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Editorial

Knowledge Required to use the Power of Spirituality in Healthcare

For people dealing with changes in their health status, nursing care often involves attention to the physical aspects of their condition. In addition, people need to long discuss with health professionals how their lives have changed as a result of circumstances. Such discussions are based on the assumption that everyone needs hope, meaning, and purpose in their lives, and connection to their spiritual dimension (the essence of the self) can be a powerful part of the healing process. Observation of people has indicated that without such support, spiritual suffering can be added to the existing distress. Increasing evidence has shown that spirituality, whether expressed through religious or secular means, is an important component of patients’ quality of life, affecting their healthcare decisions and outcomes. These discussions invite nurses and other healthcare professionals into the spiritual dimension of the human person and the area known as spirituality. Broadly defined, spirituality gives meaning and purpose to life. A useful and more specific definition is: “Spirituality is the aspect of humanity that refers to the way individuals seek and express meaning and purpose and the way they experience their connectedness to the moment, to self, to others, to nature, and to the significant or sacred.”(1) Recently, a Canadian author suggested that “we would be wise to recognize the power that spirituality does bring for both nurses and those under their care.”(2) In order to better understand this power and use it effectively in nursing practice, further nursing knowledge is required at the individual, disciplinary, and interdisciplinary levels. The purpose of this editorial is to shed light on the types of knowledge needed to become skillful in addressing the spiritual aspect of humanity in the context of nursing care and stimulate further development of knowledge at all levels.

At the individual level, whether one is in a nursing education program, practicing clinical nursing, or conducting research on this topic, some types of knowledge need to be developed to be able to effectively participate in spiritual discussions with patients or research colleagues. Development of self-knowledge is critical to become aware of the spiritual dimension and to feel comfortable when entering into a spiritual discussion. Reflection on one’s spiritual health, wellbeing, and the factors contributing to it often are good topics to begin reflection activities. Doing a spiritual self-assessment might be another useful activity to determine strong areas and the areas in which to grow in order to enhance one’s own spiritual wellbeing. The use of a broad spiritual self-assessment tool such as that of Crouch(3) would be useful when undertaking such activity. Exploring concepts such as human person, health, and spirituality could ground one’s exploration of the place of spirituality in health and health care. Becoming familiar with various...
spiritual screening/assessment models and approaches as well as trying to discover how these models or portions of these models could be incorporated into the existing nursing assessment frameworks could be the next step. Finally, one must become knowledgeable about and comfortable with the interprofessional nature of spiritual care. Many healthcare professionals may have the opportunity or obligation to enter into spiritual discussions; obviously, some will do so in more depth than others. Likewise, all healthcare professionals should develop some comfort with intervention in the spiritual dimension as well as comfort and expertise in referring to and working with other professional colleagues in addressing spiritual needs. Increasingly, many healthcare professions include spiritual care at some level in their standards of practice and other professional guidelines.

At the disciplinary and interdiscipli nary levels, many research questions remain to be answered in the development of new knowledge regarding spirituality in health care. Examples of such questions include:

How do we effectively incorporate spiritual screening/assessment into our existing nursing assessment frameworks?

How do we most effectively prepare nurses and other health professionals to assess and intervene in the spiritual dimension?

How do we create interprofessional healthcare teams that work well together in the area of spiritual assessment and intervention?

Are patients’ spiritual needs being addressed in our current healthcare systems?

What is the power of attending to spirituality in both nurses and people for whom they care?

Nursing scholars have pondered and written about spirituality for over twenty-five years. Even while these discussions continue as a scholarly discourse, using our knowledge in our current practice and continuing to generate new research questions from that practice is important. These and other questions will guide the development in the next stages of nursing and interdisciplinary knowledge in the area of spirituality.

Joanne K. Olson, PhD, RN, FAAN
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Abstract

Objectives: To know the opinion of nurses report on the realization of nursing report at hospital discharge.

Methods: A sociological study - exploratory and cross-sectional incidental in a convenience sample of 400 nurses in the hospitals of the Region of Murcia (Spain), by applying a questionnaire.

Results: Significant associations between the variable unit of work and writing of the paper (p = 0.000) and continuing education about it (p = 0.027) was obtained. The same applies to the health center variable (p = 0.001) and higher academic education (p = 0.049).

Conclusions: The nurses say they are not prepared either theoretically or methodologically, to tackle the writing of the Nursing report at hospital discharge.

Keywords
Nursing process; Nursing administration research; Medical records; Continuity of patient care

Descritores
Processos de enfermagem; Pesquisa em administração de enfermagem; Registros médicos; Continuidade da assistência ao paciente

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Introduction

All steps of the Nursing Process (Assessment, Nursing Diagnosis, Planning, Implementation and Evaluation) should be integrated into the patient record system allowing communication between professionals of the healthcare team. The journal of nursing care to patients is an essential task both to provide adequate sanitary quality for the development of the profession.\(^{(1)}\)

Records of Nursing can be defined as “the supporting documentation where all information about nursing activity regarding a particular person in their valuation is collecting, treatment received and evolution.”\(^{(2)}\) In addition to serving as a documentary record, may used for the benefit of the health center and staff, as well as defending against a legal action and an evaluation system for the management of nursing care.

The registration of nursing practice in the clinical history of the patient involves a continuous update of the methodological and theoretical knowledge of the profession, and exchange of standardized information to all. Please ensure the planning and allocation of care through standardized taxonomies of NANDA, NIC and NOC diagnostics, and facilitate the application of nursing process in all its stages. Therefore, it can be an effective way to influence nursing practice, however, remains deficient and scarce.\(^{(3)}\)

Among the various records that manage nurses include the newest, known as nursing discharge report or, more recently, the Report of Continuing Care.

The Report of the High Nursing is the document developed and written by the nurse at discharge, who has attended the patient during hospitalization.\(^{(4)}\) Includes the fundamentals of nursing process for patient admission,\(^{(5)}\) ensures the continuity of care,\(^{(6,7)}\) facilitates the monitoring of patients\(^{(8)}\) and clarifies the role of the nurse in the population it serves.\(^{(9)}\) Another definition describes it as “the document closes the care process nurse initiated upon patient admission to a hospital, since communicating information about said patient between the two levels of support to our existing health care system.”\(^{(10)}\)

The significance of this report is determined from the General Health Law of 1986 established healthcare in Spain on two interconnected levels of care: primary care (as a gateway for users to the system) and Care (as support and complement the primary care still needed for those processes whose complexity requires).\(^{(11)}\) Since then, the continuity of care between the two levels has continued to be one of the main challenges that the various health services are being routinely face, with results so far quite discreet. Specific strategies proposed by experts we find nursing jobs report as a means of intercommunication, along with the creation of professionals as the liaison nurse, also called home nurse management, nurse or nurse case manager continuity, framed in case management programs.\(^{(11)}\) Is the figure responsible for ensuring continuity of care, both among the various segments (medical, social services, other nurses, ...) and levels of support, therefore we can say that makes agent when the patient requires social and health services.\(^{(12)}\)

These circumstances influence directly the fact that nursing in Spain is a European leader since the 70s of last century, which encourages managers to investigate the contents nurses, applications and training with professional on document in order to further develop the discipline.

It is therefore necessary to analyze the initial confrontation of clinical nurses in hospitals of the Region of Murcia to the immediate implementation of the realization of the Nursing report at hospital discharge. The goals we set in this paper are initially know their professional opinion (editorial, appropriateness and patient safety) and focus on identifying what the barriers they will encounter health managers when the time comes are work with the document (training, workloads, lack of time and professional relationships with other health groups).

Methods

We present a descriptive study - incidental to exploratory and cross-sectional approach. Performing first phase of literature review and subsequent field study, in which an analysis of qualitative and quan-
tative variables using validated by nature hospitals under study adapted to the sample after analysis using pretest questionnaire was performed.

The study population constitutes nurses Specialized Care in the Region of Murcia, located in hospitals in nine areas of health CCAA Murcia (Table 1). The sample was randomly selected among the professionals of the 9 hospitals in the Region of Murcia, belonging to 9 health areas of the region selected for the study.

The final questionnaire was developed after a mandatory completion of a pilot, during the month of June 2010 with a sample of 100 pretest to nine hospitals in the region, and based on the contents methodology used in the SELENE platform\(^{(13)}\) based on the Patterns Gordon\(^{(14)}\). Methods and tools used in all hospitals in the region of Murcia for the completion of the medical record and nursing and care management. Once collected and analyzed, the final model questionnaire, adapted to the subject target population of our study was designed. The final version includes 46 numerical questions, Likert scale or nominal dichotomous response (yes / no), divided into blocks that include occupational, sociodemographic questions college / continuing education and 4 specific questions related to knowledge and use of language professional standard, object of study of this work.

The sample size calculation was performed with the program GRANMO, with a confidence level of 95%, giving a final sample of 400 questionnaires. 530 questionnaires were distributed along with a presentation of the study generally, during the months of November and December 2010 and January 2011, including nine hospitals in the relevant areas of health in the Region of Murcia. Along with a presentation of the study questionnaire was attached in general, ensuring at all times the confidentiality and anonymity of the data collected, and counting with the collaboration of professionals from the center, responsible for each of the units. Inclusion criteria: nurse active in the centers studied at the time of research and welfare functions. Exclusion criteria: nurses who were not active at the time of completing the questionnaire. Variables under study: demographic and socio independent variables, and application dependent variables measuring dimensions that allow us the scope of study objectives: the nurse in relation to the Report to the Upper view of Nursing and the potential difficulties implantation.

For the descriptive analysis, measures of central tendency and frequency percentage was used. The association of quantitative variables was performed using Student t, Chi square used for the measurement of qualitative variables. Univariate and multivariate analyzes were performed, adjusting the model for length of job.

Using the statistical software package SPSS (Statistical Package for Social Sciences) version 19.0 for Windows, and the creation of a database of our variables, was performed the statistical analysis thereof.

The development of this study met national and international standards of ethics in research involving human subjects.

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<th>Health areas/Murcia</th>
<th>Hospitals</th>
<th>Surveys</th>
<th>Surveys null (not answered correctly, or not returned)</th>
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<td>I: Murcia/Oeste</td>
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Results

In terms of “socio-demographic and socio data”, the age of nurses respondents between 25 and 61 years, with a mean age of 37.24 years. There is a predominance of females (76.8%) compared to men (23.2%).

The flagship service is the internal medicine unit with 30.3% (n = 121), followed by surgical units with 24.8% (n = 99), appearing last outpatients with 0, 5% (n = 2).

Regarding the variable workload 64.8% (n = 259) of the nurses considered not adequate nurse staffing in the service where they work.

The set of questions related to the professional opinion regarding the conduct of a Report of Nursing at Hospital reveals firstly that 71.8% (n = 287) of nurses surveyed expressed “agree” with preparing the Nursing report at hospital discharge and allows the continuity of patient care for 89.8% (n = 359) of the surveyed sample. Moreover, its performance would influence better patient monitoring by nurses, nurses for future interventions in 92% of cases. When the patient is discharged by your physician, 56.5% of professionals (n = 226), says writing it, stating, however, not to draw up a 74.8% (n = 299) of nurses surveyed when a patient is transferred to another department within the same hospital.

In relation to whether once drafted, if delivery or on paper, 42.3% (n = 169) of respondents state that they deliver the patient or his family and does not deliver 27.8% (n = 111). A 30% (n = 120) did not answer.

Regarding the demonstration of academic level in the document, for 60% (n = 240) of the professionals surveyed report the realization of Nursing report at hospital discharge serves to highlight the current academic level of nursing. And 89% (n = 356) considered as an indicator of patient safety with which avoid future complications and adverse effects.

Comparison of distributions made by Chi-Square test shows significant differences between variable, review the Nursing report, and the unit of work ($\chi^2 = 50.145; p = 0.012$), and also with the ratio nurse / patient ($\chi^2 = 17.142; p = 0.000$).

The block of questions focused on aspects that hinder the implementation of the Report of Nursing discharge in the Region of Murcia, first shows that 68.8% of respondents believed that professionals need specific training on the Nursing report.

Loads of work in hospital units hamper the completion of a high nurse to report 81% (n = 324), and 86% of the sample consider difficulty completing the document if you subtract time for the rest nursing activities in his shift.

The relationship between the nursing and other health professionals would be an inconvenience for the report, as manifested by the nurses. The professional relationship between the nurse and the doctor would not affect 69% (n = 276), or be impeded by the professional relationship with the nursing assistants, 92% of cases (n = 368) or with other health professionals (social workers and physiotherapists) in 82.8% (n = 331) of respondents.

Also found statistically significant differences by Chi-Square between the “training in the Report” and the work unit ($\chi^2 = 27.282; p = 0.027$), and between temporary difficulty completing the document and the unit work ($\chi^2 = 42.666; p = 0.000$). The establishment of the crossing of the variables age group and the difficulty of writing the report of the High Nursing shows that 82.8% of professionals recognized that would be hard to make the report, especially those with who ranged in age between 21 and 34 years (88.3%).

Discussion

The results of our study we have known professional opinion and bias on the applicability of this document monitoring and care feedback. Local studies in different areas of health including health systems in various Spanish (Spanish Valencian Health Service, Spanish Cantabrian Health Service, etc.). Similar results are also obtained. Over 90% of respondents always considers its development is necessary before a small percentage who denies and also usually coincides with seasoned professionals in their jobs. Similar figures are reflected when considering their usefulness and relevance, and also that 24% of pro-
professionals express agreement be in order, a finding consistent with the several difficulties reported in the literature (16,17) when directions of Infirmary decided to begin mandatory this document.

Another point to note is that in units where there is a disproportionate nurse / patient ratio, the professionals do not write the Nursing report. Being on the other hand the ICU, the service where they are experimenting with the content, format and document models (18).

It is important that patient safety indicators required to follow good practice among those who are “reasoned the existence of standards for nursing staffing” (19) and this is not being met, as revealed by our data.

Continuity of care in the Murcia region reaches its maximum level with the launch of the “Single Management”, starting January 2010. Consider patient care as a longitudinal process without compartments and an integrated healthcare provision is defined by the disappearance of the barriers hitherto existing between primary care and specialized care. (20) The pilot began in the areas of health Yecla Murcia towns first, and Lorca later, coming soon to other areas health of the Region of Murcia. That same year he succeeded in passing the Royal Decree 1093/2010, of September 3, wherein the minimum set of data from clinical reports in the NHS and in which dutifully develops the Care Report defined Nursing through its Annex VII. (21)

Since June 2012 the Spanish Health System assumes that the quality of care involves the appropriate use of resources and technologies, and to ensure sustainability, security, continuity of care, equity and social participation, managers have focused their strategy in Addressing the chronicity. (22) This measure is justified by the changing needs of health and social care that cause aging population, increasing becoming chronic health conditions and limitations in activity in today’s society.

The Region of Murcia is in the process of implementation of the document at the regional level to soon have it spread across the country, and each area of Health uses its own document model. For it is essential that the collective nurse initially made the report to all patients seen at hospital discharge, and not just focus on completing it in those patients in certain chronic medical conditions. This mistake can have negative consequences on the development of clinical management nurse. One of the first we met, is already the name by which we mean the document. Its nomenclature continues at this time without being widespread. Following the literature review, we met with various denominations of the paper, referring to him as Report of care at discharge, discharge report nursing assessment report discharge nursing registration nursing discharge the patient, report recommendations to nursing discharge report or Continuity of Care (ICC). Opt instead for CHF Nursing Report High may suppose ourselves to confusion if we seek to develop the profession.

The next element to improve and standardize its structure, research topics for subsequent research.

**Conclusion**

The nursing profession in the Region of Murcia manifested not be prepared either theoretically or methodologically to complete the Nursing report at hospital discharge recognizing that requires specific training to deal with the registration of care in the document. Furthermore, the identified variables that directly impede the realization of the report have been the health center, hospital unit where the daily work and university academic training nurses have developed.

**Collaborations**

Seva-Llor AM; Montesinos MJL; Ortega CB; Cecagno D and Pina Roche F contributed to the project conception, relevant critical revision of the intellectual content, research development and data interpretation, drafting and final approval of the version to be published.

**References**


Cross-cultural adaptation of an instrument to measure the family-centered care

Adaptação transcultural de instrumentos de medida do cuidado centrado na família

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Lucas Bassolli de Oliveira Alves²
Maria Magda Ferreira Gomes Balieiro¹
Myriam Aparecida Mandetta¹
Ann Tanner³
Linda Shields⁴

Abstract

Objective: To assess the cross-cultural adaptation to Brazilian Portuguese of two instruments for the measurement of family-centered care, one for parents and one for healthcare professionals.

Methods: Methodological study of cross-cultural adaptation following the phases of translation, back-translation, analysis by experts, pre-test, test-retest and psychometric analysis after the application of the instrument to 100 parents of hospitalized children and 100 professionals from pediatric units of a teaching hospital.

Results: The evaluation of experts in both instruments showed a Kappa of 0.85 and 0.93 respectively. At pretest, participants suggested no changes. Test-retest reliability was good for both stability indexes. Factor analysis explained 43.9% of the total variance in the parents instrument and 43.4% in the staff instrument. Cronbach’s alpha coefficient was 0.723 for the parents instrument and 0.781 for the staff instrument.

Conclusion: The instruments adapted to the Brazilian culture presented reliability, stability and good internal consistency, with potential to be used in the pediatric clinical practice.

Keywords
Family; Pediatric nursing; Nursing care; Nursing research; Validation studies

Descritores
Família; Enfermagem pediátrica; Cuidados de enfermagem; Pesquisa em enfermagem; Estudos de validação

Keywords
Family; Pediatric nursing; Nursing care; Nursing research; Validation studies

Descritores
Família; Enfermagem pediátrica; Cuidados de enfermagem; Pesquisa em enfermagem; Estudos de validação

Resumo

Objetivo: Realizar a adaptação transcultural para a língua portuguesa brasileira de dois instrumentos de medida do cuidado centrado na família, um para pais e outro para profissionais da equipe de saúde.

Métodos: Estudo metodológico de adaptação transcultural seguindo as etapas de tradução, retrotradução, análise de especialistas, pré-teste, teste-reteste e análise psicométrica após aplicação do instrumento com 100 pais de crianças hospitalizadas e 100 profissionais de unidades pediátricas de um hospital universitário.

Resultados: A avaliação por especialistas de ambos os instrumentos apresentaram Kappa de 0,85 e 0,93 respectivamente. No pré-teste, os participantes não sugeriram alterações. No teste-reteste houve bons índices de estabilidade em ambos. A análise fatorial explicou 43,9% da variância total no instrumento pais e 43,4% no instrumento equipe. O coeficiente Alpha de Cronbach foi 0,723 no instrumento pais e 0,781 no instrumento equipe.

Conclusão: Os instrumentos adaptados para a cultura brasileira apresentaram confiabilidade, estabilidade e boa consistência interna com potencial para ser utilizado na prática clínica pediátrica.

