earlier studies where ratios nephrotoxicity ranged from 17-100%, the PmxB was well tolerated by most patients, of which 14% developed nephrotoxicity. Its application has provided clinical and microbiological efficacy, with less impairment of renal function.12

Another study on PmxB reemphasizes its nephrotoxicity, but provides a new approach to this antimicrobial drug. Endotoxin is a lipopolysaccharides (LPS) found in the outer membrane of gram-negative bacteria. The PmxB binds to endotoxin neutralizing its activity, which includes cell death. The PmxB is a nonapeptide derived from PmxB which controls anti-lipopolysaccharides activity, but with less toxic characteristics. In this experimental study, dogs which were given high doses of PmxB showed hyperthermia, abdominal and facial flushing, and increased urea nitrogen and serum creatinine. Such changes were not observed in control animals or those receiving equal dose of PmxB nonapeptide. Sprague-Dawley rats which received doses of PmxB developed dyspnea, cyanosis, decreased physical activity and ataxia. In the control group or the group that was administered to PmxB nonapeptide these changes were not recorded. Importantly, the PmxB nonapeptide has no antibiotic activity, but is able to disrupt the membrane of gram-negative bacteria, showing that the chemical structure of the antimicrobial effect of dissociated PmxB is showing to be related to its toxicity.13

It is important to emphasize that the detection of apoptosis in the model developed here standardizes toxicity induced PmxB. Apoptosis is a coordinated event that acts in physiological processes such as tissue homeostasis, embryonic development and immune response. The mitotic cycle and apoptosis have similar characteristics. Therefore, the study and understanding of this phenomenon in ischemic and nephrotoxic AKI can provide directions for efficient prevention or recovery.

It should be noted that success in the prevention of AKI requires knowledge of the mechanisms pathogens involved, the identification of individual risk factors and measures of pre-emptive associated with surveillance and early intervention. In this context models to encourage research on the cellular changes involved in functional disorder precipitated by nephrotoxins such as PmxB.

This research will enable the Nursing to correlate basic research to clinical research allowing this professional a more enhanced biological, physiological and pathological understanding of mechanisms that affect the nephrotoxic AKI by PmxB, besides the establishment of nephroprotection preventive measures.

The present study will enable the establishment of protocols for in vitro models; recognition model of nephroprotection from techniques of molecular and cell biology; interpretation of molecular, cellular and pathophysiological events of nephrotoxic AKI from studies with cell cultures; early identification of clinical situations that influence the occurrence of renal dysfunction; understanding of used therapies in the treatment of patients with renal dysfunction; identification of risk factors related to the occurrence of AKI by nephrotoxic PmxB; elaboration of preventive measures for AKI by PmxB and establishing Clinical strategies to minimize the occurrence of AKI Nephrotoxic by PmxB.
Conclusion

The PmxB confirmed its cytotoxic effect in LLC-PK₁ cells, triggering a reduction in viability and increase in apoptosis as it increased the time and dose of the antibiotic. Cytotoxicity by PmxB in cell culture model, showed time and dose dependency, increasing time exposure and higher dose of antibiotic.

Contribution

Neiva LB; Fonseca CD; Watanabe M and Vattimo MFF participated in the conception and design, analysis and interpretation of data, drafting the article and revising it critically for important intellectual content and final approval of the version to be published.

References

Meaning of workload on the view of cleaning professionals

Significado de cargas no trabalho sob a ótica de operacionais de limpeza

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Abstract

Objective: To analyze the meaning of workload for cleaning professionals working in an emergency unit and identify strategies to protect themselves against workloads.

Methods: This is an exploratory and descriptive study of a qualitative approach that included 12 cleaning professionals. We conducted data collection using semistructured interviews and speeches that we analyzed in the following steps: reading, definition of recording and meaning units, codification and classification, management, and interpretation of results.

Results: Three categories that appeared were loads experienced in the work related to internal materiality, load experienced in the work related to external materiality, and strategies used to lighten and/or prevent workload.

Conclusion: Professionals recognized partial loads that they were exposed. In addition, they faced all loads separately.

Keywords
Occupational health nursing; Nursing; Nursing service, hospital; Housekeeping, hospital; Workload

Resumo

Objetivo: Analisar o significado das cargas de trabalho para operacionais de limpeza de uma unidade de Emergência/Pronto Socorro e identificar as estratégias que eles utilizam como proteção as essas cargas.

Métodos: Estudo descritivo, exploratório qualitativo, com a participação de 12 operacionais de limpeza. A coleta de dados foi realizada por meio de entrevistas semiestruturadas e as falas submetidas à análise de conteúdo em suas etapas: leitura, determinação das unidades de registro e significações, codificação e classificação; tratamento e interpretação dos resultados obtidos.

Resultados: Emergeram três categorias: carga vivenciada no trabalho relacionada com a materialidade interna, carga vivenciada no trabalho relacionada com a materialidade externa e estratégias de enfrentamento utilizadas para amenizar e/ou prevenir as cargas no trabalho.

Conclusão: Os profissionais conhecem parcialmente as cargas as quais estão expostos e enfrentam-nas individualmente.

Conflicts of interest: the authors have no relevant conflicts of interest to disclose.
Meaning of workload on the view of cleaning professionals

Introduction

Working constitutes a vital activity for human beings. It is performed within a social context influenced by several factors and is also related to continuous actions between workers and ways of production. Therefore, inside this mutual change it is possible to consider working as the source for self-achievement from a professional standpoint, the way to build a wealth and acquire material goods besides the feeling of making a difference for society as a whole, among others. However, working can cause physical, mental, and social distress; injury to one’s health; or even death.

In the 1980s, a load concept different from the concept of risk was instituted and enabled “[…] a analysis of the working process that extracted and synthesized elements which determined the importance of working community biopsychosocial nexus and gives them a specific historical way of going forward in life.”(1)

Workloads interact at the same time, and to analyze work actions in the context in which they occur is necessary, and also consequences from this context.(1,2)

The load concept of work seeks to reveal all factors that determine the work process such as technological resources, organization and sharing of activities, interpersonal relationships, relationship with the environment and physical structure, among other factors that could overload the professionals, his/her work, ability and may destroy their vital energy.(1,3)

Workload could be grouped according to its nature and basic characteristics. They are subdivided into those with external materiality, that is, modified after interaction with a body – physical, chemical, biological, and mechanical, and those with internal materiality that interact in own body being internally expressed by the individual, such as psychological and psychics.(1,4,5) Therefore, a coexistence of different ways as a model to social determination of disease that represent a retaken of social epidemiological approaches.(1,4)

Workloads are classified in specific types that also comprise specific risks. However, it does not mean that it is simply the sum of risks because they acquire meaning from the global dynamic of work process. (4)

Physical loads are related, for example, to noise that acts on ear the cells and central nervous system, heat that activates a thermoregulation mechanism and enables changes in the physiological process. This category includes humidity, ventilation, vibration, and lighting. Chemical loads originate mainly from dust, smoke, fibers, vapor, liquids, and radiation. Biological loads could be caused by any vegetable or animal organism and are referent microorganisms.(1,4)

Mechanical loads involve technology, installation conditions, and a maintenance process of production object of the work itself. Hence, work accidents occur mainly by mechanical loads (contusions, wounds, fractures) and are more visible.(1,4,5)

Concerning physiological loads, there are several ways to perform a work activity, such as physical and visual efforts (increased caloric consumption, blood redistribution, energetic waste), performance of the task in a physically uncomfortable position, and shift changes (rupture of basic physiological rhythms as circadian cycle.(4,5)

Psychic loads that are directly related to management of journey, work dangerously, frequency of emergent situations, degree of responsibility in solving problems, rhythm of work, possibility to speak with the work team, taking actions and making decisions, tasks receptivity. These situations constitute elements of the work process that might damage workers’ health.

Workloads beyond each work own characteristics are also the result of interaction between tasks requirements, circumstances in which interactions occur, workers’ skills, abilities, behaviors, and perceptions of their own and others expectations.(5) Therefore, when studying these loads, an important assessment is to determine how work is perceived by professionals.

In this context, to understand better work processes of hospital cleaning professionals is critical for occupational nurses to define prevention strategies.

In daily loads, workers who clean hospital institutions have contact with secretions, fluids, chemi-
cal substances, and high-risk patients. This environ-
ment needs specific competencies to perform activ-
ities and also requires a constant concern with safety
to avoid accidents and damage to the mental and
physical health of the worker.(6) Considering these
facts, the following questions are raised:

How do cleaning professionals working in
emergency units understand the workload?

What loads are identified in this type of work?

What measures are taken to protect profession-
als against these loads?

Answers to these questions are relevant to work-
ers understanding their workloads and, as a result,
the strategies that could be adopted to prevent dis-
ease and damage to their health.

This study aimed to analyze the meaning of
workload for cleaning professionals working in the
emergency unit of a hospital and identify strategies
to protect against workload.

Methods

This is an exploratory and descriptive study of
a qualitative approach that included 12 cleaning
professionals working in the emergency unit at
the Hospital Público de Londrina, Paraná, Brazil.
Cleaning professionals in the institution where
the study was conducted report to the nursing
director and are coordinated by responsible nurs-
es of units.

We decided to conduct the study in an emer-
gency unit because the emergency unit is the first
place where most patients are admitted and con-
stitutes an environment full of unexpected events
and intense and dynamic activities involving all
professionals who work there, therefore requiring
competence and agility. The unit has 18 cleaning
professionals. In the study, 12 cleaning profes-
sionals were selected because they met inclusion
criteria, which were employment in the unit for
at least 1 year and agreement with participation.

Exclusion criteria were workers who were on
vacation. This study was a qualitative research
study,(7) and the number of participants was not
based on criteria or number of representatives.

Interviews were performed until the moment
that occurred convergence in speech related to
phenomenon studied.

We collected data using interviews that were
performed in a private environment at the profes-
sionals’ workplace from December 2010 to April
2011. To assure data reliability, we recorded inter-
views, which lasted on average for 45 minutes, with
the participants’ approval. To preserve confiden-
tiality, we identified participants according to letter A,
B, C, and so on. A semistructured form was used in
the interviews. To reveal the objective of this study,
we used the following questions:

How do you understand workloads?

What workloads do you perceive in your work?

What strategies and measures do you use to deal
with loads?

For analysis of results, the content analysis
 technique(7) was used in thematic modality in
which the following steps were used: reading,
definition of recording and meaning units, codi-
fication and classification, management, and in-
terpretation of results. After skimming reading,
we could perform marks in recorded units and
organize them by themes. Categories were built
using approximation and distance.

Using these techniques, the elements that
build workload for participants originated in the
theme categories of internal and external mate-
riality and strategies of confrontation. Loads of
internal materiality are not dependent on worker
body; therefore, they could be revealed and
even be measured without involvement. Intern-
al materiality is linked to an intrabody process
and acquires materiality through corporality.(1,3,4)
Strategy categories of confrontation revealed sub-
jective and nonsubjective actions.

This study followed the national and international
ethical and legal aspects of human subject research.

Results

Participants had the following personal and
occupational characteristics: they worked in a
shift scheme. Eight (66.65%) were women, and
four (33.4%) were men; age range was 30 to 58 years old. Half of the workers were between 30 and 40 years old, two (16.6%) were 40 to 50 years old, and four were 50 to 58 years old. Concerning the duration of service in the unit, five (41.6%) of the workers had more than 20 years of service, four (33.4%) had less than two years, and three (25%) had between three and four years of service. All participants had completed high school.

Workers on the day shift worked six hours daily with a weekly duty of 12 hours, those working on the night shift worked on 12/36 duty hours. Basically, their duties were to clean the floors, beds, and furniture, among others. During activities, professionals used hospital cleaning products and wore the recommended protective equipment such as gloves, masks, goggles, boots, and uniforms. Testimonial analysis included the following categories:

1. Load experienced in the workplace related to internal materiality

Participants reported their physiological loads:
- [...] my greatest load is back pain (J).
- I feel back pain, and my bursitis appears (I).

Respondents reported psychological loads caused by suffering for other people and lack of job recognition:
- I feel emotionally affected by seeing sick people or other patients dying and suffering (B).
- [...] here I suffer humiliations coming from everyone, my work is not recognized, we suffer humiliations by doctors and employees because we are cleaning the floor (E).

Another problem found is psychological load described by participants regarding interpersonal relationships:
- [...] some employees do not accomplish their service for lack of interest, and we become overloaded [...] we must work as a team (A).

2. Load experienced in the workplace related to external materiality

Among these loads participants detected to be exposed to biological agents:
- [...] our work is not easy; many times there are secretions and risk of infection (D).
- [...] we have contact with blood, feces, urine – all of these can transmit diseases (L).

3. Strategies of confrontation to make workloads tolerable

Testimonials highlighted the need for teamwork as a strategy to make work more pleasant:
- [...] Teamwork, one thinking to benefit another, is pleasant and good. It also makes things easier and makes us stronger; dealing with things alone is more difficult (H).

Other ways of confrontation used by cleaning professionals are exercises and leisure activities:
- I practice swimming to relieve my workload (D).
- I take walks for exercise, to improve my humor, and decrease stress (J).

Religiosity also constituted a strategy to confront workloads according to respondents:
- My faith and God help me to face job problems (B).

In addition, some professionals used personal protective equipment (PPE) as a strategy of confrontation or prevention:
- I use gloves and boots to [protect] myself against contamination (F).
- When I’m cleaning, I wear boots and rubber gloves to avoid infection from patients, secretions, bathrooms, and other things that could cause impairment (J).

Discussion

In many hospitals in Brazil, cleaning services are coordinated by the nursing service, which is responsible for the management of this service. Therefore, this topic is interesting for the nursing arena and for other health professionals, particularly for the small number of studies approaching this theme.

These study results showed that cleaning professionals have similar characteristics to nursing professionals’ population concerning shift work schedule adopted and the predominant number of women. However, important
data constitute how long participants have been working in the emergency unit, because approximately half of the workers have been employed for more than 20 years inside an emergency unit, which is considered by several health professionals as a stressful environment.\(^{10}\)

Studies of workers in hospital cleaning services resemble our findings concerning the predominant number of women who perform these services. A study conducted in a hospital in Belo Horizonte (MG) identified that 99.18% of cleaning professionals were women,\(^{6}\) another study in the academic hospital in Maringá (PR) reported that 100% of cleaning professionals were women,\(^{9}\) and 65.1% of workers of a cleaning service were women in a public hospital in Campinas (SP).\(^{11}\)

From testimonials, it was possible to identify the loads that are meaningful to workers: loads of a physiological nature, mainly back pain; those of a psychoemotional nature because of an environment surrounded by suffering and unexpected situations; and those of a psychological nature because of lack of recognition of work accomplished by other professionals; besides issues concerning interpersonal relationship and teamwork. Load from a biological nature was also identified by cleaning professionals.