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

Family-centered care (FCC) has been promoted as an ideal model for the care of children and their parents in the hospital, and in different healthcare contexts. It is based on the premise that the family is central to, and a constant in the lives of infants, children, adolescents, adults and the elderly, since the family, however defined by them, is their primary source of strength and support.

Recent studies have questioned the effectiveness and effects of the implementation of this model of care, and reinforce the importance of producing evidence to support its application in practice. In this sense, it is necessary to use reliable instruments which have been tested and which can measure how health professionals caring for patients and families realize the application of this model in health units. This will allow to identify barriers and to propose strategies for the implementation of FCC in various pediatric contexts.

A set of questionnaires in English, the Shields & Tanner Questionnaires, was developed to measure and compare the perspectives of parents and health professionals on FCC in different pediatric contexts. The instruments are structured and self-administered for both parents and health professionals and the questions are matched so that direct comparisons can be made between responses from the two groups. In each questionnaire, the first part includes sociodemographic questions and the second part presents 20 questions grouped into three domains: respect, collaboration and support. The respect domain includes items about recognizing the rights of the family in the hospital. The second domain, collaboration, reflects the recognition of the parental role in the partnership for the child’s care. The third domain, support, consists of items related to how healthcare professionals support the family. The measurement uses Likert scales with four alternatives to each question: never, sometimes, often and always.

The questionnaires were named Perceptions of Family-Centered Care-Parent (PFCC-P) and Perceptions of Family-Centered Care-Staff (PFCC-S).

These tools are useful to test the perceptions of health professionals, who are engaged in assisting patients and families, across several disciplines; for professors, researchers and managers to guide a practice based on the foundations proposed by the FCC, and to assess barriers to its implementation, and measure the effect of interventions to promote its use.

The objective of this study was to develop the cross-cultural adaptation of measurement instruments of the perception of parents and health professionals on FCC to the Brazilian Portuguese language.

Methods

This was a methodological study, in which the authors adopted steps internationally recommended for cross-cultural adaptation of measurement instruments, considering the rigorous process of testing and re-testing it requires, including (1) translation of the original English version of the instrument to Brazilian Portuguese by two bilingual translators; (2) back-translation of the instrument content to the original language; (3) review by the expert panel who analyzed the proposed version as for equivalences: semantic, idiomatic, cultural, conceptual, and items; (4) consensus and level of agreement among the experts in the comparisons of the versions of translation, back-translation and the original instrument; (5) pre-test applied to a group of individuals from the target population to assess comprehension of the instrument items; (6) test-retest applied to a group of individuals from the target population, in the interval of one week, to obtain agreement on stability; and (7) evaluation of the psychometric properties through reliability and validity tests.

Phases of pre-test, reliability and validity were conducted in a teaching hospital in the southern region of São Paulo, Brazil.

For equivalences of items, conceptual, cultural, idiomatic and semantic, an expert panel was formed with seven individuals, including two researchers.
on the theme of family, three healthcare specialists in pediatrics, one of the translators who participated in the back-translation phase and a family representative of hospitalized children.

The sample for pre-test and test-retest reliability of the instruments consisted of 20 subjects - ten parents of children who were hospitalized in two pediatric wards, one surgical and another medical, and ten health professionals working in these wards.

The final sample for the clinical application phase consisted of 200 subjects, in accordance with the recommendations for validation studies, which suggest at least five subjects multiplied by the number of variables in the instrument; namely 100 healthcare professionals and 100 parents of children who were hospitalized in Surgical Pediatric, Medical Pediatric, Emergency Pediatric, Pediatric Intensive Care and Neonatal units and health professionals working in these wards (Figure 1).

During the data collection, in the phase of content validity with the expert panel, the Delphi technique was applied to obtain a minimum level of agreement of 80% for each item. The Content Validity Index (CVI) was used for each item to analyze the collected data in this phase, considering a minimum value between 80% and 85% to determine the reliability of the instrument as satisfactory.

The Kappa coefficient and the intraclass correlation coefficient were used to assess the degree of agreement among the experts and to verify the stability and reproducibility of the instruments in the test and re-test phases.

For construct validity an exploratory factor analysis and main components analysis with orthogonal rotation, by the Varimax method, were applied with the aim of maximizing the sum of the variances of the loads in the factorial matrix. Values above 0.4 were considered acceptable as

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**Figure 1. Phases of the cross-cultural adaptation**
Cross-cultural adaptation of an instrument to measure the family-centered care

factor loading for maintenance of the item in the final instrument.

Exploratory factor analysis was used in this study because the instrument items were not previously grouped in the pilot study for the construction of the original instruments. This analysis allows the researcher to identify which items best define the construct, when adapted to Brazilian Portuguese.

The Kaiser-Meyer-Olkin (KMO) measurement was used to verify the sampling adequacy for factor analysis, with a value higher than 0.7 classified as good and above 0.85 as excellent.\(^{(16)}\) Internal consistency analysis by Cronbach’s alpha coefficient (\(\alpha\)) was used to calculate instrument reliability.\(^{(12)}\) The level of significance for the tests was set at 5% (\(\alpha = 0.05\)) and the statistical package used was SPSS for Windows, version 19.0 (SPSS Inc., Chicago, Illinois).

The development of this study complied with national and international ethical guidelines for research involving human subjects.

Results

The phases of cross-cultural adaptation of the instruments Perceptions of Family-Centered Care-Parent (PFCC-P) and Perceptions of Family-Centered Care-Staff (PFCC-S) were performed successfully. In the translation phase, the researchers evaluated the versions of the two translators and a synthesized version (Version I) was produced, which was approved by the translators. In the back-translation phase of Version I of the instruments no changes were required.

When evaluated by the expert panel, Version I of both instruments was modified in relation to the words and expressions that best represent comprehension in the Brazilian culture, resulting, after four rounds, in Version II, which presented CVI between 86% and 100%, and \(Kappa\) values of 0.85 in the parents questionnaire and 0.93 in the staff questionnaire.

In the pretest, both parents and staff evaluated the language as clear and easy to understand, without suggestions for changes, with an average time of completion of seven minutes.

In the test-retest, for all items, the value of the intraclass correlation coefficient was \(\geq 0.706\) in PFCC-P Version II and \(\geq 0.756\) in PFCC-S Version II. Overall, good stability indexes were found for both instruments.

The evaluation of the psychometric properties of the PFCC-P Version II was conducted with 100 parents of children hospitalized in pediatric units. The sample was 81% female; 37% were aged between 31 and 45 years and 22% between 26 and 30 years. In relation to their educational level, 31% had completed high school, whereas 28% had not completed high school. Parents spent an average of 1 to 2 hours (53%) to go from their homes to the hospital, with a reasonable degree of difficulty or somewhat difficult (36% and 23%) respectively. Regarding the number of children, 80% had one to two children and 79% of the sample reported having someone else helping them at home with the care of children.

Regarding the variables related to the children, 55% had been hospitalized before. Among the reasons for hospitalization, 19% were there for respiratory diseases, 16% had heart diseases and 13% could not explain the reason for admission. The mean length of hospital stay was one week, but 87% of respondents were unaware of the possible date of hospital discharge for their child.

In implementing PFCC-S instrument Version II, most participants were female (84%), aged between 26 and 30 years (43%); 42% were physicians; 29% nurses, 25% were physical therapists and 4% had other professions, such as social assistant and nutritionist. As to educational level, 53% reported having graduated from university, 23% had graduate qualifications in pediatrics and 17% in both pediatrics and neonatology. The majority (56%) reported working in pediatrics for three years or more.

The Kaiser-Meyer-Olkin (KMO) score for the PFCC-P instrument Version II was 0.709 and for the instrument PFCC-S, Version II, it was 0.716. The factor analysis using main components with
Orthogonal rotation (Varimax) showed that three previously fixed factors were able to explain 43.9% of the total variance in PFCC-P, Version II and 43.4% in PFCC-S, Version II. The dispersion of the factor loadings of each item in the PFCC-P, Version II and in the PFCC-S, Version II, according to three factors and the association with the domains respect, collaboration and support in the original instrument showed that there were at least three items for each factor, and each factor was related to more than one domain of the original instrument (Figures 2 and 3).

In PFCC-P, Version II, there were three items with acceptable factor loading for more than one factor “My child’s privacy and confidentiality are respected”; “I feel prepared for discharge/referral to other community services after my child’s discharge”; and “The staff understands what my family and I are going through” (Figure 2).

In PFCC-S, Version II, there were two items with high factor loading for more than one factor “Parents are prepared to discharge/referral to other services in the community to follow children up after discharge” and “Parents are informed about the name of the physician responsible for the care of their child” (Figure 3). One item presented low factor loading for three factors “Parents are overwhelmed with information they receive about their child.”

Cronbach’s alpha coefficient was 0.723 in the parents instrument and 0.781 in the staff instrument.

**Discussion**

The instruments Perceptions of Family-Centered Care-Parent Brazilian Version and Perceptions of Family-Centered Care-Staff Brazilian Version submitted to cross-cultural adaptation obtained satisfactory internal consistency indices, and a factor loading of at least three items for each factor. However, there were items with low factor loading and others were strongly associated with more than one factor, which can indicate a problem in the construction of the item, in the dimension design or in the comprehension of the item within the approach of the Family-Centered Care.\(^{(16)}\)

Both instruments presented good potential to be used in the pediatric practice, contributing to the identification of barriers in the implementation of the model of family- and patient-centered care, so as to guide the proposal of interventions to minimize them.

There was similarity in the responses of parents and professionals in the questions regarding family- and patient-centered care when compared with those found in the application of the original instrument,\(^{(10,16)}\) in the dimensions respect, collaboration and support.
The reliability of the instruments adapted to Brazilian Portuguese was similar to that of the pilot study,\(^{10}\) whose values of Cronbach’s alpha ranged between 0.72 and 0.79, in comparison to Cronbach’s alpha values ranging between 0.72 and 0.78 in the Brazilian version.

Three factors were capable of explaining 43.9% of the total variance in the parents instrument and 43.4% in the staff instrument. A similar result was found in the study of adaptation of the original instruments when applied in an adult intensive care environment,\(^{16}\) in which the total variance for the extraction of three factors was 46.6%.

In the literature, a solution explaining 60% of the total variance is considered satisfactory. For future research, psychometric evaluation of these tools in other populations with larger sample sizes, or a review of the number of factors is recommended. The authors suggest the use of a larger sample, considering 20 respondents per item as the ideal number.\(^{15}\)

After completing all phases, the adapted instruments received the following names: Perception of Family-Centered Care – Parents, Brazilian version (PFCC-P Brazilian version) and Perception of Family-Centered Care – Staff, Brazilian version (PFCC-S Brazilian version).

**Conclusion**

The instruments adapted to the Brazilian culture presented reliability, stability and good internal consistency, with potential to be used in the pediatric clinical practice.

**Collaborations**

Silva TON; Alves LBO; Balieiro MMFG; Mandetta MA; Tanner A and Shields L declare they have contributed to the project concept, analysis and interpretation of data, relevant critical review of its intellectual content, and approval of the version to be published.

**References**

Behaviors and comorbidities associated with microvascular complications in diabetes

Comportamentos e comorbidades associados às complicações microvasculares do diabetes

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Guilherme Oliveira de Arruda
Elen Ferraz Teston
Aliny Lima Santos
Sonia Silva Marcon

Abstract

Objective: To know the prevalence, behavioral factors and comorbidities associated with microvascular complications in diabetes mellitus.

Methods: Cross-sectional study with 318 people with type 2 diabetes mellitus, approached by telephone survey. A standardized questionnaire was used for data collection, the comorbidities were added and for the analysis, the Person chi-square test.

Results: More than half of participants (53.8%) reported that microvascular complications were present and the most frequent were ophthalmologic (42.8%), vascular (14.5%) and kidney (12.9%). Among the factors associated with complications, we highlight the inadequate number of meals (49.8%), no physical activity (50.6%), smoking (32.4%), addition of salt to ready to eat foods (86.4%) and hypertension (58.3%).

Conclusion: The prevalence of microvascular complications of diabetes mellitus was 53.8%, and behavioral factors as the number of meals per day, physical activity, smoking, addition of salt to ready to eat food and comorbidity, hypertension.

Keywords
Diabetes mellitus; Comorbidity; Diabetes complications; Behavior; Prevalence

Descritores
Diabetes mellitus; Comorbidade; Complicações do diabetes; Comportamento; Prevalência

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August 26, 2014

Resumo

Objetivo: Conhecer a prevalência, os fatores comportamentais e comorbidades associadas às complicações microvasculares decorrentes do diabetes mellitus.

Métodos: Estudo transversal realizado com 318 pessoas com diabetes mellitus tipo 2, abordados por inquérito telefônico. Na coleta de dados foi utilizado questionário padronizado tendo sido acrescentadas as comorbidades e para análise, o Qui-Quadrado de Pearson.

Resultados: Mais da metade dos participantes (53.8%) referiu apresentar complicações microvasculares e as mais frequentes foram as oftalmológicas (42,8%), vasculares (14,5%) e renais (12,9%). Dentre os fatores associados às complicações destacam-se o número inadequado de refeições (49,8%), não prática de atividade física (50,6%), uso de cigarro (32,4%), adição de sal na comida pronta (86,4%) e hipertensão (58,3%).

Conclusão: A prevalência de complicações microvasculares decorrentes do diabetes mellitus foi de 53,8%, tendo como fatores comportamentais o número de refeições por dia, prática de atividade física, uso de cigarro, adição de sal na comida pronta e comorbidade, a hipertensão arterial.

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Conflict of interest: there are no conflict of interest to be declared.
Introduction

Diabetes mellitus is one of the most common chronic noncommunicable disease worldwide, and its prevalence continues to grow due to population aging, economic development and urbanization that led to important changes in the lifestyle, marked by the presence of sedentarism and obesity.\(^1\) This is one of the most important chronic diseases and impactful to the public health system due to the high degree of morbidity and mortality and high costs for metabolic control and treatment of their microvascular complications.\(^2\)

It is estimated that the total number of people with diabetes in the world will rise from 285 million in 2010 to 439 million in 2030, indicating an increase of the disease, especially in developing countries.\(^3\) In Brazil, in this period, this population will increase from 4.5 million, in 2000, to 11.3 million, in 2013, estimating to reach 19.2 million in 2035, becoming the eighth country in the world in number of people with diabetes mellitus.\(^3\)

After 15-20 years of living with the disease, despite treatment to prevent the short-term effects, in long term, it can cause many acute and chronic pathological processes, such as dysfunction and kidney failure, eyes, nerves, heart and blood vessels, and it is also one of the major risk factors for cardiovascular disease.\(^4\) The most common microvascular complications are: neuropathy, retinopathy, nephropathy and ischemia,\(^2,5\) which are of microvascular origin and are associated with conditioning factors, which comes from the individual lifestyle, as inadequate eating habits, insufficient physical activity, consumption of alcohol and tobacco, and comorbidities.\(^2,6\)

Considering the importance of the individuals’ behavior in the development of type 2 diabetes mellitus, specific interventions in lifestyle can reduce the incidence of the disease and, when already diagnosed, may prevent microvascular complications. With collective actions among health care professionals, individuals and families, it is possible to develop strategies to identify early risk factors, avoid them and/or control them.\(^7\)

Accordingly, identifying the prevalence of microvascular complications caused by diabetes mellitus and associated risk factors as well as the groups most at risk for developing them, can subsidize the planning and implementation of health interventions targeting this population.

This study aimed to determine the prevalence, behavioral factors and comorbidities associated with microvascular complications caused by diabetes mellitus.

Methods

Cross-sectional study conducted among people with diabetes mellitus registered in the Diabetic Association of Maringá, State of Paraná, southern Brazil. This is a nonprofit organization that aims to provide the most affordable diet products and equipment for the control of diabetes mellitus. They perform measurement of blood pressure, cholesterol and glucose levels, and quite frequently, they also provide lectures on various topics, delivered by volunteer health professionals.

At that time, 3,730 people were registered in the association, with ages ranging from one to 89 years old; Among these, 1,168 were 18 years or older and diagnosed with diabetes mellitus type 2. In order to calculate the sample size, we adopted a prevalence of 50% for complications, the estimate with a confidence interval of 95%, a maximum error of 5% and 10% increase for losses, resulting in a sample of 318 individuals.

The subjects were selected by simple random sampling from the list of active residential telephone numbers, provided by the association, with the names in alphabetical order. Up to three attempts to contact the person were performed at different days and times. When it was not possible to make contact with the selected person, the drawn person was replaced by the next in the list, allowing up to three substitutions before considering loss.

Data were collected through a telephone survey conducted between January and September 2012. In the survey, the adapted questionnaire from the Vigitel research - Monitoring of Risk and Protective factors for Chronic Non Communicable Diseases by Telephone Survey was used,\(^8\) supplemented with issues relating
to sociodemographic characteristics and comorbidities (hypertension and hypercholesterolemia).

The interviews, conducted by health professionals previously trained, had an average duration of 20 minutes and included the presentation of the researcher, the study objectives, methodology (approach by phone) and verbal consent. Responses were recorded on a hard copy of the instrument of data collection. Interviewers clarified the doubts of the participants regarding the research when necessary and, every time they were requested, they would also clarify aspects related to the control of diabetes mellitus after the interview.

Behavioral variables and comorbidities were addressed: food consumption (adequate and inadequate), regular physical activity (yes/no), alcohol consumption (yes/no), presence/absence of comorbidities (hypertension and hypercholesterolemia). Dietary patterns were classified as adequate when patients reported eating fruits and vegetables five or more times a week; always removed the skin and visible fat from meat; consumed less than one serving of sweets, cake, cookie or soda per day; did not consume whole milk; and did not add salt to ready to eat food. The number of meals was considered adequate when they had five or more meals per day.

The collected data were categorized and entered on Microsoft Office Excel 2010 software and analyzed using the Statistical Package for the Social Sciences®. We used nonparametric Pearson chi-square test to identify significant differences in the proportions of the microvascular complications of diabetes mellitus, according to behavioral variables and comorbidities. The measure of association used was the odds ratio with 95% confidence interval of significance level set at p<0.05.

The development of the study met national and international standards of ethics in research involving human beings.

## Results

A total of 318 people with diabetes mellitus were interviewed, and more than half were female (54.1%) aged between 22 and 89 years old, with a mean of 63.1 years and a higher prevalence in the age group between 60 and 79 years (57.9%). Most participants reported having a partner (73.6%) and more than half had completed elementary school (52.8%). Regarding health behavior, 75.2% reported no physical activity, 70.8% did not make the appropriate number of meals daily, alcohol consumption corresponded to 23.6%, 11.9% had an inadequate dietary pattern, 10.7% made use of tobacco and 6.9% added salt to ready to eat food.

With regard to the prevalence of comorbid conditions studied, it was found that 66.4% and 37.7% reported, respectively, presence of hypertension and hypercholesterolemia. Microvascular complications were reported by 171 subjects (53.8%) and the most frequent one were ophthalmic (42.8%), followed by vascular (14.5%) and kidney (12.9%). It was found that the appropriate number of daily meals, the addition of salt to ready to eat food, physical activity, not smoking and self-reported hypertension were associated with microvascular complications in general, as table 1.

<table>
<thead>
<tr>
<th>Behavioral variables and health condition</th>
<th>Complications of diabetes mellitus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n(%)</td>
</tr>
<tr>
<td>Number of meals per day</td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td>59(36.4)</td>
</tr>
<tr>
<td>Inadequate</td>
<td>112(49.8)</td>
</tr>
<tr>
<td>Dietary pattern</td>
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<tr>
<td>Adequate</td>
<td>155(55.4)</td>
</tr>
<tr>
<td>Inadequate</td>
<td>16(42.1)</td>
</tr>
<tr>
<td>Salt addition</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19(86.4)</td>
</tr>
<tr>
<td>No</td>
<td>152(51.4)</td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>50(63.3)</td>
</tr>
<tr>
<td>No</td>
<td>121(50.6)</td>
</tr>
<tr>
<td>Alcohol consumption</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>37(49.3)</td>
</tr>
<tr>
<td>No</td>
<td>131(55.0)</td>
</tr>
<tr>
<td>Smoking habits</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11(32.4)</td>
</tr>
<tr>
<td>No</td>
<td>160(56.3)</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>123(58.3)</td>
</tr>
<tr>
<td>No</td>
<td>48(44.9)</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>73(60.8)</td>
</tr>
<tr>
<td>No</td>
<td>98(49.7)</td>
</tr>
</tbody>
</table>

OR – Odds Ratio; 95%CI– 95% Confidence Interval
Behaviors and comorbidities associated with microvascular complications in diabetes

Behavioral variables and health conditions which presented association with microvascular complications, in general, also presented statistical relationship with the ophthalmic complication, but were not associated with renal and neuropathic complication, as shown in table 2.

### Discussion

Limitations of this study relate to the use of the telephone survey as data collection strategy from individuals registered to an association, making it impossible to generalize the results to other settings, especially for being based on self-reported data. However, several studies indicate that the accuracy of self-reported morbidity information varies according to the type of disease, its severity, the presence of comorbidities and socioeconomic characteristics. A study conducted in southeast Spain showed, for example, that self-reported diagnosis of diabetes had higher validity when compared to the report of hypertension and dyslipidaemia. The use of telephone survey is an efficient strategy of communication with users, as it potentializes ease, low cost and speed. In Brazil, this feature has been used successfully in populations in which the telephone services reach the majority of residences.

Regarding the profile of respondents, the highest prevalence of women in line with the result of a study conducted in Canada, which showed higher prevalence of diabetes for women immigrants from Latin America and the Caribbean, which was also identified in a study with Spanish population. In this sense, a review study on the epidemiology, management and cost of complications associated with type 2 diabetes in Brazil, found increased demand for health services and assistance from women, due to greater concern with health issues they have. Furthermore, prevalence can be explained by the way the sample was planned, as the calls to apply for participation in the study were performed for residences in business hours.

The highest prevalence of people in the age group of 60-79 years may be due to the fact these people are the ones that stay at home, but may

### Table 2. Univariate analysis of microvascular complications according to behavioral variables and health condition

<table>
<thead>
<tr>
<th>Behavioral variables and health conditions</th>
<th>Ophthalmic complications (n=136)</th>
<th>Renal complications (n=41)</th>
<th>Neuropathic complications (n=46)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n(%) p-value OR (95%CI) n(%) p-value OR (95%CI) n(%) p-value OR (95%CI)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of meals per day</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td>51(54.8) 0.005 0.50(0.30-0.81)</td>
<td>13(14.0) 0.710 0.67 (0.43-0.77)</td>
<td>14(15.1) 0.848 0.93(0.47-1.84)</td>
</tr>
<tr>
<td>Inadequate</td>
<td>85(37.8)</td>
<td>28(12.4)</td>
<td>32(14.2)</td>
</tr>
<tr>
<td>Dietary pattern</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adequate</td>
<td>125(44.6) 0.066 0.50(0.24-1.05)</td>
<td>37(13.2) 0.643 0.77 (0.26-2.30)</td>
<td>40(14.3) 1.12(0.44-2.86)</td>
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<td>Inadequate</td>
<td>112(28.9)</td>
<td>4(10.5)</td>
<td>6(15.8)</td>
</tr>
<tr>
<td>Salt addition</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>15(68.2) 0.013 3.09(1.22-7.82)</td>
<td>3(12.9) 0.914 1.07 (0.30-3.79)</td>
<td>5(22.7) 0.254 1.82(0.64-5.22)</td>
</tr>
<tr>
<td>No</td>
<td>121(40.9)</td>
<td>38(12.8)</td>
<td>41(13.9)</td>
</tr>
<tr>
<td>Physical activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>44(55.7) 0.007 0.49(0.29-0.83)</td>
<td>7(8.9) 0.217 1.70 (0.72-4.01)</td>
<td>8(10.1) 1.67(0.74-3.76)</td>
</tr>
<tr>
<td>No</td>
<td>92(38.5)</td>
<td>34(14.2)</td>
<td>38(15.9)</td>
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<tr>
<td>Alcohol consumption</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28(37.3) 0.272 0.74(0.43-1.26)</td>
<td>8(10.7) 0.530 0.77 (0.33-1.75)</td>
<td>10(12.0) 0.76(0.35-1.67)</td>
</tr>
<tr>
<td>No</td>
<td>106(44.5)</td>
<td>32(13.4)</td>
<td>36(15.1)</td>
</tr>
<tr>
<td>Smoking habits</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>7(20.6) 0.006 0.31(0.13-0.73)</td>
<td>3(8.8) 0.454 0.62 (0.18-2.15)</td>
<td>5(14.7) 0.966 1.02(0.37-2.79)</td>
</tr>
<tr>
<td>No</td>
<td>129(45.4)</td>
<td>38(13.4)</td>
<td>41(14.4)</td>
</tr>
<tr>
<td>Hypertension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>101(47.9) 0.010 1.88(1.16-3.07)</td>
<td>32(15.2) 0.089 1.94 (0.89-4.24)</td>
<td>31(14.7) 0.872 1.05(0.54-2.05)</td>
</tr>
<tr>
<td>No</td>
<td>35(22.7)</td>
<td>9(8.4)</td>
<td>15(14.0)</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>58(48.3) 0.127 1.42(0.90-2.25)</td>
<td>16(13.3) 0.869 1.05 (0.54-2.07)</td>
<td>20(16.7) 0.395 1.31(0.69-2.47)</td>
</tr>
<tr>
<td>No</td>
<td>78(39.8)</td>
<td>25(12.7)</td>
<td>26(13.2)</td>
</tr>
</tbody>
</table>

| OR – Odds Ratio; 95% CI– 95% Confidence Interval |

OR – Odds Ratio; 95% CI– 95% Confidence Interval
also be related to the increase in disease incidence with increasing age, which also was verified in other studies. The large proportion of people with a partner and the fact that more than half of them had completed elementary school constitute protective factors for the development of microvascular complications such as mortality from diabetes mellitus has been more frequent among widowers and singles, while the higher risk of developing complications of the disease has been found in people with low education, given the greater difficulty in the teaching and learning process and, consequently, lower adherence to treatment.

Nevertheless, it is essential to consider the behavior and habits of each individual, because, commonly, acute and chronic complications arising from diabetes mellitus are associated with lifestyle, that is, to the way the individual controls glucose levels. Indeed, among the main factors and habits that can help control the disease are proper nutrition and weight control, which may provide improvement in glycemic control, with consequent reduction of risk for cardiovascular disease and improvement in quality of life.

In the present study, it was found that individuals who experienced a complication of diabetes mellitus reported more frequently, adequate number of meals, although they added salt to ready to eat food, which explains, in part, hypertension being the most frequent comorbidity. Moreover, these individuals reported more concern about physical activity and not smoking. Proper handling of food is essential for the prevention of microvascular complications, it is important not only to have the appropriate number of meals, but also to observe the characteristics of the food consumed, since they can act either as protectors or promoters of complications.

Changes in lifestyle are also very important to control the disease, especially considering the consumption of foods with low glycemic levels, and rich in fiber such as whole grains, legumes, vegetables and fruits, favoring glucose and insulin metabolism. The appropriate number of daily meals and their quality contributes to weight control and glucose levels which can aid in the reduction of cardiovascular risk factors, prevent acute and chronic complications, and promote overall health to patient. It is noteworthy that people with diabetes mellitus are usually more careful in the choice of foods, avoiding those that contribute to weight gain, such as pizza, lasagna and pasta.

Additionally proper diet, exercise has been considered one of the three main factors for the control of diabetes mellitus, since its regular practice improves circulation, lowers blood glucose, enhances the action of insulin, collaborates in weight control, hypertension and lowering cholesterol and triglycerides.

Regarding physical activity, most people interviewed said they did not practice it as recommended. Another study also found that the frequency in people with diabetes mellitus who regularly engage in physical activity is low.

Although no statistically significant association was observed between alcohol consumption and microvascular complications of diabetes mellitus, diverging of the findings of a retrospective study that showed association between these variables, it is known that excessive alcohol consumption in the long term increases the incidence of complications of disease while the reduced consumption is considered a protective factor. The frequency of individuals who do not smoke and who had microvascular complications was significantly higher when compared to individuals who smoked. This finding differs from results found in another study in which smokers were nearly 11 times more likely to microvascular complications. Thus, it is believed that at least part of nonsmokers who had complications are actually former smokers.

However, we highlight the identification of deleterious behaviors associated only with ocular complications. While smoking causes harmful effects to the retina in this study, we showed an inverse association between smoking habits and ophthalmic complications, as the frequency of individuals with this type of complication was higher among nonsmokers. This allows inferring that these individuals were smokers and suspended the use of cigarettes,
after the emergence of complications, in order to prevent its aggravation.

Nevertheless, it is observed that there is no consensus in the literature regarding the association between cigarette smoking and ophthalmic complications, which may be related to the fact that smokers, because they have lower life expectancy, do not reach advanced ages when the risk of developing ophthalmic complications increases substantially.\(^{20}\)

Hypertension, although not an exclusively behavioral factor in nature, implies considerably in the emergence of microvascular complications among individuals with diabetes mellitus, particularly when coupled with long time of diagnosis and lack of glycemic control. The results of this study show that individuals with high blood pressure more frequently reported microvascular complications, especially in relation to ophthalmic complications. Hypertension is a major risk for developing ophthalmic complications in the form of hypertensive retinopathy, considerably increasing the occurrence of this condition among people with diabetes mellitus, especially when the disease is not adequately controlled.\(^{21}\)

Deficiency in the control of cholesterol levels can also predispose microvascular complications in individuals with diabetes mellitus, but there was no significant difference in the frequency of microvascular complications in those with and without hypercholesterolemia, even in the case of renal complications where the rate was almost double among those who reported hypercholesterolemia.

**Conclusion**

The prevalence of microvascular complications of diabetes mellitus was 53.8%, considering the following behavioral factors: number of meals per day, physical activity, smoking habits, addition of salt to ready to eat food and the comorbidity hypertension.

**Acknowledgements**

To the Association of Diabetics of Maringa for their availability to provide us with contact information of people with diabetes who were registered at the Association.

**Collaborations**

Cecilio HPM; Arruda GO; Teston EF and Santos AL contributed to the project design, application of the study, drafting of the paper and final approval of the version to be published. Marcon SS contributed to the project design, critical review of relevant content and final approval of the version to be published.

**References**


Factors involved in the delivery of nursing care
Fatores intervenientes na produção do cuidado em enfermagem
Danielle Fabiana Cucolo¹
Márcia Galan Perroca¹

Abstract
Objective: To identify the main factors involved in the delivery of nursing care, aiming at the development of items for an instrument.
Methods: This was a qualitative study conducted with four sessions of focus groups involving 20 clinical nurses. The guiding questions included perceptions and experiences of nurses on the quality (high or poor) of care delivered during their work shift. The statements were studied using thematic content analysis, based on the reference of the complex adaptive system.
Results: Four thematic categories emerged: (1) planning, intervention and evaluation of care; (2) design and qualification of the nursing staff; (3) resources to perform health care; and (4) multi-professional interaction. Those aspects involved in the production of care were characterized as systemic, multifactorial and related primarily to inadequate human resources, work conditions and organization.
Conclusions: The factors involved in the delivery of nursing care were identified for the development of items for an instrument, and show the potential to guide nurses and assist management decisions.

Resumo
Objetivo: Identificar os principais fatores intervenientes na produção do cuidado em Enfermagem para geração de itens de instrumento.
Métodos: Estudo qualitativo totalizando quatro sessões de grupos focais com a participação de 20 enfermeiros clínicos. As questões norteadoras incluíam percepções e experiências dos enfermeiros sobre a qualidade (ótimo ou ruim) de seu turno de trabalho. Os discursos foram examinados por meio da análise de conteúdo na modalidade temática, apoiando-se no referencial sobre sistema adaptativo complexo.
Resultados: Emergiram quatro categorias temáticas: (1) planejamento, intervenção e avaliação do cuidado; (2) dimensionamento e qualificação da equipe de enfermagem; (3) recursos necessários para prestar assistência; e (4) interação multiprofissional. Os aspectos intervenientes na produção do cuidado revelaram-se multifatoriais e sistêmicos e relacionados, principalmente, à insuficiência de pessoal e às inadequadas condição e organização do trabalho.
Conclusão: Os fatores intervenientes na produção do cuidado de Enfermagem para geração de itens de instrumento foram identificados e poderão nortear os enfermeiros em decisões assistenciais e gerenciais.

Keywords
Data collection/instrumentation; Focus groups; Nursing assessment; Nursing service, hospital; Nursing care

Descritores
Coleta de dados/instrumentação; Grupos focais; Avaliação em enfermagem; Serviço hospitalar de enfermagem; Cuidados de enfermagem

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Introduction

Nursing manages its practice in subsystems of production that interact interdependently as part of a complex whole. Variations in inputs, processes and organizational characteristics influence the generated product, namely, the delivery of care.(1)

In the systemic perspective, and according to complex thinking, care may be characterized as a dynamic, self-organized and nonlinear process. Such processes are also associated with the interaction between the knowledge and the participative/creative people behavior, in addition to unexpected demands and consequently constant adaptations.(2,3)

The delivery process is related to the efficiency of the healthcare organizations. Nursing workflow reflects the dimensions of a complex adaptive system displayed by frequent relocations, which hinders patient-focused interventions and leads to unexpected occurrences, interruption and (re)prioritization, in addition to the influence of the environment and needed resources.(4,5)

Policy and financial constraints of the health system and restrictions on the scope of practice, in addition to fragmentation and professional tensions, have undermined nurses’ ability to deliver and improve the care required. The provision of the right care at the right time, focused on the needs of the patients, requires a transformation of the work environment, as well as changes in the scope of nursing practice and education, and in the amount of nursing staff.(6,7)

In this context, it is necessary to conceive of tools for the management of delivery processes that can measure and lead this transformation in professional nursing organizations. Its application enables researchers to assess the efficiency and effectiveness of the performed activities in a systematic way, contributing to decision making and negotiations aimed at process improvements.

This study aimed to identify the main factors involved in the delivery of nursing care in order to develop instrument items.

Methods

We opted for a qualitative approach, utilizing focus groups, in order to reach the proposed goal. This method is a valuable tool to produce new content, and thus guide the generation of items, the initial step in the development of measurement scales.(8)

Three large hospitals in the state of São Paulo, Brazil, were included in the study, in order to add participants from different scenarios regarding professional healthcare practice and fields of study. Data were collected between the months of October of and July of 2012.

Initially, contact was made in person and/or via electronic media with nurse managers, leaders of nursing continuing education departments, and human resources department leaders, depending on each service for the research project presentation and attainment of permission to conduct the study.

After being contacted, nursing managers and continuing education leaders of the institutions indicated 39 clinical nurses from different units (criterion for inclusion). The nurses were approached personally by one of the researchers for clarification regarding the study’s purpose, time, and place of the meetings; finally an invitation letter was provided. Among these, 20 agreed to participate in the study. It was not possible to establish contact with a total of four nurses; due to lack of time, another 15 nurses declined. Telephone contacts and emails were used to remind participants of the previously scheduled meetings, and to encourage participation.

Four focus groups were conducted with three to seven nurses, following recommendations in the literature.(8,9) In one hospital, two focus groups were performed. In this study, the deepening of the theme during the discussion was favored by smaller groups. The meetings took place in the institutions, in rooms of easy access without outside interference. They covered afternoon shifts (n = 16) and night shifts (n = 4), according to participants’ availability, with a duration ranging from 90 minutes to two hours.
Factors involved in the delivery of nursing care

The discussions were led by one of the researchers (PhD in Nursing) with over ten years of professional experience in patient care and management of educational activities in nursing programs. The guiding questions, previously tested, were: “Which aspects do you evaluate at the end of the work shift to determine that your work performance was of high quality?” and “When you consider your work performance to be poor?” For personal and professional characteristics of the participating nurses, a questionnaire was administered preceding discussions.

As a first step, nurses were encouraged to write about the proposed issue, getting closer to the focus of study. Then a round of discussion began, with free expression, allowing interaction with other group members and encouraging their perceptions about the subject.

The discussions were recorded and filmed, with prior consent of the participants, and notes were recorded. A feedback session was held for the participants at the end of each focus group. Subsequently, the transcripts were reviewed by two researchers and compared with the audiovisual material obtained to verify its accuracy. The same researchers performed the coding of data, independently, which was continuously refined as the analysis provided new insights and consensus was reached. For this, thematic content analysis was used.

This technique was a systematic and objective procedure for description of record units with subsequent categorization, based on the following steps: (1) pre-analysis; (2) exploration of the material; and (3) treatment of the results, inference and interpretation. The systemic perspective and complex thinking were used as theoretical frameworks for the analysis of the nursing care delivery process and its management.

To ensure anonymity, participants were cited in the statements and discussions by the acronym S (subject) and listed chronologically, S1, S2, S3, S4, S5; focus groups were listed as M1, M2, M3 and M4, representing the meetings held in different health institutions.

The development of the study met national and international standards of ethics in research involving human beings.

Results

The 20 participating nurses were predominantly female (n = 15), with a mean age of 31 years (SD = 6.6, range 26-50 years) and a mean professional experience of 4.2 years (SD = 3.8, range 1-15 years). They worked in adult and pediatric inpatient units (n = 17), and adult and pediatric intensive care (n = 3). Regarding training, 14 were enrolled or had completed specialization courses in the work field related to the work area. In the content analysis of the statements, four thematic categories emerged and represented the main factors involved in the delivery of nursing care: (1) planning, intervention and evaluation of care; (2) design and qualification of the nursing staff; (3) resources to perform health care; and (4) multi-professional interaction.