Regarding low back pain mentioned by cleaning professionals, we believe that they are related to the types of activities performed, which include frequently carrying objects and heavy materials. Studies on hospital cleaning staff showed that these people often report low back pain.\(^{11}\)

Working in an emergency unit requires specific training for professionals to deal with suffering situations, such as the pain of patients and their families.\(^{12}\) In general, these professionals have to deal with feeling as impotence and suffering. These two feelings were identified in participants’ testimonials in this study, who were directly exposed to effects from this daily experience with patients and other users.\(^{9}\)

Cleaning professionals felt a lack of recognition for their work by other professionals and also reported the feeling of prejudice in society as whole. This finding was identified as a psychological load in the sample.

Studies conducted on nursing professionals in the Intensive Care Unit (ICU) of Hospital de Base do Distrito Federal identified a feeling of lack of recognition by professionals in their work on levels considered critical, because these feelings constituted risks for physical and mental health problems, leading to the development of diseases.\(^{13}\) A study carried out in a public hospital in south of Brazil showed that cleaning professionals’ distress was related to the feeling of invisibility because of relationship problems with other professionals in the organization in which they felt to be in a position of disadvantage.\(^{12}\) In another study, caretakers in a public hospital in Paraná perceived their lack of recognition and reported indignation because of lack of recognition by other professionals in the institution.\(^{9}\)

In a hierarchy division of work, there are those who care and those who provide support to tasks. In our study, cleaning professionals are involved in a team that works in the emergency unit, especially for their daily experience in this environment. Cleaning services require less professional qualification and could be considered a professionalization of housekeeping, but with lower salaries.\(^{9}\)

To be professionally recognized for the work is important, for such recognition promotes motivation and improves quality of life. To recognize and be recognized by the team is a complementary and positive aspect of the work; therefore, it contributes to the maintenance of self-esteem and the psychoemotional balance of workers.\(^{9}\)

Teamwork was identified by the cleaning workers as a loan due to lack of collaboration between work partners and also as a defense. Cooperation between workers must be motivated to seek quality, which is vital to achieve pleasure in the work.\(^{13}\)

A study carried out in a public hospital in Brazil that involved professionals from a cleaning service and hospital hygiene identified a small integration among employees. Such a fact is related to how that work is organized and imposes a more solitary service. In this aspect, teamwork sometimes is not perceived as a union, causing a
weakening of professional relationships and a decrease of cooperation among coworkers. When contributions of all occur in a specific activity or function, it is of high importance to develop cooperating activities to provide the opportunity to build solidarity. It is important for integrants to have a subjective experience with implication to the group because everyone could contribute to improve life and work conditions.

To work in a hospital means to experience an unhealthy environment because of the features of the activities performed; closeness with patients with different diseases; and, sometimes, an unclear diagnosis that exposes workers to situations of vulnerability in front of workloads.

Cleaning professionals must take strategies to deal with workload and create defense mechanisms against exposure to others’ suffering mainly in the hospital environment with preconcepts and teamwork.

Although cleaning professionals seem invisible, for some people, their service is indispensable for the hospital operating structure. Cleaning services promote safety and prevention of accidents for patients, families, and health professionals, help greatly to avoid contamination and nosocomial infection, and provide adequate management of hospital residues among other benefits. Cleaning services are needed for the success of performing medical procedures. Nurses with cleaning services and inadequate disinfection are local facilitators for survival of microorganisms that increase the probability of occurrences of nosocomial infections.

Exposure to secretions and blood were identified by cleaning workers as loads of a biological nature. This knowledge is important to adopt health protection strategies.

The concern of exposing to biological load became evident in the 1980s because of the HIV epidemic when the US Centers for Disease Control and Prevention introduced the “universal precautions” (later renamed “standard precautions”), which stated the need for health professionals involved directly or indirectly with patient care to wear gloves when in contact with body fluids.

Workers who are responsible for cleaning the hospital should take protective measures such as the use of PPE. Collective security measures in the environment and during work activities must be equally considered in the planning to prevent work accidents and occupational diseases.

Among strategies used to soften confrontation or prevent workload mentioned by participants were exercises and leisure activities, religiosity, and the use of PPE; however, in testimonials, collective strategies were not identified. Religion constituted a way of defense to face work adversities.

Results of a study conducted in the United States by the American College of Sports Medicine suggested physical activities in the work environment to promote health and prevent diseases. It is important to emphasize the need to prepare these professionals to prevent accidents and diseases in the work environment. A study on cleaning professionals conducted in Brazil detected that although most of the participants were considered prepared for occupational activities in the hospital, work accidents occurred because of misuse or inadequate use of PPE.

Although workloads from a chemical nature were not identified by participants in our study, the medical literature shows that these loads are presented in cleaning professionals. A study conducted in France showed a significant association of women with asthma exposed to several cleaning projects in the hospital environment. Similar results were found in research conducted in Spain in which a significant association was observed between cleaning products and symptoms of asthma in cleaning professionals.

Another investigation of hospital cleaning professionals conducted in Canada identified that understanding the beliefs and behaviors of these professionals is fundamental in planning strategies for training people in these position, envisaging benefits for all professionals involved.

Hence, to prevent the health of workers in health institutions according to what is stated in regulation NR-32, it is the employers’ duty to provide enough PPE for professionals, guarantee the quality of the equipment, and train profes-
sionals on how to use the equipment. In this context, nurses who supervise the cleaning service must know deeply the activities performed by professionals in order to preserve supervise, and promote good health among employees.

Findings in our study suggest that collective strategies must be adopted to widen information of cleaning professionals concerning workload and exposure to activities in the occupational environment. Actions to place value on the work and enable participation in teamwork must be taken.

A limitation of our study was that the participants were composed only of cleaning professionals. If extrapolated to other groups, the results would be more substantial; however, our findings support and stimulate those of other researchers.

This study contributed to advance knowledge because of new information about the meaning of workload for a specific group of professionals who generally lack information and sometimes are forgotten in the planning of actions and strategies to prevent and control occupational risks. Contributions of this study entail actions that nurse supervisors should take to guarantee conditions that would decrease employees’ exposition to workload of internal and external materiality as well as to promote educational and collective actions to promote an adequate occupational environment and better practices.

**Conclusion**

We concluded that cleaning professionals working in the emergency unit identified the workloads that they were exposed from a biological, physiological and psychological nature. However, they were unable to identify chemical, physical and mechanical workloads presented in their work environment. Professionals recognized the loads partially, and they dealt with them separately; the strategies used by them to confront loads were exercises, recreational activities, practice of religion, and the use of PPE.

**Collaborations**

Martins JT contributed to the design of the project and with all stages up to the final drafting of the manuscript. Ribeiro RP and Bobroff MCC performed data collection, analysis, interpretation, and discussion of data; they also helped in drafting of the article. Marziale MHP, Robazzi MLCC, and Mendes AC contributed to the analysis, interpretation, and discussion of data and also helped in critical drafting of the manuscript.

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Meaning of workload on the view of cleaning professionals


Spirituality of relatives of patients hospitalized in intensive care unit

Espiritualidade dos familiares de pacientes internados em unidade de terapia intensiva

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Abstract

Objective: To assess spiritual/religious coping (SRC) of relatives of patients hospitalized in the Intensive Care Unit of two hospitals.

Methods: Quantitative descriptive study. Data were collected from 45 family members (80% female and 20% male, mean age 37.5 years) using a questionnaire for sample characterization and SRCOPE scale.

Results: The value of total SRCOPE scale obtained was 3.4 showing that the family participants used SRC strategies. Regarding the ratio of negative SRC/positive SRC, the mean value was 0.7, demonstrating that the positive SRC strategies were used more often.

Conclusion: Family members use positive SRC strategies more than negative during the hospitalization of a family member in the ICU, they all believe in God and most believe that spirituality has helped them to cope with the stress of hospitalization.

Keywords

Nursing; Nursing research; Nursing care; Spirituality; Stress, psychological

Descritores

Enfermagem; Pesquisa em enfermagem; Cuidados de enfermagem; Espiritualidade; Estresse psicológico

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Resumo

Objetivo: Avaliar o coping religioso/espiritual (CRE) dos familiares de pacientes internados em Unidade de Terapia Intensiva de duas instituições hospitalares.

Métodos: Estudo descritivo quantitativo. Os dados foram coletados de 45 familiares (80% do sexo feminino e 20% do sexo masculino com idade média de 37,5 anos) por meio de um questionário de caracterização da amostra e da Escala CRE.

Resultados: O valor do CRE total obtido foi de 3,4 mostrando que os familiares participantes fizeram uso médio de estratégias de CRE. Em relação ao valor da razão CRE negativo/CRE positivo, o valor médio encontrado foi 0,7, demonstrando que as estratégias de CRE positivas foram mais utilizadas.

Conclusão: Os familiares utilizam estratégias de CRE positivas mais do que negativas durante o processo de hospitalização de um familiar em UTI, todos eles acreditam em Deus e a maioria crê que a espiritualidade tem ajudado a enfrentar o estresse da hospitalização.
Introduction

The term spirituality derives from the Latin *spiritus* which means “the essential part of the person that controls the mind and body,” everything that brings meaning and purpose to people’s lives.(1) Therefore, spirituality refers to a matter of personal nature: response to fundamental aspects of life, relationship with the sacred or transcendent and may (or may not) lead to the development of religious rituals and the formation of communities.(2)

Religion is a belief in the supernatural or in a divine force that has power over the universe and leads to worship and obedience through a comprehensive code of ethics and philosophy.(3) It is an organized system of beliefs, practices, rituals and symbols designated to facilitate access to the sacred, the transcendent (God, Majeure Force, Supreme Truth). It involves how much an individual believes, follows and practices a religion. It can be organizational (participation in church or house of worship) or non-organizational (pray, read books, watch religious programs on television).(4)

Spirituality is a broader concept than religion. One does not need to belong to an organized religion to achieve spirituality,(5) because it refers to questions of meaning of his/her own life and reason to live, regardless of religious beliefs and practices.(5)

Spirituality can be an important aspect for those who experience a serious illness in the Intensive Care Unit (ICU) or is near death, because it helps coping and accepting pain and suffering in printing some meaning to them. A good relationship with God or a belief in a higher power allows the patient and their family the understanding and acceptance of human suffering, regardless of professed religious belief.(6,7)

Religion and spirituality may be present during a situation of hospitalization in an ICU due to fear of the unknown and the outcome. The mechanisms used to cope can manifest themselves through gestures, words or religious accessories such as: the rosary and bible. However, questions arise as to the positive or negative aspect used in this process, for example, do family members use spirituality/religion as a form of support or the blame for what is happening?

The process of facing or coping can be described as a situational process, a set of strategies used by people to adapt to stressful or adverse circumstances. The stress stimuli is any response involving a spontaneous emotional or behavioral response. The aim of coping constitutes in the intention of a response, usually, aimed at reducing stress.(8)

The Spiritual/Religious coping (SRC) is defined as the use of religious beliefs and behaviors that seek to facilitate troubleshooting, prevent or alleviate the negative emotional consequences.(9) Four assumptions support this concept: the existence of threat, harm or challenge; assessment that the person makes of the situation; available resources to cope with stress and responsibility when dealing with certain experience.(10)

The quality of life of individuals is directly affected either by the positivspiritual/religious coping (PSRC) or by negative (NSRC).(11) When it involves strategies that provide positive and beneficial effect to the individual, which may involve an expression of spirituality, a secure spiritual relationship connection with God and with others, and therefore result in better quality of life. On the other hand the NSRC results in strategies that generate harmful consequences to the individual, such as questioning the existence, love or acts of God, delegating to God the resolution of the problems, feeling dissatisfaction or discontent towards God or patrons and members of religious institution, redefining the stressor as divine punishment or evil forces, bringing lower rates of quality of life as a result.(12,13)

In the search for answers is the applicability of this research, it would be important that nurses could identify the type of coping used by family members of ICU patients and then start planning the care, (re)thinking the care of an expanded form, seeking to include spirituality as an element inherent to treatment and inserting the family in this context. Give spiritual assistance can be complex, so only identify spiritual needs and refer to the religious leaders present in hospitals can be a first step to ahumanized and individualized assistance to these family members.

Recognizing faith and spiritual dimension in the process of recovery and facing the disease
will create a new social and cultural paradigm in nursing care. The objective of this study was to evaluate the Spiritual/Religious coping of family members of patients in two intensive care units.

Methods

A descriptive study conducted in two institutions: Charity Hospital Saint Vincent de Paul (HCSVP), a public institution located in Jundiaí and Hospital SEPACO (Social Service of Paper, Cardboard and Cork Industry of the Sao Paulo State), a private institution located in the capital.

In total, 45 families participated in the research and they were selected by non-probability sampling and convenience.

Inclusion criteria were: family kinship with first or second kinship degree of ICU patients; adults aged greater than 18 years and less than or equal to 65 years; to be present at the time of the visit at the time of data collection and family members of patients between the fifth and 30th day of hospitalization, i.e., at the critical moment of stress and change. This period was chosen because at the beginning of hospitalization anxiety and coping mechanisms have not been triggered yet and after this period there may be adaptation of the individual.

There are three phases described in the manifestation of stress: acute reaction or alarm, which is triggered whenever our brain, independent of our will, interprets a situation as threatening; resistance phase that occurs when tension builds up and there are fluctuations in the habitual way of the individual being; and the exhaustion phase in which there is a sharp drop of the defense mechanisms of the individual. Thereafter, there may be a period of adaptation to the new situation.

The exclusion criterion was elderly relatives aged greater than 65 years because of the possibility of cognitive difficulty to answer the questions of the study.

Data collection occurred between the months of August and September 2010 and the study met the national and international ethical standards. Data were collected by the authors during hospital visits and at the end of the visit they responded to Spiritual/Religious Coping Scale (SRCOPEScale).