Discussion

Despite the concern of the participation of nurses working in different care settings and with different work processes, our findings are restricted to the context of the three hospitals investigated, and may differ from other realities. The factors involved in the delivery of nursing care proved to be multiple and systemic, and reflect the need of redesign in the organizations. The impact of these factors on the labor process also became clear, in regard of the urgency for equipping nurses for management and policy decisions, as well as in negotiations for care excellence.

Time management is a key factor in how nursing work is organized and understood, influencing the planning, communication and decision making of nurses, consequently causing an impact on the delivery of patient care. An effort of cooperation and coordination between teams is required to ensure that work will be completed in a timely manner.
Given the various activities performed due to the demand for health care, time constraints and limited resources, the nurse is often distant from direct assistance and may omit important aspects of care.\(^{(12)}\)

The amount of missed care is related to the increased workload, and those activities are generally considered as being exclusively within the competence of nurses. This omission indicates a deficiency in the quality of care and represents a potential risk for adverse patient events.\(^{(13)}\)

The study emphasizes the importance of equalizing the workload among available professional staff, and the establishment of systems to detect care needs, to guide the health team regarding the care to be provided, and also about the allocation of patients in the units.\(^{(14)}\) The high turnover of patients (admissions, discharges and transfers) increases the risk of death, and therefore should be considered in the staffing of nursing personnel.\(^{(15)}\)

The educational process is another essential service for the qualification of nursing staff, in the sense that this adds knowledge and increases the feeling of emotional security of the professional, enabling him/her to perform his/her practice in a competent, independent and collaborative way, which consequently impacts the quality of care.\(^{(16)}\)

The organizational environment can strongly influence the ability of nurses to build and maintain a therapeutic relationship with patients. This contact provides clinical supervision and follow-up of the interventions made by the technical team and establishes a more direct relational care with patients.\(^{(17)}\)

Certain aspects of the nursing work environment affect how nurses assess the care provided in their unit. When closer involvement with direct patient care occurs, assessment becomes more assertive; and, when human capital and resources are adequate, there is a better perception about patient safety.\(^{(18)}\)

The complexity of interventions associated with intense specialization and the transformations that occur in healthcare work imposes a coordinated and integrated approach among various professionals to meet the dimensions of human care. The multidisciplinary team meetings stand out as a practice that improve collaboration in the therapeutic plan, from the perspective of comprehensiveness and interdisciplinary attitude.\(^{(19)}\)

Multidisciplinary discussions enable the exchange of information in an environment of support and encouragement of communication to promote the development of relational coordination, which improves the performance of interdependent work processes.\(^{(20)}\) Many interactions among different professionals are undocumented and end up either lost or misunderstood, increasing the vulnerability to errors. The nursing coordination and patient care follow-up are therefore essential to ensure adequate management and efficient flow of information.\(^{(21)}\)

This action requires new forms of relationships, both in the institutional hierarchy and work organization, and also changes in the patient-provider relationship in order to provide a stronger bond, acceptance, and improved access. Furthermore, it contributes to more cooperative work, minimizing conflicts and improving worker satisfaction as well as the care provided.\(^{(22)}\)

Several aspects appear to restrict major advances in care management. One of the most significant factors constitutes the limitations of a structured delivery system that is strictly focused on patient centered care. This behavior implies the involvement of the patient in the establishment of his/her own needs and plans of care, the engagement of the team, and the structuring of services that promotes a favorable climate for this practice.\(^{(23)}\)

**Conclusion**

Those factors involved in the delivery of nursing care that can be used in the development of instrument items have been identified, and can guide nurses in clinical and managerial decisions.

**Acknowledgements**

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Factors involved in the delivery of nursing care

Collaborations
Cucolo DF and Perroca MG declare that they both contributed to the conception and design of the study, analysis and interpretation of data, in drafting the article, in critical revision of the important intellectual content, and that they gave the final approval of the version to be published.

References

How nursing students perceive communication with patients in mental health

Como o estudante de enfermagem percebe a comunicação com o paciente em saúde mental

Albert Lengruber de Azevedo¹
Silvia Teresa Carvalho de Araújo¹
Veronica Lopes Louzada Vidal¹

Abstract

Objective: To identify how Nursing students perceive patient communication in mental health and describe how this perception influences their own communication for care.

Method: Qualitative, with individual artistic production after relaxation using instrumental music and drawing in a planned cube. The analysis of the words and phrases pronounced in the group evidenced the thematic unit about the perceived communication through the bodily senses, shared by 23 seventh-semester students from the Nursing program.

Results: The production demonstrates that the communication perceived and expressed indicates intervention, approximation, expanded listening and attention. The bodily senses perceive behavior, language, disorders, defense mechanisms, approximation and needs for improvements in care.

Conclusion: The student’s bodily senses register and express the verbal and non-verbal communication of patients with mental disorders through feelings, behavior and body hygiene conditions, which give rise to care needs.

Keywords
Education, nursing; Students, nursing; Nursing care; Communication; Mental health

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Conflicts of interest: the primary author presented a study on the same theme at the 17th National Seminar of Nursing Research (Senpe), “Patient communication: Nursing students’ perception in hospital-based mental health care”, in June 2013, Natal, RN, Brazil.
Introduction

To situate the students’ perceptions about patient communication in the hospital context, important observations were considered on the pedagogical trajectory, in which they often dismissed interdictions of care for mental disorder patients in their care practice, without having been shared as significant experience.

This study is not an absolute novelty, but the central idea remains hardly explored in mental health nursing teaching, as it values the students’ sensory perceptions of the clients’ communication and behavior and arouses other aspects that remain hardly explored in teaching, as they avoid talking about not always pleasant tensions.

Conditions of depression associated with diabetes, hypertension, cardiovascular disease, drugs use, suicide and other risk behaviors have been frequently observed in relation to physical and mental disorders and, when combined, provoke greater disability and dependence on care.\(^1\)

In 2030, mental illnesses will be the most impacting disease all over the world,\(^2\) and currently affect younger generations, whose symptoms of mental disorders occur in less than half of the case before the patients turn 21 years of age. Other simultaneous and comparable studies in 15 countries showed that, in general, people consider greater social disability and the exercise of daily personal tasks more similar between clinical illnesses and mental illnesses.\(^1\)

Hence, the stigma, fear and doubt cannot make students experience learning with aversive feelings that make them take distance from the patient. Learning should outline a space that permits the appropriation of how we perceive and react, so as to be able to resize the distinguished look on the clientele, prioritizing more integrative teaching and care practices.

Since 1990, a new mental health concept has stood out in the global context, involving the family in the treatment and rehabilitation process.\(^3\) And nursing needed to adapt to the mental health programs with a view to a practice marked by knowledge, skill and attitude.

Emotional behavior is also an important transmitter of cultural patterns and that makes us reflect on how the students learn to practice nursing, as well as on how we professors learn to advise them.

The objectives in this article were set as: to identify how Nursing students perceive patient communication in mental health and to describe how this perception influences their own communication for care.

Methods

Qualitative, descriptive and exploratory research, aimed to gaining further knowledge to discover how students perceive communication through the bodily senses they share, as the study phenomenon could not be understood quantitatively.

Based on the contact with the teachers responsible for administering the content of the mental health subject and the scheduling in the activity timetable, two meetings were proposed with the nursing students who had enrolled for the subject. The first meeting took place before the start of the activity in the practice context and the second at the end of the school semester.

The study participants were 26 nursing students from the seventh course semester, three of whom were not considered as they were absent at the two moments described. The study was undertaken in a classroom of a public Higher Education institution located in the city of Rio de Janeiro (RJ), in the Southeast of Brazil, in April and May 2013.

To identify communication codes based on the students’ perception, the instruments called “Game of Luck” and “Experience of Socio-Communicative senses of the Body” were used.

The first meeting was linked to the presentation of the research and data production, and happened during a breakfast, called “affective breakfast”. The activity was held after relaxation to the sound of an instrumental song, followed by the signing of the Free and Informed Consent Form. This phase took 30 minutes.

The subsequent phase, with a mean duration of one hour, was preceded by the individual distribu-
tion of an A4 sheet of paper with a planned cube to make drawings based on the guiding questions: (1) “How do you perceive the communication of mental disorder patients?” and (2) “How does this perception influence your communication during interaction and care?”. In the play technique “Game of Luck”, each student was expected to conclude the activity by writing a word and/or phrase to explain the meaning of the drawing.

In the enunciation phase, each student shared his/her drawing and the word and/or phrase that summarized the production. Based on a collective discussion, which took an average 40 minutes, they expressed what they wanted to share with the entire group. This phase permitted the exchange of personal and academic histories, doubts, individual and/or collective needs related to communication, interaction and care for patients with mental disorders.

The reclusion phase permitted the transcription of the testimonies recorded during the first meeting, floating reading, exhaustive rereading, and the triangulation of these statements with the words and/or phases written in the drawings, which resulted in subthemes presented in the structure of the group’s thoughts. Some reports indicated the communication of hallucinated individuals, whose content was translated as surreal.

The second meeting took place one month and 15 days after the first, when another affective breakfast was held, when the material produced during the first meeting was validated and new material was produced. The instrument “Experience of Socio-Communicative Senses of the Body”, printed on an A4 sheet, which consisted of six questions about perception, through each bodily sense, was distributed and then completed by each student. The dialogue, which took one hour and 30 minutes, allowed the group to think of communication during care, without losing the patient out of sight.

After the reading and triangulation of the entire material, it was clear that they perceive verbal and non-verbal communication with the patient and vice-versa, based on each bodily sense. The ideas were regrouped, following the criteria of similarities and differences, starting from the influence of the senses in the capturing of communication in mental health care.

The two thematic units addressed the communication perceived by the senses, indicating intervention, approximation, expanded listening and attention: and the meaning of communication, indicating behavior, language, disorders, defense mechanisms, approximation and needs for improvements in care.

The study was developed in compliance with the national and international standards for research involving human beings.

Results

The patients’ characteristics mostly showed students between 20 and 24 years of age (n=21) and a smaller part between 25 and 27 years (n=2). Female students were predominant (n=19).

About their earlier experiences in mental health, a significant part affirmed they had none (n=13), neither during childhood nor even in their undergraduate program, which can affect the student’s understanding of the other, his/her care needs during interaction and care directly or not.

The communication perceived by the senses and the meanings of communication is described by the Sense Heart when 8.5% of the students highlight that they thought of it because they found it broken, anguished; the heart enhances the desire to help the patient, to socialize him and to deliver more humanized care. And communication can only take place when one is able to have affinity and establish a good relation with the patient.

In the Sense Smell, 17% of the participants identified people and care to be delivered, when the smell is impregnated in the environment, in the bodies of the patients due to the long hospitalization and which also creates an olfactory memory in which it moves through the care context. The bad small distances the student from direct contact, despite indicating the need for personal hygiene care. For some, the group of patients in the environment produces an unpleasant characteristic. And removing them more often from the place was indicated
as a strategy to break the enclosure and promote the ventilation of the bodies and the environment.

The Sense Taste defined a communication pattern through the position adopted between the participant and the patient, as 8.5% highlighted. Disgust and approximation difficulties were found, as well as desire to correct the bodily care deficit. When the prejudice is overcome, this enhances the ability to interact, visualize the extent to which the patient needs care, as well as great learning in this care experience, for patients as well as students. Positive feedback occurs in the form of relating and caring.

In the Sense Hearing, this sense was broad in order to resize the form of perceiving and taking care of patients with mental disorders in 13% of the participants. They highlighted that, often, listening is left aside, simply because the patient is having an episode, problems, with intensification of the disorder. Listening often boils down to containing. For the students, active listening is important, as the key and efficient tool to hear the patient, take measures and personalize care.

Communication in hospital environments permeated the attitude, understanding, willingness, help, listening and welcoming. For a further 13% of the participants, everything the patient reproduces in the interaction is meaningful, as the maintained approximation demonstrates interest in looking and listening, in order to assess the structure of thought through the verbal and bodily language.

The evidences from the Sense Sight in 17% of the students captured the patient’s needs and translated their own, a perceptible organ, an actual radar that contributes to the assessment of the mood, behavior, the actual mental examination, or any other situation that can conduct the care targets and interventions. It permits perceiving the patient’s request for help, the need for attention and indicates trajectories for the intervention. Sensitivity is needed to look/see and be useful when they go, return, walk again, stop by your side, keep looking, sit next to you, or simply when they say something.

In the Sense Touch, 23% of the students indicated a mediating sense of interaction and care. They considered communication through that sense. It was a sense all of them used cautiously, as the patients’ affective lack can cause abuses. They evidenced the need for care with the skin, the long nails always yellowish due to cigarettes. And nursing professionals need to evolve in the care delivered to these clients.

Discussion

Although the participants display a young pattern of future nurses, with perspectives of delivering distinguished care, in view of the full potential, wealth and zeal in the description of their perception, the participation in comparison with the total number of students enrolled for the course was limited, which represents a study limitation.

Female and single participants were predominant, which can influence the availability of more time to study, and sharing perceptions through the bodily senses reduce the insecurity regarding the patient’s behavior, as a result of auditory and visual hallucinations and/or deliria.

We learned from the students, as they were at the center of the approach, as essential elements of the learning process, with horizontality in the participation and understanding of the results. The dialogic space permitted the listening through the meanings and served as a self-knowledge device for the students, whose perceptions of patients with mental disorders exerted positive influence.(4)

Dialectically, the heart reveals what the other feels, attempting to undertake efforts to support care. By acknowledging and assuming that the heart, inside the body, makes the other senses feel, it is understood what this represents for each person, for his/her professional identity and for the quality of the communication in care for patients with mental disorders.

Thus, the sense smell gains the position of a mute sense, which does not need a translator, but is the most direct of the senses, with an immediate effect. Therefore, in order to be an active subject of learning, one needs to seek knowledge, mobilizing the intellectual, creative and expressive capacity.
when confronted with situations with bad smells that indicate lack of hygiene or physical alterations that need intervention.

In the taste, we find an intimate and social sense, of attraction or repulsion. The isolation was evidenced and permitted the understanding of what facial expressions reveal about mental conditions, with physiological correlations with internalized signs of anguish. The students need to know how to go beyond the prescribed, to know how to negotiate, decide, act and react pertinently, deciphering what they feel and how they cope with the process. Thus, the construction of competences for interaction is developed.

One of the main barriers to identify disorders is the presence of stigma that affects people, both discrimination and abuse in relationships, such as the patient’s self-segregation, effective stigma and different conceptions of health and disease between the population and the health professionals in general.

Thanks to the mechanism used by external listeners, of capturing and taking the sound inside the ear, we hear the sounds twice. Listening is an important therapeutic communication technique, due to the need to assess early what is not said, or what is prohibited by or through it, but also the need to resignify the concept in order to accomplish an act that can generate effective care.

This listening needs to be sensitive, as the patient’s behavior demonstrates that he hears things much more than twice and as staying close can interfere favorably in his recovery. The students were able to listen and listened reflexively in communication and interaction, as they experienced support as a therapeutic measure in understanding the patient with involvement and listening. Through the interview and therapeutic communication skills, their confidence increased and, at the same time, their anxiety level dropped.

In mental health teaching, the sense sight should be highlighted, as it is the matrix that attributes a special meaning to the content of the immediate perception and that affects communication. Touching by sight is a form of communication, through spontaneity, expressiveness and affection. And, in the interaction with the patient, touch can be expressive-instrumental, when it combines technical and expressive skills.

It was evidenced here that the physical caution between student and patient was necessary during the interaction. Nevertheless, there was also a clear sensitivity present in the different forms of wanting to perceive and help, and in the strategies proposed to attend to their needs based on personalized care.

Touch imprints singularities and is capable of triggering feelings and various emotions among human beings. The female gender is capable of demonstrating them, about 70% with greater precision. Due to different sensory stimuli in childhood, adolescence and the adult phase, the emotions between men and women are also distinct. Differences are clear, as well as their effects and the singular gender description of who touches and is touched.

This study favored the discussion among the students about their behavior and that of the patients with mental disorders, reducing obstacles in the form of perceiving it. The insecurity in the relationship in view of the psychiatric symptoms can be related to the difficulty to decipher the facial expressions and negative emotions.

The specialty requires a corpus of knowledge that guides, regulates and directs their practice, and the proposed research experience promoted thinking and feeling with one’s own body and the bodily senses. The socio-communicative device served as a source of learning and development of the intellectual, psycho-affective and interactive skills.

The students reflected on their perceptions, identifying strong and weak points in the communication with and care of mental patients. Based on the dialogue, they were stimulated to develop their reflexive skills before starting the practical supervised curricular training activities with these clients and group dialogue can improve the interactive skills and enhance safety before meeting these patients in a clinical experience. The knowledge incorporated during their training about therapeu-
tic communication is an important content group in mental health nursing.\(^{(11)}\)

Work pressure, limited communication skills and restricted time for care were also indicated as weaknesses in the mental health nursing team’s care.\(^{(12)}\) The students appointed fundamental aspects of the nursing practice, such as therapeutic communication and the quality of the patient’s hygiene. Practicing concepts about the clinic, care and communication was positive and beneficial, as the students do not always have this opportunity in the curricular phase and in clinical practice.\(^{(13)}\)

The use of paper, cognitive/behavioral techniques and specific didactic information on how to interpret the patient communication barriers\(^{(14)}\) for care benefitted the students due to the ease in the connection process between thinking and feeling. Knowing that the patient’s behavior results, among other clinical causes, from the auditory and visual hallucinations and/or delirium should not represent unsafe acts for the student in the interaction with the patient, nor should the unfavorable work conditions restrict communication in care delivery.

The value and experience of the senses to translate non-verbal communication showed the factors that influence the perceived expression of non-verbal signs and reveals the influence of background demographic effects like the patient’s gender, voice and appearance and non-verbal communication metaphors, which is divided in four subthemes: care delivery, individualization, giving tips and promoting the interaction.\(^{(15)}\)

**Conclusion**

The nursing students’ bodily senses register and express the mental patients’ verbal and non-verbal communication through feeling, behavior and the bodily conditions that issued care needs. These three elements, present in the care context, sensitized the student to the range of meanings and to a punctual communication, which would attend to the true care demands of mental patients.

**Collaborations**

Azevedo AL contributed to the project conception, research execution, planning, data analysis and interpretation, elaboration of the manuscript, relevant critical review of the intellectual content and final approval of the version for publication. Araújo STC contributed to the project conception, research execution, planning, data analysis and interpretation, elaboration of the manuscript, relevant critical review of the intellectual content and final approval of the version for publication. Vidal VLL cooperated with the relevant critical review of the intellectual content and final approval of the version for publication.

**References**


Perception of the residents about their performance in the multidisciplinary residency program

Percepção dos residentes sobre sua atuação no programa de residência multiprofissional

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Keywords
Postgraduate education in nursing; Internship and residency; Research in nursing education; Health education; Patient care team/education

Abstract
Objective: Understanding the meanings of the training experiences of postgraduate students of the Multidisciplinary Residency Program in Health linked to a federal educational institution.
Methods: An exploratory and descriptive study with qualitative approach carried out with postgraduate students of a Multidisciplinary Residency Program in Health. The data collection was held through a semi-structured interview. The data obtained in the speeches were categorized by the content analysis technique.
Results: Four thematic categories were unveiled: the residency and multidisciplinary practice, the residency as practice of teamwork, recognition of the resident’s work by users and the residency experience in the context of health work.
Conclusion: The Multidisciplinary Residency Program is understood as a significant opportunity of learning and having contact with professionals from different fields where the comprehensive care is provided in professional practice, with the awareness that the assistance should contemplate the social, environmental and psychological aspects of individuals.

Resumo
Objetivo: Compreender os significados das experiências de formação dos pós-graduandos do programa de Residência Multiprofissional em Saúde vinculado a uma instituição federal de ensino.
Métodos: Pesquisa exploratória, descritiva com abordagem qualitativa, realizada com pós-graduandos de um Programa de Residência Multiprofissional em Saúde. Realizada coleta de dados através de entrevista semiestruturada, sendo os dados obtidos nos discursos categorizados através da técnica de análise de conteúdo.
Resultados: Foram desveladas quatro categorias temáticas: a residência e prática multiprofissional, a residência como prática do trabalho em equipe, reconhecimento do trabalho do residente pelo usuário e a experiência da residência no contexto do trabalho em saúde.
Conclusão: O Programa de Residência Multiprofissional é compreendido como uma oportunidade significativa de aprendizado e contato com profissionais de diferentes áreas, onde se efetua o cuidado integral na prática profissional com a concientização de que a assistência deve contemplar os aspectos sociais, ambientais e psicológicos do indivíduo.

Keywords
Postgraduate education in nursing; Internship and residency; Research in nursing education; Health education; Patient care team/education

Descritores
Educação de pós-graduação em enfermagem; Internato e residência; Pesquisa em educação em Enfermagem; Educação em saúde; Equipe interdisciplinar de saúde/educação

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Introduction

The changes in the training of health professionals have gained importance in the world, and the Brazilian Ministry of Health assumed the responsibility of guiding the training of these professionals in order to meet the needs of the Unified Health System (SUS - Sistema Único de Saúde).

After the implementation of the resolution on the national curriculum guidelines for the health undergraduate courses in Brazil, there was incentive to the generalist professional training, with skills related to attention to health, decision making, communication, leadership, administration, management and continuing education.

In recent years, there was a significant increase in demand of applicants for health specialization courses, and the broad creation of postgraduation courses of the lato sensu type (specialization). In the area of nursing, the demand for these courses is justified by the search for qualification and certification for insertion in the labor market and a better professional position.

In Brazil, the type of education called Residency has established itself as specialization in the health area, aiming at promoting changes in the training of professionals regarding the medical model of care. The Ministry of Health proposes the strategy of the Postgraduate courses – Lato Sensu with programs of Multidisciplinary Residency in Health focused on the education in service destined to other areas of health.

The intention with this model is to train professionals to understand the multiple causes of individual and collective morbid processes, contextualizing individuals in their environment, covering the areas of Nursing, Pharmacy, Physiotherapy, Speech Therapy, Medicine, Nutrition, Dentistry, Psychology, Social Work and Occupational Therapy.

It is an intersectoral cooperation program that encourages the qualified insertion of young professionals in the job market, guided by the principles and guidelines of the unified health system, from the local and regional needs and realities. Therefore, the National Commission of Multidisciplinary Residency in Health was established with the duties of registering, evaluating and accrediting the programs.

It is characterized by the education and training in service, and aims to promote the specialization of health professionals in aspects that enable the professional practice with excellence in the areas of comprehensive health care, management and organization of work, and health education, involving people and communities and seeking to improve the quality of life.

The programs were established with a minimum duration of two years, total workload of 5760 hours, divided in 80% of the time for practical activities and 20% for theoretical or theoretical-practical activities, 60 hours per week and prioritizing the activities in Primary Health Care and the Hospital.

The objective of this study was to understand the meaning of the training experiences of residents and its articulation with workers in the practice fields.

Methods

This is a descriptive study of qualitative approach. The researchers with experience and stricto sensu postgraduate training were the facilitators and guides of the study, with the participation of a nursing undergraduate student on a fellowship program.

The research interest arose from the need to know the perception of the multidisciplinary residents about their actions in the practice setting. It is expected that this knowledge will support proposals for a new area in the residency program of the institution.

Firstly, a list with the names of the areas of practice, telephone, e-mail and place of practice of the program residents was requested to the coordinator of the multidisciplinary residency program. Subsequently, the approach method was carried out via contact by telephone or email with them to proceed with the invitation to participate in the research.

After the acceptance, there was personal contact with the participants, who received the free and informed consent form, scheduled the inter-
view and chose when and where it would happen. As the study authors were not part of the residency program, they did not have any relationship with the subjects.

The study population were the residents in the first and second years of the multidisciplinary residency program, from different backgrounds within the health area, and that had demonstrated interest and willingness to participate in a previous contact. The sample consisted of 16 subjects, defined by the data saturation criterion, and two interviews were discarded, thus accounting 14 residents in total.

The data collection was carried out in a private place, in rooms provided by the service in the resident’s practice field. The interviews were conducted using the assumptions of the semi-structured interview, with the following guiding question: “How do you perceive your role in the scenario of practice? Why?”

Thus, the subjects had the opportunity to speak about the studied issue. A test was carried out prior to the implementation of data collection to adjust the guiding question. The interviews were digitally audio recorded and the speeches were transcribed in full afterwards. The recorded conversations were made available by digital files. There were records available in a field diary too. The interviews lasted 1-3 hours on average.

The theoretical saturation is defined as the set that will support the analysis and interpretation of data from the experience of the researcher in the search field. This saturation was determined by the researchers when they observed that data collection through new interviews would not add many elements to the discussion in relation to the theoretical density already obtained.

The methodological framework of the Content Analysis was used, constituted by the following phases: pre-analysis; exploration of the material; and treatment of results, inference and interpretation.

After transcription, the residents had the opportunity to read their interviews and validate their contents. The data were coded from the registration units. In the last step was done the categorization of speeches, which is the classification of elements according to their similarities and differences, with subsequent reunification according to the common characteristics, thereby generating thematic categories that are relevant for the data obtained. For the categorization, were used codes for the units of meaning, followed by the number corresponding to the speech.

The development of the study met the national and international standards of ethics in research involving human subjects.

**Results**

The study participants were 14 residents, predominantly female, 13 (92.8%), and 12 were aged between 22 and 27 years (85.8%). Three physical educators, three nurses, a nutritionist, two occupational therapists, a biomedical, a physical therapist, and three social workers were interviewed. Most subjects, nine (64.3%), have been working for a year and the other five (35.7%) for three months.In total, four thematic categories were identified: 1. The residency and multidisciplinary practice; 2. The residency as practice of teamwork; 3. Recognition of the resident’s work by users and 4. The residency experience in the context of health work.

1. **The residency and multidisciplinary practice**

It refers to the residents’ understanding about the meaning of multidisciplinary practice. They report that the residency brings the opportunity of acquiring new knowledge about other areas, making that different professions help and complement each other.

The full care to patients has a comprehensive view, treating them not only as patients, but meeting their needs.

The residents realize that in order to work in a multidisciplinary form, they must be aware of the role of each subject. They mentioned that it is important to discuss the cases of the patients seen to provide an expanded multidisciplinary care.
2. The residency as practice of teamwork

The subjects report about the teamwork in residency, that it is seen as a great opportunity of learning, contact and exchange of knowledge and experiences with professionals from other areas.

The medical residents seek to perform their duties jointly, and always sharing with another professional from a distinct area. In cases when patients need care beyond their competence, they demonstrate knowing how to act and make the referrals.

The residents realize that although the work is done as a team, all professionals must have their own individuality, not interfering with the action of others, but contributing to the development of the multidisciplinary practice for the benefit of patients.

3. Recognition of the resident's work by users

The subjects unveiled the acceptance and recognition of patients towards professionals and the care. They feel valued and appreciated when the users show satisfaction with the care provided, and recognize their own roles.

The residents were satisfied with the recognition of patients. They find that the actions developed in the program are beneficial to them through the qualified care, evidenced by the return and attendance to the service, as well as the constant participation in the activities proposed by the professionals.

4. The residency experience in the context of health work

As for the differences of acting in the hospital and in primary care, the subjects show that the hospital environment involves immediate action and intervention, and has better resources for the appropriate care to patients. However, they realize that the assistance in primary care is dynamic and comprehensive, although also exhausting, because the resources not always meet the professionals’ needs for developing their care activities.

The perception of residents about the user embracement at the hospital is opposed to that performed in the Basic Health Unit (UBS – Unidade Básica de Saúde) because the latter allows different approaches. At the hospital, the care is directed to the fragmented and individualized assistance, insufficiently comprehensive, focused on the situation of acute disease or worsened chronic disease. Thus, the assistance is directed to technical procedures, despite the residency program having the comprehensive and full care as a principle.

At the UBS, the professional performance is based on people as a whole, extending the care to their homes. This approach allows to include their families through the implementation of home visits that provide a better tracking of users, encouraging the adherence to treatment, prevention and health promotion.

Discussion

This study is limited to the knowledge of the perceptions showed by the residents in a qualitative-interpretative approach. Therefore, it is necessary to expand the understanding of these subjects’ experiences from other methodological approaches and new research on this topic.

The results of this study lead to an understanding of the realities of education and assistance experienced by the residents, which contributes by adding knowledge to the professional training process of the residents for the SUS.

In the residency category and the multidisciplinary practice, the participants recognize that the training process must be articulated, ensuring the participation of different health professions in building a collective knowledge, and adding contributions of the different professional cores included in this process.

The collective construction of knowledge, one of the objectives of this training module, can put into practice the development of an innovative proposal for assistance, in addition to expanding the possibilities of action with the health multidisciplinary teams and the community.\(^{10,11}\)

The multidisciplinary approach provides interaction between many types of technical and specific knowledge, and new intervention proposals emerge from this interaction, which could not be achieved.
Perception of the residents about their performance in the multidisciplinary residency program

by any professional in isolation, but as the result of uniting different kinds of knowledge.

The multidisciplinary practice is characterized by the differences of professions, using this criterion to aggregate knowledge of each area and thus, the residency contributes both to the integration of knowledge as to the learning of teamwork.\(^{(12)}\)

Regarding the thematic category of residency as practice of teamwork, the residents observe the importance of integration between the various areas of expertise for developing care with quality.

The concept of multidisciplinary teamwork implies in common goals, shared team identity, shared commitment, clear team roles and responsibilities, interdependence among the team members and integration of the working methods. The clarity of the professional roles of every member is a key factor, because it may allow a broad understanding of both their own professional roles and the professional duties of their other colleagues.\(^{(13)}\)

Studies show that the joint and shared actions, the appreciation of health professionals, the active methodologies at work, the exchange of information and the mastery of skills are fundamental principles in the current processes of health production.\(^{(14-16)}\)

Therefore, it is necessary to transform isolated work in collective work, in which there is appreciation of the work of others, because in the multidisciplinary and interdisciplinary exercise happens the apprehension of multiple knowledge and practices, where actions converge and enable teamwork.\(^{(17)}\)

Studies indicate that the notion of teamwork is etymologically associated with performing tasks and sharing work among individuals, as the basis for integral actions in health that require the active participation of its members and the conjunction of comprehension of each area of knowledge in the implementation of joint projects to improve the health status of the people.\(^{(2,17,18)}\)

The importance of the interactive nature of work implies knowing and understanding the participation of the subjects involved in providing services and health actions, seeking an integral and effective care.\(^{(2)}\)

It is emphasized that teamwork does not require abolishing the specificities of each professional. The technical differences can enable the contribution of labor division for improving the quality of services provided, to the extent that the specialty allows the improvement of knowledge, technical performance in each area, and a greater production.\(^{(19)}\)

Thus, the multidisciplinary practice differs from teamwork because it consists in the mutual interaction between the different areas in health, in the articulation of knowledge and the division of labor. This situation allows that health professionals analyze the patients widely and fully, going beyond the specificities of their professional practice, where all seek to achieve joint goals and there is awareness on how the activities of every one are important in order to reach such goals.\(^{(2,20)}\)

Regarding the recognition of the resident’s work by users, it is observed that the bond between professionals and users is established from a relationship of trust, favoring the adherence to hospital treatment and the participation in the programs developed by the teams.

Studies have shown the importance of professionals earning the trust of users and their families, and the recognition of professionals as participants in their treatment process. Thus, the established bond is a result of the close relationship between the team and the population, which stimulates their autonomy and participation in the care process, in a relationship of respect and appreciation of their individualities.\(^{(21-23)}\)

The assistance provides a stronger bond between nurses and users when it meets their individual needs, generating satisfaction and professional recognition.

Studies emphasize the importance of considering objective and subjective issues inherent to human beings in the assistance, since health actions should be permeated by interpersonal relationships, considering the family, individual and social aspects of patients, as well as their rights.\(^{(24,25)}\)

Regarding the residency experience in the context of health work, the residents realize that the care provided in the hospital and the UBS occur differently, according to their specificities.
The residents see the UBS as establishments that offer comprehensive service to the community by considering the aspects oriented to the social, psychological, environmental and biological needs of users. However, there are lacks of human and material resources in this work environment, which are necessary to ensure the completeness of health actions. The organization of the multidisciplinary teamwork needs new ways of enabling the collective work that overcome the structural difficulties of the practice in this environment.(26)

The subjects see the hospital environment as a model of care focused on the disease and clinical management, ignoring factors such as psychosocial determinants of health, and the environment. In the hospital, the health care depends on the joint work of several professionals, where the care received by patients is the result of small partial assistances, which will complement each other, explicitly or implicitly, from the interaction among the various caregivers.(27)

The clinical performance focused on disease, prescription and treatment is of fundamental importance in the context of health care. However, we believe that it should be associated with a broader view of health that incorporates skills to the performance of professionals and allows them to have a humanistic and holistic view of the health-disease process in the political, economic, educational and family aspects, among others.

The program of Multidisciplinary Residency in Health aims at initiatives that can modify this scenario and favor assistance, such as the formation of discussion groups, inclusion of other team members in the studies, the monitoring of cases, the inclusion of family members, among others. These practices can assist in achieving a more humanized and holistic care, providing better quality of life.

Conclusion

The multidisciplinary residency program in health was understood as a significant opportunity of learning and having contact with professionals from different fields, allowing residents to take a new behavior in their professional practice, where assistance to users acquires a more humane and comprehensive character through the effective sharing of specific knowledge in each area and participation in health activities.

Collaborations

Silva JC; Contim D; Ohl RIB, Chavaglia SRR and Amaral EMS declare to have contributed to the conception and design, analysis and interpretation of data, article writing, critical review of the relevant intellectual content and final approval of the version to be published.

References


Graduate distance education in nursing: assessment under students’ perspective

Educação de pós-graduação em enfermagem à distância: avaliação sob a perspectiva dos discentes

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Abstract

Objective: To evaluate the distance learning Graduate Nursing Management Program according to the students’ perspective.

Methods: This exploratory-descriptive study with a quantitative approach involved 484 students who had completed the nursing program. For the assessment we used an instrument divided into the following categories: access location, hours dedicated to the program, professors, mentors, students’ expectations and general assessment. Association among numerical variables was done using a Pearson’s chi-square test, and measurement reliability was assessed with the Cronbach’s alpha coefficient.

Results: Main results showed that students felt welcomed by mentors and professors and that two courses helped improve professional performance and development of competencies related to management.

Conclusion: Courses were evaluated positively and were perceived as a useful tool for training of nurses aim to support transformation of management scenario of Brazilian nursing.

Keywords
Education, distance; Education, nursing; Education, nursing, graduate; Educational measurement; Health management

Descritores
Educação à distância; Educação em enfermagem; Educação de pós-graduação em enfermagem; Avaliação educacional; Gestão em saúde

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Introduction

Progress in information technology and telecommunication and the development of the Internet have led to an increase in distance education. As a result this important, low-cost and easily accessible tool for diffusing education and knowledge can be used to assist even more individuals who seek training to face the challenges of the job market.\(^1\) Emphasis has been given to studies comparing distance education with traditional education, and improved efficiency has been reported for those who adopted the distance modality instead attending courses in a classroom.\(^2\)

In Brazil, distance education has been consolidated as an efficient strategy to address the social need for universal access to education. The National Telehealth Program in Brazil, a project of the Ministry of Health in distance education, has trained 154 teams to work on the Family Health Strategy and provide health support via telehealth services to 80 Brazilian municipalities. Nurses constitute the largest group of professionals attending the courses.\(^3\)

Two other initiatives for this program exist. The first is a distance education module for nurses that addresses anti-sepsis in intramuscular pre-medication. This module uses the Modular Object-Oriented Dynamic Learning Environment (Moodle) as the virtual learning environment.\(^4\) The second is an endocrine physiology module for undergraduate nursing students who use the TelEdu®, a virtual environment developed by the Universidade Estadual de Campinas.\(^5\) Both modules support the teaching-learning process of the subjects proposed, and that addressing the expectation of pedagogical proposal.

The Nursing College of São Paulo at Universidade Federal de São Paulo began offering a lato sensu graduate program via distance learning in 1998 with the Specialization Distance Program for Nursing in Nephrology and, subsequently, the Nursing Program in Infectious Diseases and Prenatal Care. This distance learning program has been also used in international programs to develop nurses’ skills in undergraduate and graduate programs.\(^6\)-\(^8\)

To contribute to the training of nurses, the Nursing College of São Paulo established a partnership with the Open University of Brazil to offer a Specialization Course in Nursing Management in a distance format. The main objective of this program is to train nurses to act with a critical and competent approach in nursing care administration in health services. The first group of students completing this program graduated in 2009 and the second group, in 2010.

Courses load consists of 416 hours, distributed in 11 disciplines. The program is free to the student and is sponsored by the Open University of Brazil. At each term 550 spaces are offered, equally distributed among available authorized sites.

To complete the course, the students are expected to dedicate 10 hours a week of studies, using Moodle as the virtual learning environment.

Interaction with students occurs mainly with distance mentors (in a proportion of one for every 25 students) and on-site mentors (one for each site), via discussion panels, and through individual messages. In the second course, we included a communication channel with a moderator and a social panel called Web coffe.

Learning was assessed weekly after presentation of each topic through use of a test with autocorrected responses. In addition, activities were conducted through the discussion panels, with the objective of correlating acquired knowledge in theory with professional experience in practice.

In the first iteration of the course, student participation in discussion panels was not mandatory or evaluated. Thus, we observed that students did not completely explore or use the tool, even with continual invitations sent by the moderators. With the second course, participation in discussions panels was graded according to an assessment of students’ posts. This approach enhanced the frequency of students’ participation in on-line discussions.