Before that, a questionnaire with demographic, socioeconomic, religious and health data was applied, it has 23 questions, developed and tested in the first stage of the validation study of SRCOPE Scale to characterize the population being studied. They were then applied to Spiritual/Religious Coping Scale (SRCOPEScale) adapted and validated in Brazil with excellent internal consistency index (0.97) of the North American Religious Coping Scale (RCOPE).

The Spiritual/Religious Coping Scale comprises the SRC strategies, divided into positive strategies (PSRC) with 66 items grouped into eight positive factors, and negative factors coping strategies (NSRC) with 21 items grouped into four negative factors, a total of 87 questions. The answers vary in intervals of five Likert, (1) “not important” (2) “somewhat important” (3) “indifferent” (4) “important” and (5) “very important” and the higher the numerical value, the greater use of spiritual/religious coping. The use of SRC may be assessed by the levels of scale scores classified as: “no or negligible”: 1.00 to 1.50, “low”: 1.51 to 2.50; “average”: 2.51 to 3.50, “high”: 3.51 to 4.50 and “very high”: 4.51 to 5.00.

To achieve the goal, the following sentence on the scale was replaced “at this time, think about the most stressful situation you have experienced in the last three years,” for “at the moment, think of the stress you are experiencing in this hospitalization situation of a family member in Intensive Care Unit.” This replacement was needed for the family focusing referring to the situation experienced having a family in the ICU and the spiritual/religious coping mechanisms involved in this process.

After data collection, the data were stored in a spreadsheet (Excel) and analysis was performed using descriptive statistics (mean, median, standard deviation).

The study followed the development of national and international standards of ethics in research involving humans.
Results

Among the 45 family members, 36 (80%) were female, mean age was 37.5 years (standard deviation ± 13.7), 16 (35.6%) had completed high school, 17 (37.8%) reported monthly income of up to five minimum wages, and 21 (46.7%) were married.

All believed in God (n = 45, 100%), the majority have always believed (n = 41, 91.1%), were catholic (n = 29, 64.4%) and have never changed their religion (n = 36, 80%).

Regarding the importance and frequency of religion in one’s life, 19 (42.2%) of the relatives thought that religion is important to deal with stress, 31 (68.9%) said religion is very important in their lives in general, 11 (24.4%) attend religious meetings once a week and 14 (31.1%) stated that they engage into private religious activities more than once a day.

Most families (n = 25, 55.6%) believe that spirituality/religion has helped in managing to cope with stress, 20 (44.4%) reported that identify in themselves spiritual growth, 20 (44.4%) said they had grown very close to God and 14 (31.1%) reported to be growing by the religious institution.

The scores and domains in relation to Spiritual/religious coping were calculated according to the method proposed by the Brazilian validation study of SRCOPE Scale (Table 1).(10)

The total SRC in this research had a mean of 3.4 (± 0.3 standard deviation) showing that family members-participants made mean use of general SRC strategies.

The PSRC dimension, the mean value found in the responses was 2.7 (± 0.8 standard deviation), that is, mean usage PSRC strategies and the NSRC dimension, and the size was found to be 1.9 (± 0.6 standard deviation), low use of NSRC strategies. The ratio NSRC/PSRC was 0.7 (± 0.2 SD) and by having a low value, it is considered that relatives of this research made greater use of positive SRC strategies than negative.

Among the means achieved by SRC positive factors, the dimensions that showed high values were the factor (P4) “Positive position towards God” (3.5 ± 0.6 standard deviation), the factor (P8) “Distancing through God, religion and/or spirituality” (3.2 ± 1.0 SD) and factor (P1) “Transformation of oneself and/or one’s life” (3.0 ± 1.0 standard deviation), respectively.

### Table 1. Spiritual/religious coping of patients family members hospitalized in ICU

<table>
<thead>
<tr>
<th>Total SRC</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Median</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive SRC</td>
<td>3.4</td>
<td>0.3</td>
<td>3.4</td>
<td>2.6</td>
<td>4.1</td>
</tr>
<tr>
<td>Negative SRC</td>
<td>2.7</td>
<td>0.8</td>
<td>2.7</td>
<td>1.4</td>
<td>4.5</td>
</tr>
<tr>
<td>NSRC/PSRCRatio</td>
<td>1.9</td>
<td>0.6</td>
<td>1.7</td>
<td>1.1</td>
<td>3.4</td>
</tr>
<tr>
<td>Positive Factors (P)</td>
<td>0.7</td>
<td>0.2</td>
<td>0.7</td>
<td>0.4</td>
<td>1.4</td>
</tr>
<tr>
<td>(P1) Transformation of oneself and/or one’s life</td>
<td>3.0</td>
<td>1.0</td>
<td>3.1</td>
<td>1.3</td>
<td>4.8</td>
</tr>
<tr>
<td>(P2) Actions in search of spiritual help</td>
<td>2.2</td>
<td>1.0</td>
<td>1.9</td>
<td>1.0</td>
<td>4.3</td>
</tr>
<tr>
<td>(P3) Offering help to the other person</td>
<td>2.5</td>
<td>1.1</td>
<td>2.4</td>
<td>1.0</td>
<td>4.6</td>
</tr>
<tr>
<td>(P4) Positive position towards God</td>
<td>3.5</td>
<td>0.6</td>
<td>3.7</td>
<td>1.9</td>
<td>4.3</td>
</tr>
<tr>
<td>(P6) Actions in search of spiritual knowledge</td>
<td>2.8</td>
<td>1.0</td>
<td>2.8</td>
<td>1.2</td>
<td>5.0</td>
</tr>
<tr>
<td>(P7) Personal search for spiritual knowledge</td>
<td>2.4</td>
<td>1.1</td>
<td>2.1</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>(P8) Distancing through God, religion and/or spirituality</td>
<td>1.8</td>
<td>0.9</td>
<td>1.6</td>
<td>1.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Negative Factors (N)</td>
<td>3.2</td>
<td>1.0</td>
<td>3.3</td>
<td>1.2</td>
<td>4.8</td>
</tr>
<tr>
<td>(N1) Negative reassessment of God</td>
<td>1.6</td>
<td>0.8</td>
<td>1.3</td>
<td>1.0</td>
<td>4.4</td>
</tr>
<tr>
<td>(N2) Negative reassessment of God</td>
<td>2.7</td>
<td>0.9</td>
<td>2.8</td>
<td>1.3</td>
<td>5.0</td>
</tr>
<tr>
<td>(N3) Negative reassessment of the meaning</td>
<td>1.7</td>
<td>0.8</td>
<td>1.2</td>
<td>0.8</td>
<td>3.8</td>
</tr>
<tr>
<td>(N4) Dissatisfaction with the institutional other (N4) Insatisfação com o outro institucional</td>
<td>1.5</td>
<td>0.5</td>
<td>1.3</td>
<td>1.0</td>
<td>3.0</td>
</tr>
</tbody>
</table>
The factor P4 “Positive position towards God” is described as any behavior that SRC exposes a personal position before God about the situation and sets limits and seeks religious support in God. The factor P8 “Distancing through God, religion and/or spirituality” indicates a change in personal perspective regarding the situation in which the person moves away from the approaching problem of God and/or issues of spiritual/religious. The factor P1 “Transformation of oneself and/or one’s life” relates to the entire SRC behavior that brings about a personal transformation, whether it is a person’s own internal modification to the practice and/or a change in your external life.\(^{(10)}\)

In terms of mean achieved by NSRC factors, the dimension with the highest mean value was (N2) “Negative position towards God” (2.7 ± 0.9 standard deviation). This factor describes the entire SRC behavior in which a person seeks or simply wait for God to take control of the situation and blame this entity for resolving it, without their individual participation.\(^{(10)}\)

Discussion

The SRCOPEScale was not designed to analyze the Spiritual/religious coping of a specific situation, this is a limitation of the study. Having a family member in an intensive care unit can be experienced in different ways and with different perspectives; in addition, the severity of the hospitalized patient can influence the outcome.

However, the results of this study suggest that meaningful inferences can assist nurses in care of this issue which is so important to the care of the patient and his/her family: spirituality. Family members use more positive SRC strategies than negative during the hospitalization of a loved one in an ICU, seeking support in spirituality, away from the problem, approaching God and reaching personal transformation through experience. Therefore, one may consider that spirituality in this clinical situation produces beneficial and positive effects to the participant and therefore may result in a better quality of life and well-being of the family.

The hospitalization of a loved one can generate a situation of extreme and deep stress in family members and it would be interesting that nurses could identify this need for care. Despite the growing importance of the theme of spirituality in health, considering the increased number of studies in relation to spirituality and due to two nursing diagnoses in this area are contained in the North American Nursing Diagnosis Association, \(^{(16)}\) “Impaired Religiosity” and “Spiritual Suffering”. Unfortunately, in clinical practice patients and families related to religiosity and spirituality are poorly attended.

Factors that showed higher mean values in this study refer to Search in God the support, moves away from the problem by approaching God, personal transformation and expects God to control and resolve the situation. Factors that demonstrate that the individual seeks a divine solution and not necessarily rational in this situation of a family member illness. Personal transformation can represent a quest for greater intimacy with God and recognition of the importance of spirituality in one’s life to support and accept the possible outcomes. The questions that arise when the individual is faced with the imminent death of a loved one, for which we are hardly promptly prepared.

Studies \(^{\text{11,14,17}}\) were performed to evaluate the Spiritual/religious coping in different clinical situations and illness. The SRC has been studied in men with HIV/AIDS belonging to Catholic (n = 50) and evangelical (n = 30) religions.\(^{(11)}\) SRCOPE Brief-Scale was applied, and the main coping strategies were presented by subject analyzed and compared between groups of Catholics and evangelicals. The overall SRC index was 3.67 among Catholics and 3.64 among evangelicals, which demonstrates the practical use of SRC in both groups. The factor that most Catholics and evangelicals used was “Positive position towards God” (P4). Already the most negative factor used by the two groups was “Negative position towards God” (N2). Comparing groups, the differences in PSRC factor, “Transformation of oneself and/or one’s life” (P1), “Actions in search of the institution” (P6) and “Personal search for spiritual knowledge” (P7) were statistically more common in evangelical. Among the NSRC strategies,
the factors “Negative position towards God” (N2) and “Negative reassessment of the meaning” (N3) had statistically significant differences, also more common among evangelicals.

The objective of another study was to evaluate the association of SRC in quality of life related to health of 55 patients in preoperative surgery for head and neck cancer. For this, the authors used the Functional Assessment Cancer Therapy-Head and Neck (FACTH & N) and the SRCOPEScale. All participants believed in God, and most of them considered themselves Catholics (87.3%). The totalSRC was 3.61. The NSRC/PSRC ratio was 0.6, indicating greater use of positive SRC strategies than negative. The factor “Positive position towards God” (P4) had the highest mean (3.92) among other PSRC factors. Considering the NSRC factors mean, the size with the highest mean value was “Negative position towards God” (N2) (2.62). Although it is possible to deduce a correlation between HRQOL and SRC constructs, it was not detected an association between the SRCOPEScale and FACT-H & NScale. Nevertheless, no statistically significant difference between correlations to those with high and medium Total SRC and SRCOPEScale and the high and low scores in the areas of instrument FACT-H & N, indicating that one who has a high use of religious coping, spiritual presents best rates in the areas of quality of life related to health.

The SRCOPEScale was applied to 30 volunteers (15 female and 15 male) undergoing cancer treatment. Positive and negative SRC patterns for men and women were compared. The results showed increased use of strategies for PSRC (Mean = 3.51) than for NSRC (Mean = 2.17), there were no statistically significant differences between positive and negative mean regarding gender (p = 0.9 for PSRC p = 0.19 for NSRC).

Comparing these described researches with our current research, it was found that the mean use of strategies of total SRC found in this investigation differs from above using total SRC found in other situations: patients with HIV/AIDS, patients in the preoperative surgery for head and neck cancer and patients undergoing cancer treatment. In the results, this difference may be related to the data collection period and the period required so that the coping mechanism is triggered. Nonetheless, the similarity is that subjects make more use of PSRC strategies, or use faith and belief in God to deal with a stressful situation related to health. In addition, the more used PSRC and NSRC factors in these studies were the same as in our study: P4 and N2. The results found reveals an apparent conflict, at the same time that people positively seek God for support in these crisis situations, they expect God to take control and be accountable for solving problems without the participation of the individual.

Some situations seem to refer more easily to spiritual matters. Cancer and spirituality were also studied in other studies. Strategies of the positive use of faith and spirituality play an important role demonstrated by recently diagnosed 155 women with breast cancer adaptation process after surgery. Feelings of abandonment by God and punishment was a negative coping feeling and they were found responsible for the increased level of anxiety. However, the acceptance of suffering and the use of faith decreased anxiety in these patients.

In another study, the anxiety level assessed by the Trait Anxiety Inventory-State Scale was correlated with the religiousness of Personal and Rotterdam Symptom Checklist in 180 women with breast cancer. The results showed that: religiosity is a factor for effectively coping and dealing with the anxiety of patients with terminal breast cancer, the stage of cancer is a differentiating factor compared to levels of anxiety revealed in the subjects studied; exacerbation of somatic symptoms did not influence the level of anxiety in terminal cancer patients and diseases without period.

The issue of chemical dependency, perhaps due to the impotence that addicts feel about the addiction, is also a situation in which spirituality can be used. The influence of religiosity and spirituality in the recovery of ten addicts was investigated in abstinence and in recovery process. The results showed that seven workers attributed to religion/spirituality as a main factor to reach and remain abstinent. In addition, eight respondents cited pursue religion and spirituality develop at a more critical and more involved with alcohol/other drugs.
In a research, relatives of patients with alterations of consciousness in the ICU recorded messages. Transcription and analysis of those messages showed the category “Searching for spiritual support to overcome difficulties”[21]. Regardless of religion, the family demonstrated that they seek for spiritual support in times of uncertainty and insecurity. In the messages assessed, there was a strong expression of religiosity; words such as God, Jesus and prayer were very present in almost every speech. This spiritual attachment to this situation of having a loved one hospitalized in an ICU is often related to the need not to lose hope, the proposed changes, the promises and waiting for a miracle.

Spirituality is an important part of life for many people and cannot be neglected in the therapeutic context and should be more closely explored by health professionals who should help identify the potential of faith (positive SRC) as well as losses (negative SRC)[17].

Health professionals, based on science and individualized care, should be concerned with the actual insertion of spiritual care in routine care, allowing academic discussions to enhance practices, aiming the wellbeing of those who need care right now, noting that, in this context, the family is an integral and important part in patient recovery.

The SRC strategies used may reveal some familiar feelings of stress experienced in that situation, and when identified, and when disclosed, these feelings can be helpful in the recovery process of the patient so that the family member does not get worse, which can be minimized with the help of the nurse, the depression, anxiety and stress, so common feelings in these crisis situations.

Conclusion

Family members use more positive SRC strategies than negative ones during the hospitalization of a family member in the ICU, they all believe in God and most of them believe that spirituality has helped them to deal with the stress of hospitalization.

Contribution

Schleder LP and Parejo LS participated in the project design, analysis and interpretation of data. Parejo LS; Puggina AC and Silva MJP collaborated with the writing of the article and revising it critically for important intellectual content. Puggina AC and Silva MJP stated that contributed to the final approval of the version to be published.

Referências

Spirituality of relatives of patients hospitalized in intensive care unit


Objective: Developing an instrument to measure the time spent by nursing staff in interventions performed in diagnostic imaging centers.

Methods: Cross-sectional study conducted at a private general hospital with the following steps: A) Identification of nursing activities through literature review and field observation. B) Cross-mapping of the activities identified in nursing interventions according to the Nursing Intervention Classification (NIC). C) Validation of interventions. D) Pilot test of the instrument using the work sampling technique.

Results: The judges validated 92 nursing activities corresponding to 32 interventions of the Nursing Interventions Classification (NIC). The most common interventions were: examination assistance, documentation, case management, telephone follow up, admission care and health care information exchange.

Conclusion: The instrument proposed to measure working time in nursing based on nursing interventions in Diagnostic Imaging Centers, has been validated and is available for use.

Keywords
Nursing; Nursing staff; Workload; Radiology department, hospital; Nursing administration research

Descritores
Enfermagem; Recursos humanos de enfermagem; Carga de trabalho; Serviço hospitalar de radiologia, Pesquisa em administração de enfermagem

Abstract
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Resumo
Objetivo: Desenvolver um instrumento para medir o tempo despendido pela equipe de enfermagem, nas intervenções realizadas em centros de diagnóstico por imagem.


Resultados: Foram validadas pelos juízes 92 atividades de enfermagem correspondentes a 32 intervenções da Classificação de Intervenções de Enfermagem NIC. As intervenções mais frequentes foram: Assistência em Exames, Documentação, Gerenciamento de Caso, Acompanhamento por telefone, Cuidados na admissão e Troca de Informações sobre cuidados de Saúde.

Conclusão: O instrumento proposto para medição do tempo de trabalho da enfermagem, fundamentado nas intervenções de enfermagem em Centro de Diagnóstico por Imagem, foi validado e encontra-se disponível para utilização.

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Introduction

The trends towards costs reduction and productivity increase are a global phenomenon and demand that professionals involved in the provision of health services use measures of cost analysis appropriate to the current reality.

Hence actions are necessary for continuous quantitative and qualitative evaluations of nursing staff in each sector of health organizations where those resources are allocated and where the assistance process is developed.(1)

A proper sizing of professionals in nursing is closely related with safety of patients and workers. In the absence of the quantitative and qualitative necessary to provide safety for patients, their protection will not be possible.(2)

Organizations that do not make efforts to provide good working conditions for nursing professionals can put their patients in situations of greater vulnerability to the occurrence of adverse effects.(3-5)

In its statement on patient safety the International Council of Nurses(6) reiterates that professionals and national nursing associations, have the responsibility to: show an active position in search of quality in nursing care, claim a better sizing of the nursing team and develop mechanisms that promote excellence in professional practice, aiming the promotion of patient safety.(6)

In recent years, the sizing of nursing staff has been studied in several areas of health care services.

However, with respect to services in which patients do not remain hospitalized, there is still a shortage of indicators to gauge nursing professionals, like in the cases of Diagnostic Imaging Centers (DIC), often called Radiology.

Among the major diagnostic and therapeutic modalities used in a DIC may be cited: Ultrasound, MRI (Nuclear Magnetic Resonance Imaging), CT (Computerized Tomography), Mammography, Conventional Radiology, Vascular and Interventional Radiology, Densitometry, Radiotherapy, Nuclear Medicine, among others.

Each of these modalities constitutes a universe with its own peculiar characteristics.

The radiological nursing is a specialty related to assistance for users submitted to diagnostic and therapeutic procedures in the DIC.(7)

The technological development, with more agile and resolute appliances favors the performance of invasive procedures, which in a prior moment would be performed in surgeries with greater risk of complications.

In this scenario the DIC have received more and more users in complex situations and depending on nursing care, which justifies the need for a number of staff qualified to meet this needs.

So the question that motivated the development of this study was:

What are the activities that affect the workload of nurses in assisting patients seen in the areas of CT, MRI, Ultrasound, Mammography and Conventional Radiology?

This question allows formulating the following hypothesis:

The Nursing Interventions Classification (NIC)(8) presents itself as an important theoretical and methodological framework for the classification of nursing activities in interventions to build an instrument to measure the time spent by nursing professionals during care with users in the DIC.

The taxonomy proposed by the Center for Nursing Classification and Clinical Effectiveness, called Nursing Interventions Classification (NIC), has been used by Brazilian researchers in building tools that allow measuring the time of nursing work.(9-12)

The NIC is a standardized language, proper for nursing, which is intended to communicate a common meaning to several sites of care, as well as helping the improvement of assistance and management practices through development of research that allows the comparison and evaluation of care in nursing provided in different settings.(8)

The aim of this study was to develop an instrument to measure the time spent by nursing staff in interventions/activities in Diagnostic Imaging Centers.

Methods

Cross sectional study conducted in a DIC at a private general hospital located in the city of São Paulo,
Nursing time in a diagnostic imaging center: development of an instrument

São Paulo Province, Brazil, considered to have good nursing practices by the accreditation received (Joint Commission International: Gold Certification), and because of the tradition in providing nursing services of high quality in the sectors of Computerized Tomography, Nuclear Magnetic Resonance Imaging, Ultrasound, Mammography and Conventional Radiology.

The DIC of this hospital has an expressive technological park, with equipments in constant modernization. It has four sets of computerized tomography equipment, five of nuclear magnetic resonance, 13 of conventional radiology x-ray, one stereotactic table, two digital mammography and 12 ultrasound machines.

The nursing staff of the studied sectors was composed of 62 professionals, including nurses and technicians/assistants in nursing. The study included 17 professionals, three nurses and 14 technicians/assistants in nursing that were present in the sectors during the data collection period and who consented to take part in the research.

The survey data were collected and organized according to the steps: identification of nursing activities; cross-mapping of the identified activities in accordance to the Nursing Interventions Classification NIC; validation of the interventions/activities in nursing and pilot testing of the instrument.

The activities were raised through literature review and direct field observation. The literature review considered scientific papers, thesis, dissertations and books during the period between the years 2000 e 2011, written in English, Portuguese and Spanish along with the summaries.

The following database were used: EMBASE, US National Library of Medicine (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Literature of Latin America and the Caribbean in Health Sciences (Lilacs), Medical Literature Analysis and Retrieval System Online (Medline).

The descriptors were: nursing staff, workload and hospital radiology service.

After the survey and the analysis of the publications found, the ones that did not have nursing care in DIC as their main focus were excluded.

To identify the presence of other activities not mentioned in the literature on DIC, it was held a direct and non-participant observation of nursing professionals during the development of their activities in each sector for three days on average, in the period between 8am and 5pm, during the month of October 2011. The researchers recorded the activity using an electronic device (tablet) and at the end of the day, identified if there was duplication of activities.

Using the technique of cross-mapping, the activities were classified in nursing interventions according with the NIC.

To classify the activities in nursing interventions it was used the cross-mapping technique which consists of allocating the identified activities in interventions, maintaining the consistency between the activity and the intervention definition in taxonomy.

The activities that are related to nursing work and that can be performed by other professionals were classified as associated and those not related to the work such as feeding, resting, etc were classified as personal.

The interventions/activities in nursing of the five sectors of the DIC were authenticated in a workshop through content validation by seven judges chosen according to the criteria: nurse with four years of experience and knowledge in the nursing field in DIC and/or in use of NIC and who consented to participate of the Workshop.

Each nursing intervention was assessed regarding: clarity, objectivity in conceptualization, in description and classification of the indicated activities as well as whether the pointed activities represented nursing work in DIC and if there was necessity of inclusion or exclusion.

To construct the instrument to measure the distribution of working time in the DIC, the nursing interventions were listed alphabetically and identified by code. The workday was divided into columns and at intervals of 10 minutes.

The instrument was applied for each professional during six hours on a typical workday, in every sector of the study. The measurement observation always noticed the same sequence or, in other words, the same order of professionals observed when performing work, present in the sectors, to-
talizing three nurses and 14 technicians/assistants in nursing. The pilot testing had as main objective to identify if the designed instrument was able to capture the interventions/activities in practice and consequently, the distribution of time spent in these interventions/activities during a work shift.

For this it was used the work sampling technique, which consists in recording the activities of workers in predetermined categories by instant, intermittent and spaced observations.\(^{(15)}\)

In pilot testing, interventions/activities were recorded periodically at intervals of ten minutes.

The collected data were stored in a database specially built for the research. For the quantitative variables, measures of central tendency (mean) were calculated.

The study complied with national and international ethical standards in research involving humans.

## Results

126 activities have been identified: 107 in the literature review\(^{(16)}\) and 19 activities were added during the field observation; mapped in 54 nursing interventions, according to the NIC. The activity “Attending administrative meetings” presented no NIC intervention that corresponded to this managerial activity inherent to nursing staff. It was decided to create the intervention “Administrative Meeting” to contemplate the activity.

The nursing interventions were analyzed and validated in a workshop composed of seven nurses/judges.

The panel of judges chose to group some interventions and activities, excluding others and as a result, the number of interventions and activities in nursing was reduced from 54 to 32 and from 126 to 92, respectively.

The list with the 32 interventions resulted in a measuring time instrument. The data in chart 1 represent the instrument proposed by the study. The nursing interventions were listed alphabetically and identified by code. The workday was divided into columns and at intervals of ten minutes.

After content validation, the instrument was tested by work sampling technique in 17 nursing professionals present in the five sectors and who consented to participate in the study, totalizing 720 observations. Figure 1 shows the percentage of time distribution in nursing interventions across the five sectors of the DIC. The nursing interventions considered had frequency ≥ 1%.

The percentage of time of the nursing staff of the five sectors of the DIC spent in nursing interventions was of 80%; in associated activities were employed 2% of the time and to personal activities were dedicated 18% of working time.

## Discussion

The scarcity of studies on nursing care and the lack of research on sizing in DIC constitute limitations of discussion in this study. The fact that it was performed only in one DIC is a methodological limitation.

This study contributes to nursing offering a list of NIC activities and interventions that are performed in the five sectors of the DIC addressed by this study, and providing a tool for measuring the workload which is validated and ready for practical application.

The standardization through the use of NIC was essential to operationalize the use of this instrument, optimizing the whole process, from collection and analysis until the comparison of distribution of nursing professionals’ time.

The content validation methodology through a workshop allowed the association of nurses with practical experience in DIC and nurses specialized in using NIC, which provided a critical view for improvement of the proposed instrument.

During the application of the instrument during a six-hour shift in each of the five sectors studied, all the interventions/activities in nursing performed during the practice of observed professionals were contained in the instrument, validating it in practice.

The work sampling has been considered an appropriate methodology to define the patterns of time distribution in nursing practice.\(^{(15)}\) Some as-
**Chart 1.** Instrument to measure the distribution of working time of nursing professionals in DIC

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Number of assistances in the period observed:

**Nursing Interventions**

1. Telephone follow up
2. Medication administration
3. Emotional support
4A. Examination assistance pre
4B. Examination assistance intra
4C. Examination assistance post
5. Assistance in self-care: feeding
6. Assistance in self-care: dressing/grooming
7. Health screening
8. Product evaluation
9. Pain management
10. Technology management
11. Infection control
12. Quality monitoring
13. Supply management
14. Environmental management: worker safety
15. Emergency care
16. Admission care
17. Postanesthesia care
18. Delegation
19. Staff development
20. Critical path development
21. Documentation
22. Case management
23. Preparatory sensory Information
24. Shift report
25. Family involvement promotion
26. Exercise promotion
27. Administration meeting
28. Staff supervision
29. Transport: interfacility
30. Health care information exchange
31. Emergency cart checking
32. Controlled substance checking

**Associated Activities**

33. Print labels
34. Clean and organize cabinets and countertops
35. Request repair/maintenance
36. Answering nonspecific phone calls
37. Locating companions
38. Leave the unit to make referrals of several kinds
39. Locating doctors

**Personal Activities**

40. Food/hydration
41. Elimination
42. Socialization
43. Rest
44. Answering personal phone calls
45. Solving personal issues outside the unit
46. Smoking
47. Accessing internet for self-interest
48. Delays
49. Studying during working hours

Aspects related with time distribution observed in pilot testing are interesting.

In the five sectors the most significant intervention was the “Examination assistance” at the moment of pre-examination/procedure (36% to 57% of the time distribution).

In contrast, similar studies\(^{9,11,12}\) in other areas pointed to the intervention “Documentation” as the most prevalent. In this study, the predominance of the intervention “Examination assistance” in relation to “Documentation” (3% to 11% of time) may be justified by the specificity of work dynamics in the DIC.
The associated activities had little representation in the distribution of time (2%) but the personal accounted for 18%. This indicates a productive time (82%) inside the DIC that is adequate because levels higher than 90% can represent elevation of costs, decreased quality of care and nursing results.\(^{(17)}\)

The identification of the distribution of time spent by nursing professionals in interventions/activities and presented in this study is still incipient due to the small number of observations.

Further studies applying the proposed instrument in different diagnostic centers and with a representative sample of professionals will enable the proposal of indicators of time spent on interventions/activities in nursing and therefore in the calculation of the workload in accordance to the care needs of users.

**Conclusion**

The instrument developed to measure working time in nursing is grounded in nursing interventions in Diagnostic Imaging Centers in the sectors of Tomography, Magnetic Resonance Imaging, Ultrasound, Mammography and Conventional Radiology, has been validated and is available for use.

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**Collaborations**

Cruz CWM and Gaidzinski RR declare to have contributed with the conception and the project, data analysis and interpretation; article drafting, critical review of intellectual content and final approval of the version to be published.