Two on-site meetings were done on sites. The first meeting occurred midway through the course and the second upon presentation of the final paper, general test, and course assessment. In the second iteration of the course, a welcome greeting and pre-
presentation were done by the program coordinator by web conferencing.

This study evaluated the distance education version of the Specialization Program in Nursing Management according to the students’ perspectives.

Methods

This exploratory, descriptive analysis with a quantitative approach was developed for two distance courses in Nursing Management at the Nursing College of São Paulo at Universidade Federal de São Paulo.

The study population consisted of 495 students in the first group and 427 in the second group, totaling 922 students. We included in the study students who concluded the program and signed the consent form. The final sample was composed of 216 students in the first group and 268 students in the second group.

The assessment instrument was a semi-structured questionnaire based on quality indicators for distance undergraduate program already established in Brazil that was divided into six categories: access location, hours dedicated to the program, professors, mentors, students’ expectations, and general assessment. We considered the following answers: yes, no, partially, and not applicable; general assessment was considered as excellent, good, fair, or poor.

This instrument was evaluated by three specialists with experience in nursing management and distance education courses. The specialists suggested small reformulations, and all suggested changes to the questionnaire were made.

Data were collected on-site on the day of the final paper presentation during two periods. Data from the first group were collected in the second semester of 2010 and data from the second group were collected in the second semester of 2011.

Data were tabulated in the Statistical Package for Social Science software program for descriptive statistical analysis. Association between numerical variables of groups from the two courses was evaluated using a Pearson’s chi-squared test, with a significance level of 5% (p<0.05), and internal consistency analysis of interviewees’ responses. The Cronbach’s alpha coefficient and item/instrument factor correlation were done to determine measurement reliability.

Development of this study followed national and international ethical standards for research on human subjects.

Results

This study sample was predominantly composed of women (90% in course 1; 91% in course 2). Participants ages ranged between 20 and 30 years (46% of both sexes) and between 31 and 40 years (36% in course 1; 34% in course 2) and the maximum time from graduation was 10 years. The latter finding was significantly different (p<0.001).

The most common place where students accessed the course was home (85% in course 1; 72% in course 2; p<0.01). Students reported that they dedicated on average 2 to 4 hours on activities for the course (42% in course 1 and 41 in course 2), some students reported dedicating more than 8 hours (10% in course 1 and 14% in course two). This result shows that students from both groups dedicated an equal number of hours to course activities (p=0.441).

Professors’ performance in the course was evaluated positively. A total of 87% of students in — course 1 and 95.9% in course 2 felt welcomed by professors (p<0.001). Approximately 85% of students in course 1 and 93.7% in course 2 believed that the professors resolved scientific inquires (p=0.002), according to table 1.

Findings showed that 85.2% of students in course one and 96.6% of those in course 2 felt welcomed by both the distance mentor and the on-site mentor from his/her site. When students were asked whether the distance mentor was helpful in the discussions panels, most responded yes (88.4% in course one and 96.3% in course 2). These data also presented significant difference in both subjects (p<0.001; p<0.019, respectively), i.e., students in both courses had different opinions related to the tutorial, as shown in table 2.
Regarding students’ expectations of the course, 97.7% of students in course 1 and 98.1% of students in course 2 felt that the course contributed to his/her professional performance. Approximately 98% of students in both courses reported that the course contributed to the development of competencies related to management.

The course was considered excellent by 46.3% of students in course 1 and 59.3% of those in course 2; very good by 44% and 36.6%, respectively; and good by 9.3% and 4.1%, respectively. A significant different was observed between courses (p<0.001), i.e., students in course 2 evaluated the program more positively than did students in course 1.

### Discussion

Limitations of this study include the following: a Brazilian reference was used to create the instrument, which has not yet been validated; and the assessment instrument for course 2 included some questions that were not included for the assessment of course 1 and were not included in our study. We chose not to include these questions because they would have introduced additional information into the discussion about students’ opinions.

Another important factor was that Nursing Management courses enable nurses to experience several different scenarios from Brazilian’s perspective, which allow them to explore a number of media and management tools that must be used to plan and implement safe care delivery for patients.

Most students were women. This result corroborates those of other author studies, although more men appear to be pursuing the nursing course in Brazil.

Researchers have been reporting that some groups are seeking distance courses, particularly women, because this modality permits them to devote time for seeking knowledge and reduces the difficulties women with two jobs face, activities at home, and parenting activities.

Regarding age ranges, we observed that young individuals and recent graduates are those looking for courses in Nursing Management. This finding corroborates job-market results showing that young nurses are being hired for management positions.

This framework converges with the contemporary societal demand that nurses have technical experience and skills, such as leadership, teamwork, customer focus and decision making.

The study findings regarding access location for the course agree with those of another study conducted in Taiwan. In that study, students reported that the ability to access the course from home reduced time that would have been spent in...
traffic had the student attended an on-site course and decreased the impact on family life because participants could spend more time with their family. Such findings confirm the flexibility that distance learning permits.

Concerning hours dedicated to the course, we observed a small percentage of students who dedicated more than 8 hours a week. The relevance of dedication to studies is shown in other surveys conducted among nursing undergraduate students and graduate students in epidemiology. These surveys verified that on-line modality, time organization and self-discipline and self-motivation are key elements to students’ success in completing the course.\(^{(13,14)}\)

In our study, more students from course 2 than in course 1 assessed professors in relation to how welcoming they were and how well they clarified students’ doubts.

Some authors believe that, in addition to selecting and rewriting texts in the discipline and organizing didactic material, distance educators must pursue basic skills, such as use of information technologies and communication to select, use and evaluate educational interventions (synchronous or asynchronous) that are helpful for students and are appropriate for the chosen learning environment. Another important aspect is the development of interactive activities from the pedagogical point of view; such actions must be also constructive, continuous and collaborative.\(^{(15)}\)

In alignment with ideas of others studies, in course 1 the professors’ main focus was to elaborate didactic material and content for grades; the distance mentor and the professor divided the tasks of providing guidance and answering questions. In course 2, each professor recorded videos of presentations of their material, created a video class, and participated effectively in discussion panels. These activities, in turn, improved increase interaction with students and encouraged learning and knowledge construction.

The mentor moderated discussions and forwarded specific questions to the responsible professor; the student then received a private answer. This approach sought to better involve the student in the course.

Our results confirm the importance of mentors’ role in distance education, which has been discussed by other researchers.\(^{(16)}\) Mentors play an essential role in the facilitation and structuring of individual cognitive networks, promoting among students and professors spaces for a collective construction of knowledge. Hence, mentors have a substantial impact on students’ performance, in addition to improving understanding level through mediation and facilitating interaction among students.

In the tutorial for course 1, mentors followed students regarding participation in activities, adherence to deadlines and participation in panels on the course content. The mentors clarified the students’ doubts and promoted the interface between student and professor. In course 2, the main focus was the collaborative work, welcoming the students, ensuring effective participation in panels, assessing posts made by students in relation to the pertinence of the answer, and helping improve communication (24 hours was established as the maximal time in which to respond to students). These actions were critical to increasing interaction and made mentors the reference point for students within the learning environment.

On the other hand, on-site mentors acted locally, helping students in all structural and pedagogical aspects of the course.\(^{(17)}\) In course 1, on-site mentors were guided to receive the student in the site in order to address the students’ concerns about the use of the platform and orient the students regarding the course timeline, didactic material, grades and activities. In course 2, we actively searched for students who had been inactive regarding online access for more than seven days. We communicated with such students by phone, e-mail and telegram in order to reduce dropouts.

Concerning students’ expectations, we emphasize the relevance of the graduate course in nursing management for training of Brazilian nurses in management aspects. These professionals were originally from several different locations in the country and reflect many different practice scenarios (mainly hospitals and the public health arena).
A similar situation occurred in a study done in Brazil,\(^{(18)}\) where students had the opportunity to learn about fundamental administration ideologies and theories, intervention, and practice methods for resource management, with the aim of developing and transforming their professional practice.

We verified in students’ answers that courses helped students develop the management skills. This result agrees with findings in the literature.\(^{(19,20)}\) It is important to highlight that the competencies mentioned above were covered in this course, including supervision, leadership and decision making.

Results of our study in relation to assessment of the course agree with studies showing that success in an online model is linked to malleability concerning traditional education alternatives, enabling the student to attend the course at his/her own pace. Distance learning course allow students to balance learning with personal appointments and work and democratize the students’ opportunities for personal, professional and social development.\(^{(21,22)}\)

**Conclusion**

Students of both courses provided positive evaluations of the courses, although most criteria significantly differed between course 2 and course 1. We conclude that changes applied in course 2 improved the construction of knowledge and prepared nurses to intervene and transform their professional practice. The changes also could help professionals respond to the demands of health management in Brazil and worldwide.

**Acknowledgments**

We thank Josiane Francisca Godoy Parra for the partnership and hours spent with our group dedicated to activities of courses 1 and 2.

**Collaborations**

Alves VLS contributed to the conception of the study, analysis and interpretation of data, drafting the manuscript. Bohomol E cooperated to the conception of the study, analysis and interpretation of data, drafting the manuscript, critical review of intellectual content. Cunha ICKO contributed with conception of the project, analysis and interpretation of data and approval of final version.

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Mechanical ventilation and acute kidney injury in patients in the intensive care unit

Ventilação mecânica e a lesão renal aguda em pacientes na unidade de terapia intensiva

Luana Leonel dos Santos
Marcia Cristina da Silva Magro

Abstract

Objective: To verify the impact of mechanical ventilation use in patients admitted to the intensive care unit and the incidence of acute kidney injury.

Methods: A prospective, quantitative cohort study of 27 patients receiving mechanical ventilatory support while hospitalized in the intensive care unit of a public hospital.

Results: The majority (55.6%) of patients were classified according to the kidney injury stages listed in the Risk, Injury, Failure, Loss, End-Stage (RIFLE) classification. Of these patients, 45.8% received mechanical ventilation with between 5 and 10 cmH2O positive end-expiratory pressure and progressed to acute kidney injury. The Acute Physiology and Chronic Health Disease Classification System II (APACHE II) was significantly associated with renal dysfunction (p = 0.046).

Conclusion: The use of invasive mechanical ventilator support with positive end-expiratory pressure in critically ill patients in intensive care units can impair renal function.

Keywords
Acute kidney injury; Respiration, artificial; Nursing assessment; Intensive care units

Resumo

Objetivo: Verificar o impacto do emprego da ventilação mecânica em pacientes internados na Unidade de Terapia Intensiva e a ocorrência de lesão renal aguda.

Métodos: Estudo de coorte, prospectivo, quantitativo, desenvolvido com 27 pacientes sob suporte de ventilação mecânica internados na unidade de terapia intensiva em um hospital público.

Resultados: A maioria (55,6%) dos pacientes foi classificada no estágio de lesão renal, de acordo com a classificação Risk, Injury, Failure, Loss, End-Stage (RIFLE). Dentre os pacientes, 45,8% estavam sob ventilação mecânica com pressão expiratória final positiva entre 5cmH2O e 10cmH2O, os quais evoluíram com lesão renal aguda. Acute Physiology and Chronic Health Disease Classification System II (APACHE II) apresentou associação significativa com disfunção renal (p=0,046).

Conclusão: O emprego da ventilação mecânica invasiva com pressão expiratória final positiva em pacientes graves pode determinar prejuízos à função renal dos pacientes internados em unidade de terapia intensiva.
**Introduction**

The development of acute kidney injury in hospitalized patients leads to longer hospitalization, with increased treatment costs and mortality rates. This reality reflects the urgent need to implement preventive measures to preserve renal function and minimize complications, along with strategies to decrease the need for renal replacement therapy.

Preventive measures should be initiated on the basis of the assessment of individuals at risk. These measures may be pharmacological or may involve actions to minimize exposure or susceptibility to the development of acute kidney injury.\(^{(1,2)}\)

In the healthcare setting, mechanical ventilation has been a relevant factor in the development of acute kidney injury. The relationship between the lungs and kidneys has been firmly established as clinically important to the health–sickness processes, and several mechanisms have been proposed to explain this association.\(^{(3)}\)

Currently, hemodynamic instability is considered one of the main determinants of acute kidney injury during mechanical ventilation.\(^{(4)}\)

Studies in animal models have indicated that the use of positive end-expiratory pressure >10 cmH\(_2\)O results in a 40% decrease in urinary flow, 23% decrease in creatinine clearance, and 63% decrease in urinary sodium excretion. Studies on humans have also shown that increased positive end-expiratory pressure may cause a decrease in cardiac output, mean arterial pressure, sodium excretion, and glomerular filtration rate after 30 min of its use.\(^{(5)}\)

From this perspective, mechanical ventilation combined with the high positive end-expiratory pressure causes significant changes in the cardiovascular hemodynamics, resulting in decreased renal blood flow. Any reduction in cardiac output affects renal blood flow and consequently the glomerular filtration rate, resulting in a possible prerenal state.\(^{(5,6)}\)

There are three underlying mechanisms for acute kidney injury induced by mechanical ventilation: the effects of arterial blood gases, systemic release of inflammatory agents (biotrauma), and the influence on systemic and renal blood flow.\(^{(7)}\)

Because acute kidney injury often affects individuals under the care of both nephrologists and other health professionals, awareness of this disease should be greater among all health professionals.\(^{(8)}\)

Despite current scientific knowledge, the relationship between mechanical ventilation and the incidence of acute kidney injury remains unclear.\(^{(4)}\) The objective of this study was to investigate the impact of mechanical ventilation in patients admitted to intensive care units and the incidence of acute kidney injury.

**Methods**

This was a prospective, quantitative cohort study conducted in the intensive care unit of a public hospital during the period August 2013 to February 2014.

The patient follow-up period was linked to the period they were exposed to mechanical ventilation.

The study included 27 patients aged >18 years who were exposed to mechanical ventilation with positive end-expiratory pressure and had no previous history of renal dysfunction. Patients with a history of chronic renal insufficiency (glomerular filtration rate <60 mL/min/1.73 m\(^2\)) or kidney transplantation were excluded, as were those hospitalized in the intensive care unit for ≤24 h.

Acute kidney injury was defined as an increase in serum creatinine levels to ≥50% from baseline levels or a decrease in urinary output to <0.5 mL/kg/h for more than 6 hours.\(^{(9)}\)

The selected patients were allocated to groups according to the positive end-expiratory pressure programmed into the ventilator, as follows: Group 1, patients with positive end-expiratory pressure of ≤5 cmH\(_2\)O; Group 2, those with 5–10 cmH\(_2\)O; Group 3, those with ≥10 cmH\(_2\)O.

The results were expressed in absolute and relative frequency, median, and 25\(^{th}\) and 75\(^{th}\) percentiles. The analysis of categorical variables was performed using Fisher’s exact test. Analysis of continuous variables was performed using the Mann–Whitney nonparametric test. P values of <0.05 were considered statistically significant.
This study adhered to the national and international ethical standards in research involving humans.

Results

Twenty-seven mechanically ventilated patients admitted to the intensive care unit were followed up. There was a predominance of males (59.3%) in the study population. The mean age was 50 years, the mean body mass index was 26 kg/m², and 40.7% of the subjects were overweight. The majority (66.7%) of the patients received a continuous infusion of vasoactive drugs, predominantly noradrenaline (53.3%). The mean APACHE II index score was 16 and the median mechanical ventilation time was 11 days. According to the RIFLE classification, all patients developed some stage of compromised renal function, and hypertension was the most frequent comorbidity (22.2%). During mechanical ventilation, most patients (70.4%) received between 5 and 10 cmH²O positive end-expiratory pressure. Of all the patients followed up, 44.4% died, as shown in table 1.

The results showed that the majority (55.6%) of the patients were classified in the renal injury stage by the criteria serum creatinine and urinary flow of the RIFLE classification. However, according to the criterion urinary flow, 48.2% developed renal injury and 25.9% developed risk and renal failure. The criterion serum creatinine indicated 29.6% patients with renal injury and 14.8% with kidney failure.

Table 2 shows that 40.7% of patients on mechanical ventilation with positive end-expiratory pressure between 5 and 10 cmH²O progressed to acute kidney injury and 25.9% to kidney failure. In Group 3 (positive end-expiratory pressure ≥10 cmH²O), 11.1% were classified as having acute kidney injury, and the 11.1% were classified with renal failure. The use of positive end-expiratory pressure of <5 cmH²O determined kidney injury in a lower percentage (3.7%) of patients.

Table 1. Distribution of patients according to demographic and clinical characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n(%)</th>
<th>Mean (±SD)</th>
<th>Median (25th-75th %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>27(100.0)</td>
<td>50.1±19</td>
<td>-</td>
</tr>
<tr>
<td>Male</td>
<td>16(59.3)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>BMI (kg/m²)*</td>
<td>26±9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Obese*</td>
<td>5(18.5)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Overweight*</td>
<td>11(40.7)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Use of vasoactive drugs</td>
<td>18(66.7)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Norepinephrine</td>
<td>16(59.3)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Dobutamine</td>
<td>1(3.7)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>APACHE II**</td>
<td>16.2±4.5</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Ventilation time (days)</td>
<td>11 (7-29)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Renal dysfunction (RIFLE)</td>
<td>27(100.0)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Comorbidities***</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hypertension</td>
<td>6(22.2)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Diabetes</td>
<td>3(11.1)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Heart disease</td>
<td>1(3.7)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>PEEP</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Group 1</td>
<td>1(3.7)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Group 2</td>
<td>19(70.4)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Group 3</td>
<td>7(25.9)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Deaths</td>
<td>12(44.4)</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*4 patients with data; **18 patients with data; ***One or more sets of data per patient. SD: standard deviation; BMI: body mass index; APACHE: Acute Physiology and Chronic Health Disease Classification System II; RIFLE: Risk, Injury, Failure, Loss, End-Stage; PEEP: positive end-expiratory pressure; Group 1: PEEP <5 cmH²O; Group 2: PEEP between 5 and 10 cmH²O; Group 3: PEEP ≥10 cmH²O

In this study, there was a statistically significant association between body mass index and death (p = 0.07), indicating that patients with body mass index ≥25 kg/m² were predisposed to increased mortality (p = 0.024). It was observed that patients with a body mass index ≥30 kg/m² required higher positive end-expiratory pressure (≥10 cmH²O). The association between these variables was significant (p = 0.048).