**References**

Nursing time in a diagnostic imaging center: development of an instrument

Perception of nursing professionals on sexuality in people with mental disorders

Abstract

Objective: To identify how nursing professionals perceive sexuality in people with mental disorders.

Methods: This is a quality research study based on the social representation theory. Data were collected through interviews with 7 nurses and 11 nursing assistants using a semistructured questionnaire and two analyses of daily situations.

Results: Testimonials revealed that nursing professionals perceived sexuality as sexual orientation, sexual role, or a manifestation disorder. Discipline and surveillance were the techniques used to control sexual behavior in the hospital environment.

Conclusion: Nursing professionals perceived the sexuality of people with mental disorders according to their own values, taboos, and prejudices, which indicated unpreparedness of nursing professionals concerning the sexuality of individuals receiving care for mental illnesses.

Keywords
Nursing; Nursing, practical; Nursing care; Sexuality; Mental health

Descritores
Enfermagem; Enfermagem prática; Cuidados de enfermagem; Sexualidade; Saúde mental

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**Introduction**

This study approached nursing professionals’ perceptions concerning sexuality in people with mental disorders. The origin of this research was based on our experience in nursing practice. Although nursing professionals have familiarity with the subject, sometimes their management is not appropriate. This fact became evident when nursing participants classified sexuality as a conduct or mental disorder, which sometimes is the object of nontherapeutic intervention.

We believe that human sexuality has not been adequately approached in nursing education. This could be seen in nursing education related only as a technical and mechanical model. The nursing undergraduate program curriculum often includes disciplines of technical activities and care management. Specific disciplines approaching human sexuality is not common in undergraduate courses in the field. Some disciplines cover limited aspects regarding this subject; however, they do not offer enough background for nursing daily activities, and as a result, several nursing professionals graduate without knowing such information and have some prejudices. Even in nursing practice, studies, discussions, and academic reflections regarding the socio-cultural aspects of human sexuality are scarce, and the only time that this topic is discussed is when it is considered a taboo.

The unpreparedness of nursing professionals in dealing with human sexuality was observed. They are prepared only to act in the biological model, particularly because sexuality is approached as a social, cultural, and subjective phenomenon.

In our daily practice so far, many nursing professionals feel uncomfortable discussing issues concerning this topic; they also avoid becoming involved with these aspects during care practice. Perhaps their own feelings and behaviors that involve sexuality could act as barriers to exploring any aspect related to sexuality in their patients.

This research attempted to present the view of nursing professionals concerning sexuality in people with mental disorders and also tried to create a critical and reflexive position of nursing care regarding sexual expression in such patients.

Our findings stimulated reflections about myths, taboos, and prejudices of professionals. In addition, we were able to observe the size and presence of censure in our daily practice about the topic and also promoted changes in behavior concerning sexuality in people living with mental disorders.

The goal of this study was to identify by social representation how nursing professionals perceive sexuality in people with mental disorders.

**Methods**

This exploratory descriptive study of a qualitative approach was based on the social representations theory. The study population was composed of nursing professionals from emergency departments, inpatient units, day clinics, psychogeriatric services, and alcohol and drug services. These nurses delivered care to individuals of both genders at the Center for Integrated Care for Mental Health, which is based in the city of São Paulo and is managed by a social health organization associated with the State Health Secretary.

Interviews were scheduled according to the nurses’ availability and were conducted at participants’ workplaces or in a private environment. Testimonials were recorded and were then transcribed.

To be included, nurses must be willing to participate and have at least one year of experience working in the psychiatric unit at the institution where this study was conducted.

Data were collected using interviews and a semistructured questionnaire that included individual social identification, six specific questions, and two situational analyses regarding sexuality in individuals with mental disorders, and in professionals. We designed questionnaires and situational analyses and, in addition, a pilot study with 8 nursing professionals who were not part of our sample. The study data were collected from March to June 2009. Based on the social representations theory, data were analyzed and categorized using anchoring and objectifying processes.
This study followed the national and international ethical and legal aspects of human subject research.

Results

A total of seven nurses and 11 nursing assistants were interviewed. Participants were of both genders, and all were directly involved in the care of people with mental disorders during three different shifts.

The time that the nursing professionals were working in the psychiatric unit varied from one to 16 years. Almost all participants were women, with a mean age of 27-47 years. All participants declared that they were heterosexual.

Based on analysis of testimonials, results were organized in the following categories:

Human sexuality is a preference, option, or sexual orientation

“What I understand as human sexuality is someone’s sexual preference. That is, the person could be heterosexual, homosexual, or bisexual” (Nurse 1).

“I think human sexuality is the sexual option of each person. Aside from being a man or woman, everyone chooses a sexual option. Men like men, and women like women” (Nurse assistant 1).

Human sexuality is a human need

“For me, human sexuality is a human basic need and it is also a need of every animal; everybody needs it in daily life” (Nurse 5).

“Besides being normal, sexuality is a necessity that every human has, physiologically or psychologically speaking” (Nurse assistant 10).

Sexuality is perceived within the institution as a disease

“Psychiatric patients have psychopathological changes that directly affect their libido. In general, they are erotic, disinhibited, and with expanded humor; therefore, a stronger and less tolerable approach is required in order to establish limits for such dysfunctional behaviors (Nurse 1).

“Sexuality becomes more evident when the patient is in a manic state; in other words, their sexuality is more intense” (Nurse assistant 6).

Sexuality of individuals is perceived by behaviors, clothes, and physical appearance

“They become very disinhibited, and sometimes they show their private parts. In general, women start showing the breast and men the penis” (Nurse 7).

“The way that patients interact with each other. We note how they start to communicate and approach each other, even their clothing style changes” (Nurse assistant 8).

Lack of therapeutic intervention when sexuality in people with mental disorders is perceived

“There is no private or group intervention for patients with such alterations. Intervention depends on each patient or nurse who is delivering care […]” (Nurse 7).

“There is no intervention. Sometimes when patients have greater libido, his/her physician asks to keep an eye on them to avoid them walking into others’ rooms. But a formal intervention is lacking” (Nurse assistant 2).

Hospital as an inappropriate environment for sexual expression

“[…] We try to explain to patients that we understand their sexual desire, but the moment that he/she chosen is not appropriate to express the desire. It’s not the right moment and not the right place, right? We respect that people can have a sexual relationship outside but not inside the hospital […]” (Nurse 2).

“We are not discriminating against them, but their sexual option must be expressed outside the hospital. Here is the place to be treated, not to [get into] emotional involvements” (Nurse assistant 3).

Surveillance, control, and punishment

“If I were the responsible nurse, I would punish that employee who saw patients having sexual intercourse and closed the door as if that act were normal in this environment. To me, that employee should be
punished and oriented on how to act in such situation” (Nurse 2).

“[...] During the night shift, a patient was caught in other room performing oral sex. The nursing team approached them, and then both patients were administratively discharged” (Nurse assistant 2).

Nursing team lacks the authority to act

“[...] I would report the case to the physician to check if medicines are influencing patient behavior” (Nurse 7).

“I would ask the responsible nurse what to do after explaining that the patient was [exhibiting] disinhibited behavior and was saying inappropriate words. Once, I approached my boss reporting such a situation, and she advised me to postpone that patient care at that moment…” (Nurse assistant 1).

Care delivery by a professional with the same gender as the patient

“I would ask a woman caregiver to approach a female patient who was erotized” (Nurse 2).

“I did not get into the room. I asked two partners working that day with me to approach the patient” (Nurse assistant 6).

Unpreparedness of professionals concerning the sexuality of people with mental disorders

“He was out of his mind and let the patient keep masturbating and called her “perverted.” Anyway, he was placing his own judgments upon the patient’s behavior, but it is important to remember that in psychiatry we must be impartial” (Nurse 2).

“I think [it] is not right for a professional to get sexually excited in front of a patient, because you are there to be a professional. So you are losing control of your professional side. Because if you get sexually excited after seeing a woman naked, you don’t have self-control” (Nurse assistant 3).

Discussion

This study had limitations in that it was carried out at single health service with a restricted population of a few professionals whose performance depended on strict institutional rules that, in our opinion, do not represent the concepts of a current paradigm of psychiatry care on patient sexuality. On the other hand, the results were in accordance with knowledge and contribution of advanced studies on the topic, which are scarce but are relevant to psychiatric nursing.

Our findings contributed to the knowledge of social representations and a value system for nursing professionals to manage sexuality in psychiatric care. These steps are the first to adapt practices concerning beliefs and sexual values of those receiving care or those who will receive care. In addition, this study has application in psychiatry nursing because it gives room for reflections concerning myths, taboos, and prejudices that must be pedagogically transformed to promote changes and to achieve quality in the care delivered.

The category “human sexuality is a preference, option, or sexual orientation” relates to the concept that human sexuality is understood as an attraction that a person feels for someone else, which relates closely to physical attraction or a desire by someone of the same sex, the opposite sex, or both sexes. The main idea of this category is the feeling directed to the person with whom someone desires to be emotionally or sexually involved.

In the category “human sexuality is a human need,” some participants stated that sexuality is a natural and basic need of all human beings (physiological and psychological). Respondents also reported that because sexuality is necessary, it is closely related to self-knowledge, personality, feelings, beliefs, and emotional relationships.

According to a previous study, it is possible that nursing professionals have a fragmented vision of human sexuality more related to a biological aspect, which is understood as a need, desire, preference, option, or sexual orientation. (4)

In the institution as a whole, sexuality was perceived as a disease. Caregivers included it as part of the patients’ psychopathology. Another study reported that to perceive sexual expression as part of the disease agrees with a biomedical model of health care focusing mainly on disease, clinical, and individualized care and...
healing. (5) Such a belief is based on a Cartesian discourse of separation and reduction of complexity phenomena contributing to reinforce sexuality as a biological phenomenon. The medical vision of disease characterization for adequate intervention remains strong and is mainly focused on the care of issues that involve human sexuality.(6)

In this study, nursing professionals denied sexuality in people with mental disorders. In the medical literature, this fact is justified by feelings of safety, protection, and comfort when determining sexuality as a disturbance, wrongdoing, disease, or illegitimate act.(7)

Hence, sexuality has been affected by invisibility and hiding. Although sexuality is presented at all times during professional practice with gestures and body movements, it is kept silent and uncovered in care practice. (8) In addition, it is treated as part of a mental disorder. Considering this judgment, individuals with mental disorders are not capable of expressing feelings or emotions from a sexual relationship as a normal activity because they are not able to regulate their emotions and passions, which are interpreted as antisocial and abnormal, therefore preventing them from being integrated into society.(9)

We noted that other simple and common behaviors expressing sexuality such as touching, kissing, hugging, making eye contact, or sporting a certain clothing style were considered out of context and were seen as psychopathologic in patients with mental disorders.

In the category “the sexuality of individuals is perceived by behaviors, clothes, and physical appearance,” sexual expression influenced each person’s behavior by creating an impression on the other person. In this way, effeminate men and masculine women in this study were thought to exhibit nonstandard behaviors in current society; therefore, they endured more prejudices because they did not fit society’s standards.

These perceptions are in accordance with a study that considered sexuality as a fundamental factor creating self-identity, which enables us to identify and differentiate each person within the universe of sexual diversity.(10)

Based on the subjective view of how sexuality is perceived in daily care practice, we verified that nursing professionals’ lack of knowledge of human sexuality could not promote therapeutic interventions on sexuality in people with mental disorders.

Having the biological concept of human sexuality, professors of nursing college programs exclude erotic and sensual aspects, giving room to doubts, prejudices, myths, and taboos. Such attitudes lead nursing professionals to work according to preconcepts; thus, they fail to intervene in other aspects of sexuality in the clinical environment.(11)

Nursing professionals at the institution in our study did not receive systematic guidelines, education, or supervision about the topic, so intervention criteria depended on each professional’s decision when facing a situation concerning sexual expression. The participants in this study identified the need to intervene when facing sexuality expression in people with mental disorders.

In the category “hospital as an inappropriate environment for sexual expression,” the participants expressed great concern regarding emotional and sexual manifestations in people with mental disorders during psychiatric internships.

Some nursing professionals reported observing and controlling patient sexuality. However, the technical and legal responsibilities that society and family impose on the institution state censure for sexuality in people with mental disorders, which agrees with another study.(12)

Therefore, because the hospital is considered an inappropriate place for sexual expression (as stated in the previous category), such expression is considered psychopathological. This concept appears in nursing professionals’ discourse, particularly because they consider a hospital as a place for protection, giving emphasis to medicines and a therapeutic environment.(13)

In the institution of our study, we perceived that professionals understand that sexuality must be surveilled, controlled, and punished. By fearing the sexual expression itself, the professional justifies the use of strength, control, and surveillance. Therefore, sexuality becomes an object of concern and analysis.(14)
Basically, the behavior of respondents facing the possibility of witnessing sexual expression in their patients was to observe, surveil, stop, set apart, and prevent sexual expression; and, whenever possible, punish by discharging from the psychiatric unit those who had sexual contact with other.

In the category “surveillance, control, and punishment,” some respondents suggested punishment to employees who did not approach the patient or intervene when faced with sexual expression between individuals with mental disorder.

The need for chemical or mechanical restraint was mentioned as a measure to control sexual expression in patients with mental disorders. In addition, almost all of the nursing professionals did not know the strategies to approach and intervene in a sexual situation, which shows that these professionals had limited techniques. In general, professionals facing such situations asked responsible nurses and/or the medical team about management techniques. However, most of the team members, including the nurse, only followed directions and nothing more; hence the category “nursing team lacks the authority to act.”

The main idea of the category “care delivery by a professional with the same gender as the patient” was that the professional delivering care is chosen according to the patient’s gender. In some testimonials, this strategy was used to protect the nursing team from patients with greater libido or hallucinations; therefore, the gender of the nursing professional was seen as a possible stimulus for sexual expression. Another important concept is that the professional could be “guilty” of the patient’s behavior, so care by someone with the same gender as that of the patient was standard. However, such a strategy does not apply to homosexuals; therefore, this approach could suggest prejudice because people tend to take heterosexual orientation for granted.

Although nursing professionals have permission to touch the patient’s body in order to deliver health care, nurses, nurse technicians, and nurse assistants perceive themselves as asexual; therefore, they ignore their own sexuality as well as that of the patient. Interestingly, these results agree with our study because we observed that some participants perceived themselves as asexual, which is why they ignored their patients’ sexuality. In addition, some professionals consider asexuality a professional behavior in the work environment.