Assessing the disease severity of the patients, it was possible to associate the APACHE II index of patients followed up in the study with the incidence of renal dysfunction; it was also found that patients admitted to the intensive care unit with a median APACHE II score of 18 were classified as being in the renal failure stage, and those with a median APACHE II score of 15 were classified as being at risk of kidney damage. This association was significant (p = 0.046).
Discussion

The limitations of this study were related to the lack of records in the electronic patient files and the small sample size. This may be because of the percentage of patients with renal dysfunction prior to admission to the intensive care unit (approximately 50%-60%). This study will hopefully contribute to promoting safe healthcare practices and clinical management of severely ill patients by nurses, through their professional qualification. The presence of competent professionals can help decrease patients’ vulnerability to complications by increasing safety in the healthcare setting.\(^\text{10}\)

Awareness of the real incidence of acute kidney injury and its lethal effects in various clinical settings has increased dramatically, leading to renewed interest in the diagnosis, prevention, and treatment of this pathology. The implementation of the RIFLE classification to identify and stage acute renal dysfunction has supported the early adoption of preventive measures in clinical practice in many healthcare institutions.\(^\text{11,12}\)

Acute kidney injury is a recurring health problem in critically ill patients, and its incidence is increasing. It is estimated that 36% to 67% of patients in intensive care units develop renal dysfunction. In this study, this percentage was 100% according to the RIFLE classification. It is known that the causes are multifactorial and may be associated with various elements, such as hypovolemia, sepsis, nephrotoxins, and hemodynamic disturbances. Furthermore, scientific evidence suggests that mechanical ventilation is closely related to the development of renal dysfunction.\(^\text{12,13}\)

The literature discusses increased positive end-expiratory pressure associated with mechanical ventilation as an important risk factor for the development of renal dysfunction. A meta-analysis showed that invasive mechanical ventilation is associated with a threefold increase in the likelihood of acute kidney injury in critically ill patients. Nevertheless, in general, positive end-expiratory pressure does not appear to significantly alter the risk of acute renal failure, as shown in this study.\(^\text{4}\)

In this study, in patients on mechanical ventilation, the criterion urinary flow of the RIFLE classification had better discriminatory power to identify renal dysfunction compared with the criterion serum creatinine. It should be considered that the serum creatinine level lacks sensitivity and does not offer early, real-time assessment of the glomerular filtration rate, leading to the underestimation of the degree of renal dysfunction in critically ill patients.\(^\text{4}\)

It is known that there are differences in the disease evolution in patients who spend <5 days in intensive care units compared with those who spend ≥5 days. Hospitalization duration of ≥5 days in intensive care units, combined with mechanical ventilation and emergency surgery, increase the risk of developing serious diseases. In this study, in particular, hospitalization duration in the intensive care unit were longer (approximately 11 days), which increased the risk of patients and predisposition to complications.\(^\text{11}\)

The APACHE II score is a prognostic index used to assess the disease severity of patients admitted to intensive care units. Scientific evidence indicates that a score of >16 represents a risk factor for renal dysfunction, specifically for acute renal failure,\(^\text{14}\) which was confirmed in this study.

Body mass index is the most commonly used marker of adiposity. In the general population, very low or high body mass indices are associated with increased mortality.\(^\text{15,16}\) In severe cases, however, being underweight is an established prognostic factor for mortality, but the impact of being overweight or obese is still controversial.\(^\text{17,18}\)

Studies with body mass index data collected 10 to 30 years ago have consistently found an increased risk of mortality among people who are severely obese (body mass index ≥35 kg/m\(^2\)), overweight (25.0–29.9 kg/m\(^2\)), and obese people (30.0–34.9 kg/m\(^2\)).\(^\text{19-21}\) In this study, a statistically significant relationship was seen between body mass index and mortality (p = 0.024). Patients with body mass index values of >25 cmH\(_2\)O presented a greater risk of death, and the need for higher levels of positive end-expiratory pressure. However, the results showed that the prevalence of acute kidney injury...
increased significantly with increased body mass index. In addition, most of these patients were classified as being in the renal failure stage, with even higher percentage rates when body mass index was ≥25 kg/m². It was therefore demonstrated that the probability of developing acute renal failure in obese patients is twice that in individuals with a normal body mass index.(17)

In view of these findings, the work of a multidisciplinary team in intensive care units is essential to minimize and prevent the development of renal dysfunction, and to minimize its risk factors, given the complexity of the human body, especially when patients are hospitalized and in serious condition. In this aspect, it is essential to highlight that nurses represent the largest occupational group in the healthcare workforce, offering the utmost care, safety, and quality at all levels of care.(22)

**Acknowledgments**
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**Collaboration**
Santos LL participated in the design and execution of the project, collection and interpretation of data, and writing the article. Magro MCS contributed to the design, project planning, analysis and data interpretation stages, as well as to the writing and critical review of relevant intellectual content, and approved the final version for publication.

**Conclusion**
The use of invasive mechanical ventilation with positive end-expiratory pressure in critically ill patients can result in damage to kidney function in patients in intensive care units.

**References**

Primary care information system: potential for health promotion

Sistema de informação da atenção básica: potencialidades para a promoção da saúde

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Maria Fernanda Baeta Neves Alonso da Costa¹
Patrícia Madalena Vieira Hermida¹
Cláudia Cossentino Bruck Marçal¹
Camilla Costa Cypriano¹

Abstract
Objective: To discuss the use of the Primary Care Information System from the perspective of health promotion.
Methods: A quantitative descriptive study conducted in Family Health Units of 21 municipalities of Florianópolis. Data collection was conducted between October of 2011 and July of 2012, through interviews with health professionals, featuring the use of the Primary Care Information System.
Results: All municipalities surveyed use this information system; nineteen (90.5%) used flow sheets; while eight municipalities (38.1%) used all of the reports.
Conclusion: The data generated by this system enables the planning of health promotion actions by the teams. There needs to be discussion of the data in the meetings and reorganization of primary care activities.

Keywords
Information Systems; Primary health care; Health family; Health promotion; Health care (public health)

Resumo
Objetivo: Discutir a utilização do Sistema de informação da Atenção Básica na perspectiva da promoção da saúde.
Resultados: Todos os municípios pesquisados utilizam este Sistema de informação; dezenove (90,5%) utilizam as Fichas; enquanto oito municípios (38,1%) realizam todos os relatórios.
Conclusão: Os dados gerados por este sistema possibilitam o planejamento das ações de promoção da saúde pelas equipes. É necessário que haja discussões dos dados nas reuniões e reorganização das atividades na Atenção Básica.

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Introduction

The Brazilian Unified Health System has, as its principles, universal access, comprehensive care, popular participation, and equity. The purpose of this system is to disconnect from the model of care characterized by a concentration on medical work in the hospital and focused on treatment of diseases. The system was constructed based on the health system as a right, understanding it as a result of the living conditions of the population. For this, we propose a system guided by health promotion, prevention and treatment of diseases in different levels of care.\(^1\)

In order to improve primary care, the new National Care Policy was approved, which establishes the revision of guidelines and standards for its organization, expansion and consolidation.\(^2\)

The Family Health Program, created in 1994, and modified for the Family Health Strategy, arises as an opportunity to change the biomedical paradigm focused on pathology. Family health is guided by the principles of the Unified Health System as a way to seek consolidation of primary care and approximation of the population to healthcare services. It aims to structure the public health system, proposing to change the care model as a strategy of prioritizing prevention and health promotion, without necessarily abandoning the care service.\(^3\)

Health promotion is the process of empowering individuals and communities to act to improve their quality of life and health, including greater participation in the control of this process. Health promotion is not solely the responsibility of the health sector, and it goes beyond a healthy lifestyle, in the direction of global well-being. It also refers to a combination of actions that include the development of personal skills, reorientation of the health system, reinforcement of community action, healthy public policies and creation of supportive environments.\(^4\)

Health promotion seeks to stimulate personal and social development by providing information, health education that can contribute to the improvement of life skills. From this, there is an increase in options available to people to exercise more control over their health and environment, with favorable choices for existence. Empowering people to learn, throughout life, and prepare them for all the steps, such as how to cope with chronic disease or preparing them for external causes that affect health.\(^5\)

Given the accentuated expansion of the Family Health Strategy and the discussion of issues related to the amount of data collected by the teams, the creation of an information system that considered the complexity of the organization of primary care was required,\(^6\) as the manually collected and archived material is shown to be insufficient for the use of data collected by the professionals. This system developed by the Ministry of Health was named the Primary Care Information System.

It is believed that the lack of recognition of the importance of this system to subsidize the decision-making process has prevented the proper recognition by managers and health workers. However a greater involvement of these actors in the consolidation of the system would facilitate and qualify the planning activities in population health.\(^7\)

Changes in international paradigms of public health, exposed in various health promotion conferences, seek to have more equity to care areas, minimizing inequality; working on promotion policies at local levels. It is known that the greater the range of information available in the system, the easier, more complete and safe become the planning and development of strategies for health promotion. For the usefulness of the Primary Care Information System to be expanded and to streamline decision-making relating to promotion, the development of healthy public policies is suggested, so that they comply with the goals proposed within a viable planning, in accordance with the need for intervention of each community, respecting particular cultural, socio-economic peculiarities, beliefs, habits and customs.\(^8\)

This study aimed to discuss the use of the Primary Care Information System from the perspective of health promotion.
Methods

A descriptive research study was conducted in the Family Health Units of 21 counties that comprise the region of greater Florianópolis, except for the capital. The study sample was composed of 21 professionals responsible for the records of the Primary Care Information System of the counties, considering as an inclusion criterion the indication of the health managers and being linked to the Municipal Health Department. Professionals that were unacquainted with the information system were excluded.

The research instrument was a validated and adapted script administered in the form of an interview,⁹ in the period of October of 2011 to July of 2012. This script was composed of three components: characterization of the institution; completion of the information system of the respective records and reports; and identification of the health education group activities.

For data analysis, descriptive statistics were used by means of absolute and relative frequencies. Collected data were presented in the form of tables and discussed from the theoretical framework of the Ottawa Charter⁴ about health promotion.

The development of the study met national and international standards of ethics in research involving human subjects.

Results

The state of Santa Catarina has 6,248,436 inhabitants and 295 municipalities. The 21 counties of the metropolitan area of Florianópolis, included in this study, have a total population of 590,993 inhabitants, which corresponds to 9.46% of the state population, and consists of 146 Family Health Teams, as shown in table 1.

All of the municipalities surveyed have at least one Family Health team; São José has the largest population (3.4%) and the largest number of teams (n.37; 25.3%), while the counties of Rancho Queimado, São Bonifácio and Anitápolis are composed of smaller populations.

In table 2, it can be observed that all municipalities use the Primary Care Information System, of which 19 (90.5%) use all the forms (A, B, C and D). Regarding the reports that can be generated from this information system, only eight municipalities (38.1%) perform all reports (SSA2, SSA4, PMA2, PMA4), while 12 (57.1%), only do the PMA2 - which is the only one used in 100% of the municipalities.

Table 1. Distribution of the total population and the family health teams

<table>
<thead>
<tr>
<th>Municipalities</th>
<th>Inhabitants</th>
<th>Teams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Águas Mornas</td>
<td>5,548</td>
<td>2(1.4)</td>
</tr>
<tr>
<td>Alfredo Wagner</td>
<td>9,410</td>
<td>3(2.0)</td>
</tr>
<tr>
<td>Angelina</td>
<td>5,250</td>
<td>2(1.4)</td>
</tr>
<tr>
<td>Antípolis</td>
<td>3,214</td>
<td>1(0.7)</td>
</tr>
<tr>
<td>Antônio Carlos</td>
<td>7,458</td>
<td>3(2.0)</td>
</tr>
<tr>
<td>Biguaçu</td>
<td>58,206</td>
<td>17(11.6)</td>
</tr>
<tr>
<td>Canelinha</td>
<td>10,603</td>
<td>4(2.7)</td>
</tr>
<tr>
<td>Garopaba</td>
<td>18,138</td>
<td>6(4.1)</td>
</tr>
<tr>
<td>Governador Celso Ramos</td>
<td>12,999</td>
<td>5(3.5)</td>
</tr>
<tr>
<td>Leoberto Leal</td>
<td>3,365</td>
<td>2(1.4)</td>
</tr>
<tr>
<td>Major Gercino</td>
<td>3,279</td>
<td>1(0.7)</td>
</tr>
<tr>
<td>Nova Trento</td>
<td>12,190</td>
<td>4(2.7)</td>
</tr>
<tr>
<td>Palhoça</td>
<td>137,334</td>
<td>26(17.8)</td>
</tr>
<tr>
<td>Paulo Lopes</td>
<td>6,692</td>
<td>3(2.0)</td>
</tr>
<tr>
<td>Rancho Queimado</td>
<td>2,748</td>
<td>1(0.7)</td>
</tr>
<tr>
<td>Santo Amaro</td>
<td>19,823</td>
<td>7(4.8)</td>
</tr>
<tr>
<td>São Bonifácio</td>
<td>3,008</td>
<td>1(0.7)</td>
</tr>
<tr>
<td>São João Batista</td>
<td>26,260</td>
<td>8(5.5)</td>
</tr>
<tr>
<td>São José</td>
<td>209,804</td>
<td>37(25.3)</td>
</tr>
<tr>
<td>São Pedro Alcântara</td>
<td>4,704</td>
<td>2(1.4)</td>
</tr>
<tr>
<td>Tijucas</td>
<td>30,960</td>
<td>11(7.6)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>590,993</strong></td>
<td><strong>146(100)</strong></td>
</tr>
</tbody>
</table>


Table 2. Forms and reports of the Primary Care Information System used in the municipalities

<table>
<thead>
<tr>
<th>Forms and records</th>
<th>Municipalities</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forms A/B/C and D</td>
<td>Águas Mornas, Alfredo Wagner, Angelina, Antípolis,</td>
<td>19(90.5)</td>
</tr>
<tr>
<td></td>
<td>Antônio Carlos, Biguaçu, Canelinha, Garopaba,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Governador Celso Ramos, Leoberto Leal, Major</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gercino, Palhoça, Rancho Queimado, Santo Amaro</td>
<td></td>
</tr>
<tr>
<td></td>
<td>da Imperatriz, São Bonifácio, São João Batista,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>São José, São Pedro de Alcântara and Tijucas</td>
<td></td>
</tr>
<tr>
<td>No forms A/B/C and D</td>
<td>Nova Trento and Paulo Lopes</td>
<td>2(9.5)</td>
</tr>
<tr>
<td>SSA2, SSA4, PMA2, PMA4</td>
<td>Alfredo Wagner, Antônio Carlos, Biguaçu,</td>
<td>8(38.1)</td>
</tr>
<tr>
<td></td>
<td>Governador Celso Ramos, Leoberto Leal, Major</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gercino, Palhoça and São José</td>
<td></td>
</tr>
<tr>
<td>SSA2, PMA2</td>
<td>Garopaba</td>
<td>1(4.8)</td>
</tr>
<tr>
<td>Only PMA2</td>
<td>Águas Mornas, Angelina, Antípolis, Canelinha,</td>
<td>12(57.1)</td>
</tr>
<tr>
<td></td>
<td>Nova Trento, Paulo Lopes, Rancho Queimado, Santo</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amaro da Imperatriz, São Bonifácio, São João</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Batista, São Pedro de Alcântara and Tijucas</td>
<td></td>
</tr>
</tbody>
</table>

Source: Data collection in the 21 municipalities of region of greater Florianópolis, 2012.
do (n.9; 42.9%), eight (38.1%) direct these activities for groups of hypertensive and diabetic patients. Participants receive guidance about the disease, the medications, and the monitoring by the Family Health Team. Activities are also conducted with groups of seniors, smokers, walkers, painting and patchwork, as well as school health groups, which are linked to the School Health Program of the federal government. In this study, it was identified that the nurse is invited by the School Board to develop health education activities according to the needs of students.

### Table 3. Health education activities developed in group

<table>
<thead>
<tr>
<th>Health education groups</th>
<th>Municipalities</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertensives and diabetics</td>
<td>Águas Mornas, Angelina, Antonio Carlos, Biguaçu, Governador Celso Ramos, Rancho Queimado, Santo Amaro e São Bonifácio</td>
<td>08(38.1)</td>
</tr>
<tr>
<td>Seniors</td>
<td>Angelina e Antonio Carlos</td>
<td>02(9.5)</td>
</tr>
<tr>
<td>Smokers</td>
<td>Antonio Carlos</td>
<td>01(4.7)</td>
</tr>
<tr>
<td>Walking, painting and patchwork</td>
<td>Biguaçu</td>
<td>01(4.7)</td>
</tr>
<tr>
<td>School health</td>
<td>Águas Mornas e Alfredo Wagner</td>
<td>02(9.5)</td>
</tr>
<tr>
<td>No groups</td>
<td>Anitápolis, Canelinha, Garopaba, Leoberto, Leal, Major Gercino, Nova Trento, Paihoça, Paulo Lopes, São João Batista, São José, São Pedro de Alcântara e Tijucas</td>
<td>12(57.1)</td>
</tr>
</tbody>
</table>

Source: Data collection in the 21 municipalities of the region of greater Florianópolis, 2012.

**Discussion**

The study was limited to discuss the use of the Primary Care Information System in a quantitative approach. Therefore, it is necessary to expand the understanding of the use of this system, from different methodological foci and new sample groups.

The information produced on the implementation of the Primary Care Information System can contribute to the characterization and reorganization of the health services offered to the population of the municipalities of greater Florianópolis, according to the health needs. This system has the potential to contribute to the improvement of quality of life and to diminish inequities in the population, depending on the effort of many actors to develop health promotion practices.

The Primary Care Information System produces reports that help the teams themselves that, linked to municipal managers, monitor the work and assess its quality. In this study, one can see that the Family Health teams use this system, whose data can be used for the analysis of social reality, planning and organization of health promotion activities.

However, it is emphasized that for the actions to be solidified, the data need to be consolidated, related, analyzed and discussed in the local and municipal environment. Thus, the Primary Care Information System provides subsidies to evaluate the developed activities, permits adoption of appropriate behaviors, and even raises difficulties of the teams, it is characterized as a guiding instrument of team work that should be used to achieve the proposed objectives and agreed goals.\(^{(10)}\)

For the development of health promotion strategies to occur, professionals need the understanding of this issue, since, in the majority of cases, they confuse the concept of health promotion with that of disease prevention.\(^{(10)}\) We emphasize the importance of health promotion strategies to overcome the health determinants that affect the process of living and becoming ill. The health promotion activities such as educational activities can be directed to certain groups, such as those with chronic diseases, the elderly, adolescents and children. The adoption of healthy lifestyles capable of providing longevity of individuals, through the educational approach, should be reinforced, but, as observed in this study, it often occurs in a preventive manner with a methodological approach of unidirectional transmission of knowledge, whose the focus is not on health promotion.\(^{(11)}\)

The data records in the Health Information Systems generally fulfill an obligatory bureaucratic function, although these data demonstrate the need for educational actions of promotion aimed at reducing the health inequities. Health teams, in their daily practice, should adopt health-promoting actions at the local and municipal levels, as the social and health reality involves multiple factors and are important processes to work with the individual, family and community.\(^{(12)}\) These factors are related to many global health problems, including the economic crisis, climate change and a wide range of health threats. There are new challenges and opportunities to redesign, reposition and renew efforts to strengthen health promotion and its role in reorientation of health services.\(^{(13)}\)
It is noteworthy also that the majority of health promotion activities, when performed by Family Health Teams, have little to do with the statistics produced by the system. These activities serve more to charge the productivity of the professionals, than to be an instrument that contributes to the development of health promotion actions. On the other hand, the Health Information Systems provide knowledge of health status, sociocultural and economic situation, but still require subjective data, such as lifestyles, risk situations, unemployment, income and others that are important elements that can contribute to the organization of health promotion actions.