Regarding the category “unpreparedness of professionals concerning sexuality in people with mental disorders,” we believe that this lack of knowledge in dealing with patients’ sexuality relates to the professionals’ education. Therefore, such unpreparedness was evident during situational analyses, which reflected the participants’ difficulty in coping with their daily practice when it involved sexuality in people with mental disorders.

By denying their own sexuality and desires, nurse professionals created a perception of purification and asexuality. It is important to highlight the participants’ difficulty with perceiving their body as care instruments and assuming their own sexuality. Such difficulties are justified because these professionals’ education program does not include human sexuality. In the curriculum, a traditional perspective is used in which assistance of health care delivery is mechanical, technical, and without judgment.

Institutions should include systematic discussions about sexuality in patients with mental disorders in permanent education programs and also at clinical and institutional supervision meetings.

**Conclusion**

We verified that prejudice, beliefs, value judgments, and stigma of nursing professionals has had a negative effect on patient care. Each participant understood and interpreted sexuality in people with mental disorders according to their cultural references and views. When facing a sexual situation regarding patients, the professional’s main approach was repression.

The difficulty of professionals in dealing with sexuality in individuals with mental disorders was clear in this study. Basically, management was linked to discipline. Although sexuality was the target of surveillance, control, and punishment, these behaviors must be reversed.

Interventions such as systematic training for nursing professionals are required to reduce
problems that may arise from the constant presence of sexuality in the care environment. These attitudes could transform professionals’ practices, concepts, and values.

Collaborations
Ziliotto GC and Marcolan JF were responsible for the study design and draft. They also analyzed and interpreted data and were solely responsible for final approval of proofs.

References


Qualify of life and daily activities performance after breast cancer treatment

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Abstract

Objective: To evaluate functional capability, quality of life, and correlation between these variables in women with breast cancer one year after cancer treatment.

Method: This descriptive, exploratory, cross-sectional, and quantitative study used the following instruments: a personal data form, Katz’s index and Lawton’s index to assess functional capability, and the EORTC QLQ-C30 and EORCT QLQ-BR23 to assess quality of life.

Results: Regarding functionality, cancer treatment negatively affected instrumental activities of daily life and compromised daily activities in women with breast cancer. These women also had impaired physical and psychosocial functions in leisure time and social participation. These events correlated with a worsening of quality of life.

Conclusion: In this study, women with breast cancer had changes in functional capability that negatively affected daily activities and social participation. This situation led to impairment in their quality of life.

Keywords
Oncologic nursing; Activities of daily living; Quality of life; Nursing research, Nursing assessment

Resumo

Objetivo: Avaliar a capacidade funcional, a qualidade de vida e a correlação entre essas variáveis, de mulheres com câncer mamário, que terminaram o tratamento oncológico há, no máximo, um ano.

Método: Estudo descritivo, exploratório, transversal e quantitativo por meio da aplicação de questionários: formulário com dados pessoais; Índice de Katz e Índice de Lawton para Capacidade Funcional; EORTC QLQ-C30 e EORCT QLQ-BR23 para Qualidade de Vida.

Resultados: Quanto à funcionalidade, este tratamento prejudicou a realização das Atividades Instrumentais de Vida Diária, o que compromete as atividades cotidianas destas mulheres. Houve, também, comprometimento nas funções físicas e psicossociais, nas atividades de lazer e de participação social, sendo que estas se correlacionaram com a piora da Qualidade de Vida.

Conclusão: Evidenciou-se que as mulheres com câncer de mama vivenciam alteração na capacidade funcional, o que prejudica a realização de suas atividades cotidianas e sua participação social, levando a um comprometimento na qualidade de vida.

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Introduction

Women with breast cancer may experience a feeling of disability because they are unable to manage daily activities such as housekeeping and are unable to care for themselves and their families. Among adverse effects of cancer treatment there is the difficulty for patients to perform occupational activities.\(^{(1,2)}\)

Occupational performance comprises daily activities and is divided into eight occupational areas: basic activities of daily life, instrumental activities of daily life, sleeping and resting, formal education, work, play, leisure, and social participation. These activities are related to the human needs of self-care, entertainment, and social participation. Because these activities are based on cultural values, they provide structure and meaning to people’s lives.\(^{(3)}\)

Functional capability integrates occupational performance. Functional assessment seeks to verify the disease level and injuries that cause the patient to avoid performing daily activities autonomously and independently (ie, performing daily activities without needing assistance). Therefore, functional assessment enables development of a plan for adequate care.\(^{(4-6)}\)

Functional capability is associated with the human ability to perform basic activities and is instrumental in maintaining independence in daily life. It is characterized as the efficiency to execute daily life tasks and is linked to preservation of motor and cognitive skills being directly related to quality of life.\(^{(5)}\)

It is well known that breast cancer treatment includes chemotherapy, radiotherapy, and/or surgery. All could cause adverse effects that sometimes cannot be avoided. In addition, when management is not adequate, the occupational performance of patients could be affected, resulting in worsening of quality of life.\(^{(1,7)}\)

Changes in physical and emotional functions and, above all, in functional capability also impair quality of life in women who have undergone breast cancer treatment. Functional capability is characterized as the efficiency to perform daily life tasks and depends on preservation of motor and cognitive skills being directly related to quality of life.\(^{(7,8)}\)

Historically, disease-free survival and global survival constitute the main parameters in the evaluation of results of cancer treatment. However, they became evidently insufficient. In comparison of different therapies, quality of life is an important parameter that can also help physicians and patients decide which therapy is more suitable. For this reason, the US Food and Drug Administration recommends a quality-of-life assessment in clinical trials for approval of new antineoplastic agents because of involvement of physical, emotional, and social functions particularly during and after treatment.\(^{(9,10)}\)

Quality of life has been greatly important for women with breast cancer and biopsychosocial aspects problems imposed on them, particularly concerning treatment planning and rehabilitation. Quality-of-life assessment for such patients must consider aspects involving disease improvement, stabilization, or worsening based on treatment that includes physical, psychological, and social well-being.\(^{(10-13)}\)

This study hypothesis is that the effect generated by diagnosis and implications of treatments could affect functional capability and impair occupational performance because of difficulty in performing daily life activities, therefore causing important changes in quality of life. The objective of this study was to evaluate quality of life and functional capability of women with breast cancer one year after treatment with chemotherapy and/or radiotherapy, and to verify correlations among variables.

Methods

This exploratory, cross-sectional, and quantitative study was carried out at a physical and psychosocial rehabilitation center for women with breast cancer. This center is organized in a multidisciplinary way and is composed of a nursing team, physiotherapists, occupational therapists, psychologists, and nutritionists.

Inclusion criteria were women who underwent mastectomy and participated in a center rehabilitation service, those who completed chemotherapy and/or radiotherapy no more than one year ago, and those who did not have metastasis or active disease.

To measure the sample of this study, we investigated publications of clinical data regarding vari-
ables used. Therefore, the study by Osoba et al., which followed up on patients with cancer after initiation of chemotherapy treatment, was adopted as the basis for this investigation. The EORTC QLQ-C30 (European Organisation for Research and Treatment of Cancer Quality of Life) questionnaire was used.

This study compared the SF-36 questionnaire, which is considered the gold standard, with the EORTC QLQ-C30 in both groups of cancer patients. The variation, which was lower than ten points between scores obtained using the EORTC QLQ-C30, did not represent a significant clinical worsening or improvement. On the other hand, the opposite occurred when a variation higher than ten was found, indicating a significant clinical difference. In addition, a difference between ten and 20 points was considered moderate, and a difference higher than 20 points represented a high clinical change between the first and second assessment.\(^{(14)}\)

For this reason, the value of ten was used as the coefficient of variation. As defined in the medical literature, the reliability coefficient was 5% and statistical power was 95%. The sample value was obtained from 42 women.

During data collection, from January to July 2010, a total of 123 women initiated treatment in the service, but after the sample was calculated, 42 were invited to participate in the study.

Data were collected, and some instruments were used, including a personal data form that included age, formal educational level, marital status, leisure activities, occupation, living arrangements, and treatments performed. The Katz’s index was used to assess functional capability for basic daily life activities and the Lawton’s index to assess instrumental activities of daily life.

The score in Katz’s index applied in each question varied from zero to one. The total value was obtained, summing scores of all items. Calculations were done according to the questionnaire, and in the end, the total value was characterized by dependent participants and independent participants. The score in Lawton’s index for each question varied from one to three. After all scores were summed, participants were categorized as: dependent (nine to 13 points), semidependent (14 to 22 points), and independent (over 22 points).

Quality-of-life assessment was done using the EORTC-QLQ-30 questionnaire and a specific model for women with breast cancer - EORTC-BR 23 translated into Portuguese. This instrument has 30 items with 16 domains that create four scales: a general health status scale and quality of life (one domain; two items); a functional scale (five domains; 15 items); a symptoms scale (nine domains; 12 items); and a financial difficulties scale (one domain; one item).

The EORTC-QLQ model is multidisciplinary, and the self-administered questionnaire includes specific symptoms of cancer, treatment adverse effects, psychological distress, physical functioning, social interaction, body image, sexuality, global health, and satisfaction with medical care. For this reason, these characteristics turned this questionnaire the most indicated to measure quality of life in patients with cancer.\(^{(11,13)}\)

The QLQ-C30 questionnaire had units defined as items groups that are not approached or not explored enough in the main questionnaire, although it is relevant for a quality-of-life assessment of specific groups.\(^{(11)}\)

The QLQ-BR23 unit was created specifically for women with breast cancer. This unit has 23 questions divided into two groups: a functional scale and a symptoms scale.\(^{(13)}\)

Data collection was carried out in the center during the activities period. Participants answered questionnaires at preestablished times after the investigator read the questions out loud.

To analyze data, all information was first gathered and organized using Microsoft Office Excel 2007 spreadsheet. Sociodemographic data were evaluated using a descriptive analysis-of-form variables to characterize the sample.

To address aims proposed in this study, a descriptive statistical analysis of sociodemographic, clinical, and therapeutic data of QLQ-C30 was done using mean calculation, standard deviation, and Pearson’s correlation coefficient between Lawton’s index and quality-of-life instruments.
This study followed the national and international ethical and legal aspects of human subject research.

**Results**

Sociodemographic characterization and data related to work, leisure activity, and cancer treatment are presented in tables 1 and 2.

**Table 1. Distribution of participants related to age, marital status, and formal education**

<table>
<thead>
<tr>
<th>Variable</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
</tr>
<tr>
<td>35-39</td>
<td>2(4)</td>
</tr>
<tr>
<td>40 – 44</td>
<td>3(7)</td>
</tr>
<tr>
<td>45-49</td>
<td>12(30)</td>
</tr>
<tr>
<td>50-54</td>
<td>16(38)</td>
</tr>
<tr>
<td>55-59</td>
<td>6(14)</td>
</tr>
<tr>
<td>60+</td>
<td>3(7)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>1(2)</td>
</tr>
<tr>
<td>Married</td>
<td>31(73)</td>
</tr>
<tr>
<td>Cohabitant</td>
<td>4(10)</td>
</tr>
<tr>
<td>Divorced</td>
<td>0(0)</td>
</tr>
<tr>
<td>Widow</td>
<td>6(15)</td>
</tr>
<tr>
<td>Formal Education</td>
<td></td>
</tr>
<tr>
<td>Incomplete elementary school</td>
<td>10(23)</td>
</tr>
<tr>
<td>Complete elementary school</td>
<td>10(23)</td>
</tr>
<tr>
<td>Incomplete high school</td>
<td>6(15)</td>
</tr>
<tr>
<td>Complete high school</td>
<td>10(23)</td>
</tr>
<tr>
<td>Incomplete college degree</td>
<td>0(0)</td>
</tr>
<tr>
<td>Complete college degree</td>
<td>6(15)</td>
</tr>
</tbody>
</table>

Leisurely activities reported by 32 (76%) of women were joyrides, walks, visits to a family member, the internet, embroidering, reading, and cooking. They also reported that people who join them in such activities were sons and daughters (90%), husband (70%), other family members (20%), and friends (20%).

Mean duration of surgery was 6 ±2.8 months. Highest duration was 11 months, and lowest was less than two months. It important to emphasize that all participants had finished treatment such as chemotherapy and/or radiotherapy, and some patients underwent more than one procedure.

The functional capability assessment was divided into basic activities of daily life and instrumental activities of daily life according to instruments. In basic activities of daily life, all participants had maximal point (six), being classified as independent.

Lawton’s index had a mean of 21.8 ±3.1, and women were classified as semi-independent. When evaluated separately, 56% of women were classified as semi-independent, that is, they needed someone to help them at any moment to perform activities.

Participants had impairment on the physical function domain and social function, with a mean of 60.5 and 64.5, respectively. The emotional function domain showed the most relevant change, with a mean of 48.4. The other domains had mild changes (Table 3).

Table 4 shows that impairments were mild, but we observed that all domains and standard deviations were high, therefore indicating a greater variability in points achieved between maximal and minimal scores. Some women did not report these symptoms, and others reported them with strong intensity.
of EORTC-QLQ-C30 presented a moderate correlation and positive functional capability, which indicated that more impairment in these domains yielded more difficulties in instrumental activities of daily life. In addition, a moderately inverse correlation was found between dyspnea and insomnia.

Correlation between Lawton’s index and EORTC-QLQ-BR23 was higher than EORTC-QLQ-C30 (Table 5). In the domains future perspectives, breast symptoms, and hair loss, a

Table 3. Distribution of mean and standard deviation of participants in EORTC-QLQ-C30

<table>
<thead>
<tr>
<th>Scale</th>
<th>Domain</th>
<th>Mean ± standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global health mean and quality of life</td>
<td>MGS – QV</td>
<td>70.1±21.6</td>
</tr>
<tr>
<td>Functional scale</td>
<td>Physical function</td>
<td>60.5±23.9</td>
</tr>
<tr>
<td></td>
<td>Performing roles</td>
<td>80.5±20.6</td>
</tr>
<tr>
<td></td>
<td>Emotional function</td>
<td>48.4±22.2</td>
</tr>
<tr>
<td></td>
<td>Cognitive function</td>
<td>73.8±20.2</td>
</tr>
<tr>
<td></td>
<td>Social function</td>
<td>64.5±30.9</td>
</tr>
<tr>
<td>Symptoms scale</td>
<td>Fatigue</td>
<td>40.9±26.3</td>
</tr>
<tr>
<td></td>
<td>Loss of appetite</td>
<td>15.5±23.8</td>
</tr>
<tr>
<td></td>
<td>Insomnia</td>
<td>21.9±31.7</td>
</tr>
<tr>
<td></td>
<td>Pain</td>
<td>28.9±31.5</td>
</tr>
<tr>
<td></td>
<td>Nausea and vomiting</td>
<td>8.5±10.6</td>
</tr>
<tr>
<td></td>
<td>Dyspnea</td>
<td>3.5±9.8</td>
</tr>
<tr>
<td></td>
<td>Constipation</td>
<td>20.6±9.8</td>
</tr>
<tr>
<td></td>
<td>Diarrhea</td>
<td>12.7±27.4</td>
</tr>
</tbody>
</table>

Table 4. Descriptive analysis of domains of functional scale and symptoms of EORTC-QLQ-BR23

<table>
<thead>
<tr>
<th>Scale</th>
<th>Domain</th>
<th>Mean±standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Functional scale</td>
<td>Body image</td>
<td>32.6±37.1</td>
</tr>
<tr>
<td></td>
<td>Sexual function</td>
<td>39.7±23.1</td>
</tr>
<tr>
<td></td>
<td>Sexual satisfaction</td>
<td>45.2±17.1</td>
</tr>
<tr>
<td></td>
<td>Future perspective</td>
<td>36.1±24.7</td>
</tr>
<tr>
<td></td>
<td>Adverse effects of systemic therapy</td>
<td>26.8±17.9</td>
</tr>
<tr>
<td>Symptoms scale</td>
<td>Breast symptoms</td>
<td>37.9±23.1</td>
</tr>
<tr>
<td></td>
<td>Arm symptoms</td>
<td>26.1±21.4</td>
</tr>
<tr>
<td></td>
<td>Hair loss</td>
<td>6.7±13.4</td>
</tr>
</tbody>
</table>

Legend: n=42

In correlation analysis between functional capability and quality of life, we observed that the physical function and emotional function domains
moderate and positive correlation occurred; in other words, more impairment in the categories yielded more difficulties in functional capability. There was a moderate correlation but of inverse function for sexual satisfaction. Such results indicate that women who reported low sexual satisfaction had more impairment in functional capability. In other domains, this correlation was weak.

Correlation analysis of functional capability related to questions approached in Katz’s index was not performed because participants did not have impairments in these items.

Cronbach’s alpha was calculated for each instrument to evaluate internal consistency. The results of EORTC QLQ-C30 and EORTC QLQ-Br23 were 0.73 and 0.82, respectively. Functional capability scale values concerning Katz’s index and Lawton’s index were 1.0 and 0.97, respectively.

Discussion

Our study findings showed that women with breast cancer had limitations in performing daily activities of living such as housework, self-care, and other activities. Basic activities of daily life comprise self-caring such as dressing, eating, and maintaining personal hygiene. Instrumental activities are those that need higher physical effort because they support daily life at home and within society. Such activities often require more emotional, cognitive, and physical functions. This study found high variability in the quality of life of patients who did not have changes in global quality of life but presented changes in some aspects of quality of life.

Results could be influenced by the fact that all participants were part of a rehabilitation center where self-care was easy and guidance given offered the opportunity for them to change experiences, which helped their biopsychosocial recovery. This could be a limitation of our study; time could also be a limitation because it could interfere with the results due to short- and long-term adverse effects of treatment (these become more expressive later on). (15,16)

In this sense, several studies indicate that breast cancer treatment causes many changes in the patient’s life concerning autonomy and independence, which could generate psychosocial problems. (1,17-20) In accordance with other studies, (21,22) women reported that dependency and loss of identity could cause anxiety and fears. These feelings could impair their emotional function and quality of life, which is intensified among those who have undergone cancer treatment.

Breast cancer has an important influence on women’s emotional aspects because it changes their autonomy and independence. (20) Another factor is the closeness, real or idealized, of death and incapability, which cause fear, anxiety, shame, and feelings of discrimination. All of these factors could lead to emotional impairments. (22)

At least one third of patients who received cancer treatment will present distress (21) that will negatively reflect their quality of life. (22)

-20 pain. (22) It is important to highlight that even if no symptoms were reported, close attention to the rehabilitation of women with breast cancer is critical to avoid negative influences in their quality of life.

Future perspective is considered a limitation in quality of life because it is close to the end of treatment. Some researchers have shown that concern about the future, close or distant, happens because of fear of disease recurrence. This feeling is more intense in the period close to the date of follow-up examinations. (22) In addition, patients worry about possible complications associated with treatment such as dehiscences and infections, among others. (18,19)

The results of our study can contribute to management of difficulties faced by women with breast cancer in a more integrative way. It also can help health professionals better understand the impact that this disease and its treatment have on women’s daily living activities, especially because at times these women totally abandon their activities, therefore causing worsening quality of life.

Our study shows that reduction of the adverse effects of breast cancer treatment can lead
to positive and effective reconstruction of occupational life in women who have undergone cancer treatment.

The relevance of participants to be part of a rehabilitation center and receive advice on how to continue with their basic activities of daily life, even in the postoperative period, must be mentioned. In addition, these approaches stimulate maintenance of self-care. Findings of our study also suggest that compared with data in the medical literature, adherence of the participant to the integral rehabilitation service, including a multidisciplinary team, favored presentation of few complaints related to disease symptoms and less difficulties after cancer treatment.

In addition, after completion of cancer treatment, women were able to begin life reconstruction and become more independent, which improved their quality of life.

Conclusion

Breast cancer negatively affected the daily living activities and occupational performance of participants in instrumental activities such as cleaning house, cooking, using domestic instruments, taking medication, taking care of others, managing money, shopping, and using public or private transportation. Participants also had difficulty with engaging in leisure activities.

Acknowledgments

We acknowledge the Coordination for the Improvement of Higher Education Personnel (CAPES, acronym in Portuguese).

Collaborations

Fangel LMV, Panobianco MS, Kebbe LM and Almeida AM contributed to the design of the project and analysis and interpretation of the data. They also were responsible for drafting and critically reviewing the manuscript, and performing final approval of proofs. Gozzo TO contributed to drafting and reviewing the manuscript, and performing final approval of proofs.

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Assessment of cardiovascular risk in patients with chronic kidney disease according to Framingham’s criteria

Avaliação do risco cardiovascular de pacientes renais crônicos segundo critérios de Framingham

Cláudia Bernardi Cesarino
Patricia Peruche Borges
Rita de Cássia Helú Mendonça Ribeiro
Daniele Fávaro Ribeiro
Luciana Kusumota

Abstract
Objective: To identify the profile of patients with chronic kidney disease attending a hemodialysis service and estimate the risk of future cardiovascular events over a period of ten years.

Methods: Cross-sectional study with a sample of 242 patients with chronic kidney disease. Cardiovascular risk was assessed using the Framingham Risk Score.

Results: The most prevalent risk factors for cardiovascular disease were: hypertension (90.49%), sedentariness (80.16%), and smoking (51.23%). Cardiovascular risk in relation to the variables gender and family income presented a statistical difference (p<0.05). Only 0.8% of the patients presented a high risk of cardiovascular disease; 28.8% presented average risk and 70.2% low cardiovascular risk.

Conclusion: Data show low cardiovascular risk in patients with chronic kidney disease.

Keywords
Clinical nursing research; Nursing assessment; Nursing, practical; Risk factors; Chronic disease

Resumo
Objetivo: Identificar o perfil do paciente com doença renal crônica em um serviço de hemodiálise, e a probabilidade do risco de futuros eventos cardiovascular no período de dez anos.

Métodos: Estudo transversal com amostra de 242 pacientes com doença renal crônica. A avaliação do risco cardiovascular foi através do Escore de Risco de Framingham.

Resultados: Os fatores de risco para doenças cardiovasculares mais prevalentes foram: hipertensão arterial (90,49%), sedentarismo (80,16%), tabagismo (51,23%). O risco cardiovascular em relação às variáveis gênero e renda familiar apresentou diferença estatística (p<0,05). Apenas 0,8% dos pacientes apresentaram alto risco de doença cardiovascular, 28,8% médio risco e 70,2% baixo risco cardiovascular.

Conclusão: Os dados apontaram para baixo risco cardiovascular nos pacientes renais crônicos.

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Conflicts of interest: there are no conflicts of interest.
Assessment of cardiovascular risk in patients with chronic kidney disease according to Framingham’s criteria

Introduction

Chronic kidney disease (CKD) is the progressive and irreversible loss of function of the kidneys. (1) This disease is currently a severe public health problem worldwide and is considered an epidemic with an alarming growth rate. (2) Mortality due to CKD is 20 times greater than in the population in general, while cardiovascular disease is the most common cause of death. (3)

There is a direct relationship between the degree of kidney dysfunction and cardiovascular risk (CVR). The presence of proteinuria or microalbuminuria is a strong CVR, while the main causes of kidney diseases are diabetic nephropathy and hypertensive nephrosclerosis, accelerated by smoking and dyslipidemia. Thus, increased CVR among patients with CKD is secondary to the accumulation of these risk factors. (4)

CVR factors include: hypertension, dyslipidemia, presence of left ventricular hypertrophy, obesity, diabetes mellitus (DM) and some lifestyle-related habits (high-calorie diet, saturated fats, high cholesterol, salt, alcohol consumption, smoking and sedentariness). (5-7) In addition to these, there are non-traditional CVR factors, such as inflammation, oxidative stress, persistent infection, proteinuria and hyperphosphatemia. (8)

It was possible, with the Framingham study, to clarify and correlate CVR factors, enabling the identification of high risk patients, encouragement of therapy adherence, and the calibration of efforts to reduce risk, seeking to reduce its incidence and the consequent rates of morbidity and mortality. (9) The instrument most frequently used in clinical practice to compute and estimate absolute CVR is the Framingham Risk Score (FRS), a scale capable of estimating one’s risk of developing Cardiovascular Diseases (CVD) over a period of ten years. (10) Recognized worldwide and widely applied to stratify risk, it enables directing specific groups of patients who can benefit from medication therapy as a primary intervention to prevent CVD. (11) The objective in this context was to identify CKD patients in a hemodialysis service to estimate the risk probability of future CVD over a period of ten years.

Methods

This cross-sectional study was conducted in the Nephrology unit of the General Hospital, Fundação Faculdade Regional de Medicina de São José do Rio Preto, SP, Brazil from August to December 2011.

A total of 242 patients with chronic kidney disease who met the following criteria participated in the study: being 18 years old or older, attending hemodialysis treatment in the aforementioned hospital between August and December 2011, having no mental deficits, and consenting to participate in the study.

Data were collected through interviews with patients during hemodialysis sessions, addressing data concerning the patients’ socio-demographic and economic profiles, and consultation of medical files to obtain clinical, laboratory and anthropometric data.

The collected data were transferred to a Microsoft® Excel spreadsheet. Frequency tables were used for the categorical variables (gender, age, ethnicity, marital status, education, years of schooling, occupation, family income) and descriptive statistics (average, standard deviation) for the continuous variables. The Chi-square test was used for the analysis of association among the following variables: risk factors, gender, age, family income, and years of schooling. A level of significance of p<0.05 was adopted.

The Framingham Risk Score was used to assess cardiovascular risk. Each variable in this scale has value ranges that present specific positive or negative scores. The total score takes into account the following variables: gender, age, smoking, diabetes mellitus, high-density lipoprotein, total cholesterol, systolic blood pressure and diastolic blood pressure. The score obtained corresponds to the likelihood of cardiovascular diseases occurring in the next ten years, expressed as a percentage.

Hence, the individuals are classified in the following categories: low risk, which refers to a probability lower than 10% of cardiovascular events occurring in ten years; average risk, between 10% and 20%; and high risk, greater than 20%.
The study met Brazilian and international ethical standards concerning research involving human subjects.

**Results**

We note a predominance of males, age ranging from 18 and 92 years old, average of 57.45 ± 15.68 years, average years of schooling of 6.27 ± 3.56 years, and average family income of 3.25 ± 3.49 times the minimum wage. Table 1 presents the sample’s characteristics according to socio-demographic variables, by gender.

Data in table 2 show a greater concentration of total cholesterol among females, as well as HDL, LDL and triglycerides. In regard to central distribution of waist fat, males presented a higher average waist circumference. In relation to uncontrolled blood pressure, 31.4% of the patients presented uncontrolled systolic blood pressure (≥ 140mmHg) and 20.24% presented uncontrolled diastolic blood pressure.

**Table 2.** Clinical, laboratory and anthropometric characteristics between genders

<table>
<thead>
<tr>
<th>Variables</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cholesterol (mg/dl)</td>
<td>152.04 ±42.13</td>
<td>182.35 ±48.31</td>
<td>165.27±47.29</td>
</tr>
<tr>
<td>HDL (mg/dl)</td>
<td>39.89 ±11.02</td>
<td>45.92 ±18.16</td>
<td>42.52±14.84</td>
</tr>
<tr>
<td>LDL (mg/dl)</td>
<td>79.55± 30.38</td>
<td>102.77 ±37.39</td>
<td>89.75±35.39</td>
</tr>
<tr>
<td>Triglycerides (mg/dl)</td>
<td>163.72±116.38</td>
<td>177.8 ±109.77</td>
<td>167.61±108.63</td>
</tr>
<tr>
<td>SBP (mmHg)</td>
<td>130.07 ±18.8</td>
<td>127.04 ±17.59</td>
<td>128.76±18.34</td>
</tr>
<tr>
<td>DBP (mmHg)</td>
<td>79.48 ±11.52</td>
<td>79.42 ±19.28</td>
<td>79.46±10.61</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>1.70 ±0.08</td>
<td>1.59± 0.07</td>
<td>1.66 ±0.09</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>71.57 ±14.25</td>
<td>61.96 ±13.93</td>
<td>67.40 ±14.87</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>24.65 ±5.00</td>
<td>24.90 ±5.38</td>
<td>24.65 ±4.9</td>
</tr>
<tr>
<td>WC (cm)</td>
<td>97.68 ±13.95</td>
<td>93.55±14.47</td>
<td>95.93±17.93</td>
</tr>
</tbody>
</table>

Legend: Results presented as average ± standard deviation; SBP – systolic blood pressure; DBP -diastolic blood pressure; BMI – body mass index; WC – waist circumference

Table 3 shows that hypertension, sedentariness and smoking were the predominant risk factors found in the studied population and were statistically high in males, as were diabetes and dyslipidemias.

When considering the classification of cardiovascular risk (CVR) according to the Framingham score, we observe that low cardiovascular risk predominates (Table 4). The comparison between genders and CVR presented a significant difference (p<0.001). When the socio-demographic variables were compared in the association of genders together with cardiovascular risks, only the family income variable (p=0.004) presented a significant difference. The variables age (p=0.161), ethnicity (p=0.38), marital status (p=0.128) and years of schooling (p=0.130) did not present statistically significant differences in relation to gender and CVR.

**Table 3.** Risk factors for cardiovascular diseases, by gender, among patients with chronic kidney disease

<table>
<thead>
<tr>
<th>Risk Factors</th>
<th>Male n(%)</th>
<th>Female n(%)</th>
<th>Total n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>122(50.41)</td>
<td>97(40.08)</td>
<td>219(90.49)</td>
</tr>
<tr>
<td>Diabetes Mellitus</td>
<td>52(21.48)</td>
<td>50(20.66)</td>
<td>102(42.14)</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>51(21.07)</td>
<td>46(19.00)</td>
<td>97(40.08)</td>
</tr>
<tr>
<td>Smoking</td>
<td>88(36.36)</td>
<td>36(14.87)</td>
<td>124(51.23)</td>
</tr>
<tr>
<td>Obesity (BMI &gt; 30 kg/m²)</td>
<td>16(6.6)</td>
<td>17(7.02)</td>
<td>33(13.63)</td>
</tr>
<tr>
<td>WC (cm) *</td>
<td>30(12.39)</td>
<td>78(32.23)</td>
<td>108(44.6)</td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irregular physical activity/ Sedentariness</td>
<td>100(41.32)</td>
<td>94(38.84)</td>
<td>194(80.16)</td>
</tr>
</tbody>
</table>

Legend: *WC – Waist circumference/ Male WC considered >102 cm and Female WC considered >88cm

Assessing the simultaneity of risk factors for CVD, we observe that the patients whose scores
Table 1. Description of socio-demographic variables of patients with chronic kidney disease according to gender

<table>
<thead>
<tr>
<th>Variable</th>
<th>Male n(%)</th>
<th>Female n(%)</th>
<th>Total n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender*</td>
<td>137(56.6)</td>
<td>105(43.4)</td>
<td>242(100)</td>
</tr>
<tr>
<td>Ethnicity**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>84(34.7)</td>
<td>63(26)</td>
<td>147(60.7)</td>
</tr>
<tr>
<td>Non-Caucasian</td>
<td>83(34.3)</td>
<td>12(4.9)</td>
<td>95(39.2)</td>
</tr>
<tr>
<td>Age (years)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 40</td>
<td>19(7.9)</td>
<td>16(6.6)</td>
<td>35(14.5)</td>
</tr>
<tr>
<td>41 to 60</td>
<td>59(24.4)</td>
<td>39(16.1)</td>
<td>98(40.5)</td>
</tr>
<tr>
<td>Older than 60</td>
<td>59(24.4)</td>
<td>50(20.6)</td>
<td>109(45)</td>
</tr>
<tr>
<td>Marital status**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>14(5.8)</td>
<td>8(3.3)</td>
<td>22(9.1)</td>
</tr>
<tr>
<td>Married</td>
<td>35(14.5)</td>
<td>27(11.1)</td>
<td>62(25.6)</td>
</tr>
<tr>
<td>Widowed</td>
<td>2(0.8)</td>
<td>14(5.8)</td>
<td>16(6.6)</td>
</tr>
<tr>
<td>Divorced</td>
<td>4(1.6)</td>
<td>3(1.3)</td>
<td>7 (2.9)</td>
</tr>
<tr>
<td>Stable union</td>
<td>2(0.8)</td>
<td>2(0.8)</td>
<td>4(1.6)</td>
</tr>
<tr>
<td>Did not answer</td>
<td>80(33)</td>
<td>51(21.1)</td>
<td>131(54.1)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illiterate</td>
<td>5(2.1)</td>
<td>11(4.5)</td>
<td>16(6.6)</td>
</tr>
<tr>
<td>Non-illiterate</td>
<td>132(54.5)</td>
<td>94(38.8)</td>
<td>226(93.4)</td>
</tr>
<tr>
<td>Years of schooling (years)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>5(2.1)</td>
<td>11(4.5)</td>
<td>16(6.6)</td>
</tr>
<tr>
<td>1-4</td>
<td>57(23.6)</td>
<td>49(20.2)</td>
<td>106(43.8)</td>
</tr>
<tr>
<td>5-8</td>
<td>21(8.7)</td>
<td>9(3.7)</td>
<td>30(12.4)</td>
</tr>
<tr>
<td>9-11</td>
<td>30(12.4)</td>
<td>20(8.3)</td>
<td>50(20.7)</td>
</tr>
<tr>
<td>&gt;12</td>
<td>15(6.2)</td>
<td>13(5.4)</td>
<td>28(11.6)</td>
</tr>
<tr>
<td>Other</td>
<td>9(3.7)</td>
<td>3(1.2)</td>
<td>12(4.9)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disability retirement</td>
<td>45(18.6)</td>
<td>29(12)</td>
<td>74(30.6)</td>
</tr>
<tr>
<td>Full retirement age/time of service</td>
<td>45(18.6)</td>
<td>21(8.7)</td>
<td>66(27.3)</td>
</tr>
<tr>
<td>Compensation for temporary disability</td>
<td>22(9)</td>
<td>24(9.9)</td>
<td>46(19)</td>
</tr>
<tr>
<td>Pension</td>
<td>-</td>
<td>6(2.4)</td>
<td>6(2.4)</td>
</tr>
<tr>
<td>Have a job</td>
<td>24(9.9)</td>
<td>25(10.3)</td>
<td>49(20.2)</td>
</tr>
<tr>
<td>Did not answer</td>
<td>1(0.4)</td>
<td>-</td>
<td>1(0.4)</td>
</tr>
<tr>
<td>Income (times MW)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤1.0</td>
<td>29(12)</td>
<td>30(12.4)</td>
<td>59(24.4)</td>
</tr>
<tr>
<td>1.1 - 3.0</td>
<td>55(22.7)</td>
<td>43(17.8)</td>
<td>98(40.5)</td>
</tr>
<tr>
<td>3.1 - 6.0</td>
<td>32(13.2)</td>
<td>14(5.8)</td>
<td>46(19)</td>
</tr>
<tr>
<td>6.1-10</td>
<td>6(2.5)</td>
<td>3(1.2)</td>
<td>9(3.7)</td>
</tr>
<tr>
<td>&gt;10</td>
<td>6(2.5)</td>
<td>1(0.4)</td>
<td>7(2.9)</td>
</tr>
<tr>
<td>Did not report</td>
<td>9(3.7)</td>
<td>14(5.9)</td>
<td>23(9.5)</td>
</tr>
</tbody>
</table>

Legend: *p<0.001 – significant difference between gender and cardiovascular risk factors; **p>0.05 – this variable did not show significant difference in relation to gender and cardiovascular risk factors; ***Family income (MW – Minimum Wage R$ 622.00, currently) presented a significant difference between gender and cardiovascular risk factors p= 0.004
corresponded to low risk presented a larger number of risk factors when compared to patients who obtained other scores (Table 5).

Table 5. Simultaneity of risk factors for cardiovascular diseases, according to the Framingham score

<table>
<thead>
<tr>
<th>Number of risk factors</th>
<th>Framingham score</th>
<th>Low risk n(%)</th>
<th>Average risk n(%)</th>
<th>High risk n(%)</th>
<th>Impossible to compute n(%)</th>
<th>Total n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
<td>2(0.8)</td>
<td>-</td>
<td>-</td>
<td>1(0.4)</td>
<td>3(1.2)</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>23(9.5)</td>
<td>-</td>
<td>-</td>
<td>4(1.6)</td>
<td>27(11.1)</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>39(16.1)</td>
<td>10(4.1)</td>
<td>-</td>
<td>6(2.4)</td>
<td>55(25.9)</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>46(19.0)</td>
<td>23(9.5)</td>
<td>-</td>
<td>2(0.8)</td>
<td>71(29.3)</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>26(10.7)</td>
<td>21(8.6)</td>
<td>1(0.4)</td>
<td>2(0.8)</td>
<td>50(20.6)</td>
</tr>
<tr>
<td>5 or more</td>
<td></td>
<td>15(6.1)</td>
<td>18(7.4)</td>
<td>1(0.4)</td>
<td>2(0.8)</td>
<td>36(14.8)</td>
</tr>
</tbody>
</table>

**Discussion**

A predominance of the male gender and low family income among patients with chronic kidney disease is similar to that found by the Census 2011 conducted by the Brazilian Society of Nephrology. The predominant age group in this study was above 40 years old, represented by 85.5% of the sample, which corroborates a study conducted in Campinas, SP, Brazil in which 75% of the population undergoing hemodialysis were adults of a productive age.

In relation to ethnicity, there was a prevalence of Caucasians, according to data reported in the literature, showing that chronic kidney disease has more frequently affected Caucasian individuals.

Cardiovascular diseases are the main cause of death among patients with chronic kidney disease undergoing hemodialysis. The greatest risk factor for cardiovascular mortality is hypertension. In this study, 31.4% of the patients presented systolic blood pressure and 20.24% presented diastolic blood pressure outside the normal range; most were male. In relation to the prevalence of abnormal blood pressure found in this study, it was greater among males (50.41%) than among females (40.08%), data that are in agreement with a study conducted in the city of São Luís, Maranhão, Brazil.

Dyslipidemias are among the main risk factors for the development of coronary artery disease. In this sense, data obtained in this study showed that the prevalence of dyslipidemias was greater among males, which is in agreement with epidemiological studies addressing dyslipidemias. A study conducted with patients with chronic kidney disease undergoing hemodialysis treatment in a referral outpatient clinic in the state of Sergipe, Brazil found similar results.

Obesity, especially visceral obesity, is related to coronary risk in the development of left ventricular hypertrophy. A prevalence of individuals with normal weight (41.3%) was found in this study, while the average BMI was within desirable limits, in agreement with the results reported by a study addressing patients with chronic kidney disease, showing that inadequate weight in this population can be seen as a risk factor for cardiovascular mortality.

The presence of central obesity defined by waist circumference, when waist circumference greater than 88cm for women and greater than 102cm for men is an increased risk factor for CVR, presented a prevalence of 67.6% among females and 35.4% among men in a study conducted in the city of Brusque, Santa Catarina, Brazil. Such a prevalence was not found in this study’s population, who presented percentages lower than those reported by the aforementioned study, while central obesity was more prevalent among females than among males.

Statistically significant differences were found in relation to smoking when genders were compared, in agreement with studies conducted in Viçosa and Rio de Janeiro, Brazil that reported a prevalence of 48.3% and 48.34% respectively among males, which is one of the most important factors for acute myocardial infarction, especially among men. According to one study, smoking cessation reduces the chance of cardiovascular disease by up to 50%, though the degree of existing lesions in individuals who quit smoking is unknown.

Diabetes Mellitus is the most frequent cause of chronic kidney disease worldwide and is already the second most common etiology among patients un-
derning hemodialysis in Brazil. The prevalence of diabetes in this study is in accordance with a study conducted in Ribeirão Preto, SP, Brazil, where it is more predominant among males.\(^{(13-24)}\)

Physical inactivity was prevalent among males (41.32%), which is in agreement with a study conducted in 2000 Brazilian cities, showing that men are more sedentary than women, a fact that can be explained by the greater level of physical activity among homemakers.\(^{(25)}\)

More than half of our sample (88.7%) presented two or more cardiovascular risk factors, corroborating another study conducted in Brazil that presented the coexistence of hypertension with four or more risk factors among seniors, which can be explained by the age above 60 years old, because these individuals tend to present a greater association of risk factors.\(^{(26)}\)

Patients with chronic kidney disease are considered to be at a high risk for cardiovascular disease, which accounts for 40-50% of death among this population. A prevalence of low cardiovascular risk was presented by the studied patients, which conflicts with results reported in the literature.\(^{(27-29)}\)

Aware that cardiac mortality is much higher among individuals with chronic kidney disease than among hypertensive individuals, we would expect that this behavior would be reflected in higher rates of risk among patients with chronic kidney disease. Such a fact was not observed, despite the greater prevalence of hypertension, smoking and diabetes among the patients, suggesting that other factors not addressed by Framingham Risk Score play a more important role in determining risk in patients with chronic kidney disease when compared to the general population.\(^{(29)}\)

Such a result may be explained by the fact that the traditional Framingham Risk Score was used in our study instead of the modified Framingham Risk Score, which includes new cardiovascular risk factors based on the evidence of changes in the population’s epidemiological profile, such as obesity epidemic and metabolic syndrome, which accelerate atherosclerotic disease such as: left ventricular hypertrophy, microalbuminuria (30 to 300 mg/24h) and plasma creatinine levels greater than 1.5 mg/dl or creatinine clearance less than 60 ml/min.

Nurses and other health professionals cannot act based on intuition and should use the Framingham Risk Score to systematize care, preventing cardiovascular morbidity and mortality, though further studies are needed to improve stratification is special groups like those with chronic kidney disease.\(^{(30)}\)

**Conclusion**

The profile of patients with chronic kidney disease is: men of an economically active age, Caucasian, married, with low education and socio-economic status.

The socio-demographic variables age, ethnicity, marital status, and years of schooling were similar in terms of gender and cardiovascular risk while the variables family income and gender presented statistically significant differences in relation to cardiovascular risk.

The predominant cardiovascular risk factors were: hypertension, smoking, and sedentariness. The patients presented low cardiovascular risk assessed through the Framingham Risk Score. The results indicated low risk for future events, with the exception of those with multiple cardiovascular risk factors.

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**Collaboration**

Cesarino CB and Borges PP worked on the project’s conception, analysis and interpretation of data and redaction. Ribeiro RCHM contributed with relevant critiques of intellectual content and the version’s final approval. Ribeiro DF collaborated with data collection, analysis and interpretation of data. Kusumota L participated in the approval of the final version to be published.

**Referências**