Health Information Systems offer data of the situational analysis so that health planning occurs according to the reality and needs of each community, decentralized and regionalized, aimed at the production of quality of life. We highlight the organization of actions of the teams, with a focus on community participation, social control, and educational and health promotion activities.\(^\text{(14)}\)

In Catalonia (Spain) the health information networks are integrated, there is an electronic medical record that shares clinical information that is accessible from any health system, either primary care or the hospital.\(^\text{(14)}\) The development of an information system is an essential tool for improving primary care in Spain.\(^\text{(15)}\)

In the Primary Care Information System, there are forms used (A, B, C and D) and reports (SSA2, SSA4, PMA2 and PMA4) that, once completed, allow the organization and maintenance of data collected by the Family Health team professionals about the care and procedures provided, as well as in relationship to the enrolled population. These recording instruments are used in municipalities investigated, according to table 2.

It is noteworthy that the completion of the forms of this system is one of many difficulties encountered by the staff in the working model of the Family Health Strategy of 31 municipalities of the state of Rio Grande do Sul, according to research about the need for education and training of professionals.\(^\text{(7)}\)

Form A is completed by the Community Health Agent in the home visits for the registration of the families. It enables awareness of the total number of people followed by the team, their age, sex, education level, occupation and the referred diseases. In addition, the housing conditions are recorded: type of house, garbage destination, mode of treatment and supply of water at home, and fecal and urinary destination.\(^\text{(16)}\) The use of this record was also demonstrated in this study, when 90.5% of the municipalities demonstrated its implementation, as shown in table 2.

Form B is for monitoring of priority groups: pregnant women; hypertensives; diabetics; patients with tuberculosis and leprosy. The users belonging to such groups must have systematic monitoring by the Family Health Team and are visited monthly. Form B-GES (Pregnant) permits knowledge of the pregnant women in each coverage area, the application of tetanus vaccine, nutritional status, prenatal consultations and exposure to risk factors. It is the Community Health Agent, through the form B-HAS (Hypertension), who informs the team about hypertensive patients that follow the recommended diet, the use of medication, and the practice of physical exercise. Such information allows for the identification, for example, about the adherence to medication and non-medication therapy. The form B-DIA (Diabetes) includes the same data of form B-HAS, added to the patient information on the use of oral hypoglycemic agents and insulin.\(^\text{(16)}\)

The monitoring of patients with tuberculosis occurs through form B-TB (Tuberculosis), with the objective of verifying the use of medication, sputum collection, and the contacts. This information also constitutes the monitoring record of users who have leprosy (Form B-HAN), adding data on self-care performance for the prevention of disabilities.\(^\text{(16)}\)

A study on the use of forms of the Primary Care Information System by professionals revealed that, even for the higher incidence diseases (hypertension and diabetes) or priority monitoring conditions (pregnant women), many times form B (B-HAS; B-DIA; B-GES) was not used by the team\(^\text{(16)}\). It is highlighted in this study that only two municipali-
ties (9.5%) studied did not use Form B in the work process of the Family Health teams, as noted in table 2.

Form C (Child Card) permits one to identify the profile of children registered in each area, to identify birth weight, height, head circumference, 5’ Apgar, and type of delivery. The measurement of anthropometric data (weight and height) monthly enables the team to monitor child development and adopt relevant measures, if needed.\(^\text{(16)}\)

In form D, the daily record of activities is performed, procedures and notifications developed by professionals. With the completion of this form the team collects productivity data, types of consultations, medical referrals, procedures performed and notifiable diseases.\(^\text{(16)}\)

An analysis of scientific literature about the Primary Care Information System and its use by the Family Health team pointed out that the difficulties related to the system are in the interpretation, content and number of files, in addition to difficulties related to professional qualification and practice in the use of data to guide actions.\(^\text{(17)}\)

Accordingly, we call attention to the system as the source of the record and data storage, since the main concern of the teams is on completing the daily work forms and not on the analysis of the information that it is able to produce for the realization of the local programming. Therefore, limited to the record, this information system is not used as a basic management tool for planning and evaluation of the promotion, prevention and health rehabilitation activities and the transformation of the local situation,\(^\text{(8)}\) a reality that needs to be discussed with the objective of improving the health of the population.

In relationship to the PMA2 report, it is completed monthly by a higher level professional, in general nurses, who collect the form D from the entire team; this instrument consolidates productivity activities and procedures performed by area, forwards a copy to the Municipal Health Department, and retains one copy in the unit, for discussion at the monthly staff meeting, as shown in table 2.

Among the productivity activities provided in the PMA2 report are the medical appointments, the type of medical and nursing care, laboratory exams, medical referrals and home care. In relationship to the procedures, the total of these that is performed by the health team (sanitary inspection visit, individual care by higher level professional, dressings, sutures, inhalations, injections, removal of stitches, oral rehydration therapy, attending health education groups and meetings), except medical consultations.\(^\text{(16)}\)

The PMA4 report that, according to this study, is performed in only eight (38.1%) municipalities (Table 2), is intended for the monthly consolidation of the PMA2 report data, aggregating the information concerning to the production of services and the occurrence of diseases and/or situations considered as markers, by the municipality.\(^\text{(16)}\)

With regard to the SSA2 report, conducted by nine (42.8%) of the municipalities of this research, according to Table 2, it consolidates information about the health status of families monitored in each area. The data for its completion are derived from Forms A, B, C and D and refer to micro-areas of a given area. There is also the SSA4 Report, used in eight (38.1%) municipalities with the objective of consolidating the data on the areas of the same municipality, by model of care (PACS or PSF) and zone (urban or rural).\(^\text{(16)}\)

Authors recognize that the Health Information System has flaws inherent in both the software and in how to operationalize it, but point out that it is critical to point to the possibilities for its use. Reports and productivity tables, generated by the system, provide results for the development of population-based diagnosis, which should be used in the organization of Family Health, in the actions of each professional in the context of teamwork and service management. However, research conducted by the authors pointed out that the team chooses other instruments than those produced by this information system to guide the planning of its actions.\(^\text{(18)}\) Many of the records in the system contain repetitive questions that distort the collected data and, consequently, the teams tend to analyze only the data related to certain diseases, basic sanitation and hygiene practices.\(^\text{(19)}\)
Despite the difficulties described regarding the Health Information System, it should be a fundamental database in Primary Health Care.\(^{(18)}\)

The Family Health Strategy has as its central role an educational practice aimed at health promotion. The use of the Primary Care Information System as an instrument of work of the teams has significant data that enable the targeting of the work process and health education activities. However, more than half of the investigated municipalities did not perform health education activities in groups.

The educational groups aim to promote opportunities for interaction and learning, which represents an advance in relationship to the classical perspective of the teams in taking groups as spaces for passing of information and prescribing measures for healthy living. They can be understood as powerful collective care environments, which favor group discussions and a change in practice: from the perspective of only informing and reproducing to the perspective of producing integrated care.\(^{(12)}\)

The conception that the health professional has of promoting health, influences his/her practice and is impacted through his/her actions to meet the broader concept of health promotion as quality of life, directing the work of nurses in order to develop an enhanced vision of the socioeconomic and cultural context of the population, but also to know, understand and consider the social determinants of health as indicators that expand or reduce the vulnerabilities of population groups.\(^{(20)}\)

One study\(^{(21)}\) revealed health promotion contemplated in groups of individuals with arterial hypertension overcoming the healing vision focused on medicalization and they perceived advances in the understanding of these users, about their health-disease process, who opted for new possibilities of being healthy, such as leisure options, healthy eating and physical activity opportunities that contributed to their quality of life.

It showed the incorporation of health promotion actions far from the concrete practice of the professionals, which is based on an individual and curative biomedical model. It is important that health professionals understand that promotion involves various intervention strategies, operating from the clinic to the context of social and political determinants of the health-disease process that can stimulate the empowerment of multiple social actors.\(^{(21)}\) In addition, health professionals need to reflect on the increasing technical complexity needed to plan, implement and evaluate health promotion activities. Professionals must have skills to interpret and synthesize data and health information and to operate in complex organizational structures.\(^{(22)}\)

## Conclusion

The use of the Primary Care Information System should move beyond the prevention of disease to health promotion. From this perspective, form A, which includes the living conditions and health of individuals and families, enables a diagnosis and organizing of health practices, depending on the view of the professional. It also points to the use of form D, as a potential for the development of health promotion activities, however, for this to happen, professionals need to understand the concept of promotion. The realization of the reports in the municipalities participating in this study enables us to infer that the consolidated data are not used by all municipalities to plan health promotion practices in their territories.

## Acknowledgements

Article linked to the research, “Possibilities and limits for the implementation of health promotion policy in primary care: survey of problems issues” conducted by Universal edict of the Conselho Nacional de Tecnologia e Pesquisa – CNPQ National Council for Research and Technology process No. 475103 / 2011-4, coordinated by Prof. Dr. Ivonete Teresinha Schütler Buss Heidemann.

## Collaborations

Heidemann ITSB states that she contributed to the design of the research, analysis and interpretation of data, critical review of the article and approval of the version to be published. Costa MFBNA cooperated with the collection, analysis and interpretation of data, writing and critical review of the article.
Hermida PMV; Marcal CCB and Cypriano CC state they collaborated with the analysis and interpretation of data, writing and critical review of the article.

References

Equipment contamination in an intensive care unit
Contaminação de equipamentos em unidade de terapia intensiva

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Márcia Maria Carneiro Oliveira²
Josicélia Dumêt Fernandes³
Cláudia Silva Marinho Antunes Barros¹
Lívia Magalhães Costa Castro³

Abstract
Objective: To assess the contamination of equipment in an intensive care unit before and after the cleaning/disinfection routine.
Methods: The researchers used 26 sterile swabs, moistened in 0.9% saline solution, rolled in their own axis, before and immediately after cleaning/disinfection, on surfaces of collectively handled equipment in an intensive care unit, for laboratory culture.
Results: In pre-disinfection, all computer keyboards presented growth of coagulase-negative Staphylococcus; Staphylococcus hominis was found on the workbench of drug preparation and in the electrocardiogram machine; and Staphylococcus haemolyticus was found on the telephone and on the service schedule chart. The keyboards remained contaminated after being cleaned. The bench also presented Pseudomonas aeruginosa after the use of a multi-purpose cleaning product. Pieces of equipment disinfected with 70% alcohol did not present bacterial growth.
Conclusion: The contamination of equipment in the studied intensive care unit was confirmed, as well as the efficacy of 70% alcohol in its disinfection.

Resumo
Objetivo: Analisar a contaminação de equipamentos em uma unidade de terapia intensiva antes e após a rotina de limpeza/desinfecção.
Métodos: Foram utilizados 26 swabs estéreis umedecidos com soro fisiológico 0,9%, rolados em seu próprio eixo, antes e imediatamente depois da limpeza/desinfecção, sobre superfícies de equipamentos de manipulação coletiva em uma unidade de terapia intensiva, para realização de cultura laboratorial.
Resultados: Na pré-desinfecção, todos os teclados de computadores apresentaram crescimento de Staphylococcus coagulase negativo; no painel de preparo de medicamento e no aparelho de eletrocardiograma foi encontrado Staphylococcus hominis; no telefone e na escala de serviço foi encontrado Staphylococcus haemolyticus. Os teclados continuaram contaminados após limpeza. Na bancada também foi encontrado Pseudomonas aeruginosa após uso de limpador multiuso. Nos equipamentos desinfetados com álcool 70% não houve crescimento bacteriano.
Conclusão: A contaminação de equipamentos na unidade de terapia intensiva foi comprovada, assim como a eficiência do álcool a 70% na desinfecção.
Introduction

Surfaces of equipment in intensive care units are potential sources of infection and vehicles of contamination for both the health team and patients. A study conducted in American hospitals for acute care showed that, every day, approximately one out of 25 patients have at least one healthcare-associated infection.\(^1\)\(^-\)\(^3\)

Intensive care units deserve special attention as for the rigor in the cleaning and disinfection of equipment and their physical structure, which favor the dissemination of pathogens, added to the unfavorable clinical condition of patients, with greater risk of acquiring infections, aggravated by the use of mechanical ventilation, vesical catheters and intravenous devices.\(^4\)

In this context and in the light of varied sources of bacterial transmission and infection, pieces of equipment that are not used in invasive procedures, and which are collectively and repeatedly handled by the team providing care to critical patients in the intensive care unit are potential reservoirs of pathogenic agents, which may survive or persist on their surfaces for months, besides being a continuous source of transmission if regular disinfection is not performed in these pieces of equipment, such as telephones, workbenches for the preparation of medications, computer keyboards, glucometers, electrocardiogram machines, health personnel schedule charts and medical records.\(^5\)\(^,\)\(^6\)

The general objective of this study was to analyze the contamination of equipment in an intensive care unit before and after the cleaning/disinfection routine.

Methods

This study was conducted in the intensive care unit of a medium sized hospital, located in the city of Salvador, state of Bahia, northeast region of Brazil. The research considered the surfaces of 12 pieces of equipment which are routinely and collectively handled by professionals from this service. A total of 26 swabs were used, distributed as follows: two telephones (four swabs), a workbench for preparing drugs (two swabs), six computer keyboards (12 swabs), a glucometer (two swabs), an electrocardiogram machine (two swabs) and the nursing personnel schedule chart (two swabs).

Data were collected by the researchers in a single moment, as well as two swabs from each piece of equipment: one before applying the cleaning/disinfection product and another one right after the equipment was dried, without a pre-established waiting time. Each swab was identified with the moment they were collected and the types of equipment with more than one item were numbered.

The researchers used sterile swabs, which were moistened in 0.9% saline solution and rolled in their own axis on the examined surfaces, before and after cleaning/disinfection.

The cleaning/disinfection procedure followed the pattern of directly applying the product, without previously washing it with water and soap, in a single direction, and repeating it several times until the apparent dirt was cleaned. In average, at least three consecutive movements were observed, without waiting for each movement to dry.

The analyzed pieces of equipment were submitted to a cleaning/disinfection routine, more than once a day, performed by a cleaning worker, who used a rubber glove for all objects; standard cleaning cloth soaked in 70% alcohol, being one for each type of equipment; multi-purpose cleaning product; and a brush for removing dust.

There was no cleaning/disinfection routine for the glucometer and the personnel schedule chart. Computer keyboards were cleaned on a daily basis with a brush for removing dust. The electrocardiogram machine was disinfected with 70% alcohol after every use. A multi-purpose product made of dodecanol, ether, sodium sulfate and solvent was used on the workbench of medications. Telephones were disinfected with 70% alcohol.
After collections, the swabs were sent to the laboratory for automatized culture. Samples were seeded on petri plates in MacConkey and blood agar culture medium, and incubated in autoclave at 37 °C for 24 hours. Results were issued in five working days.

The development of this study complied with national and international ethical guidelines for research.

Results

The microorganisms found in the equipment, before and after the use of cleaning/disinfection procedures, are presented in chart 1 with the identification of the location where they were found and the professionals who handled the equipment.

Of the 12 surfaces analyzed before cleaning/disinfection, one did not present bacteria (glucometer) and 11 presented bacterial growth, six being contaminated with non-specified coagulase-negative *Staphylococcus* (five keyboards and one telephone), one with *Staphylococcus epidermidis* (computer keyboard), two with *Staphylococcus haemolyticus* (one telephone and one service schedule chart) and two with *Staphylococcus hominis* (an electrocardiogram machine and a workbench for preparing drugs).

After cleaning/disinfection of these surfaces, seven presented bacterial growth, six being contaminated with non-specified coagulase-negative *Staphylococcus* (computer keyboards which were submitted only to dust removal with a brush). On the workbench for preparing drugs, which was disinfected with the multi-purpose product, *S. hominis* was eliminated but there was a post-cleaning/disinfection contamination with *Pseudomonas aeruginosa*.

These findings regarding the workbench for preparing drugs led to the belief that it was necessary to repeat the collection on this surface for confirming the results. Three more swabs were used, two being from the workbench, before and after disinfection with 70% alcohol, and one from the multi-purpose product (dodecanol, ether, sodium sulfate and solvent) used to disinfect the workbench. These samples were processed with the same laboratorial technique and the data were confirmed.

There was an absence of bacterial growth in the glucometer, which was significantly handled by all professionals and but which was not submitted to the cleaning/disinfection routine at the moment of collection, since it was being used at that time.

The surfaces of telephones, the electrocardiogram machine and the service schedule chart, which were contaminated before, did not present bacterial growth after cleaning/disinfection with 70% alcohol.

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**Chart 1.** Microorganisms present in the intensive care unit (ICU) equipment, before and after cleaning/disinfection

<table>
<thead>
<tr>
<th>Equipment/number of items</th>
<th>Equipment location</th>
<th>Professionals who handle it</th>
<th>Bacteria found before cleaning/ disinfection</th>
<th>Procedure used for cleaning/ disinfection</th>
<th>Bacteria found after cleaning/ disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer keyboard /1</td>
<td>Intensive care unit center</td>
<td>Multiprofessional team</td>
<td><em>Staphylococcus epidermidis</em></td>
<td>Dust removal with a brush</td>
<td>Non-specified coagulase-negative <em>Staphylococcus</em></td>
</tr>
<tr>
<td>Computer keyboard / 2, 3 and 4</td>
<td>Intensive care unit center</td>
<td>Multiprofessional team</td>
<td>Non-specified coagulase-negative <em>Staphylococcus</em></td>
<td>Dust removal with a brush</td>
<td>Non-specified coagulase-negative <em>Staphylococcus</em></td>
</tr>
<tr>
<td>Computer keyboard / 5 and 6</td>
<td>Physicians’ office</td>
<td>Physicians</td>
<td>Non-specified coagulase-negative <em>Staphylococcus</em></td>
<td>Dust removal with a brush</td>
<td>Non-specified coagulase-negative <em>Staphylococcus</em></td>
</tr>
<tr>
<td>Telephone / 1</td>
<td>Nursing center</td>
<td>Multiprofessional team</td>
<td><em>Staphylococcus haemolyticus</em></td>
<td>Use of 70% alcohol</td>
<td>Absence of bacterial growth</td>
</tr>
<tr>
<td>Telephone / 22</td>
<td>Administrative center</td>
<td>Administrative technician</td>
<td>Non-specified coagulase-negative <em>Staphylococcus</em></td>
<td>Use of 70% alcohol</td>
<td>Absence of bacterial growth</td>
</tr>
<tr>
<td>Glucometer</td>
<td>Mobile</td>
<td>Nursing team</td>
<td>Absence of bacterial growth</td>
<td>Use of 70% alcohol</td>
<td>Absence of bacterial growth</td>
</tr>
<tr>
<td>Electrocardiogram machine</td>
<td>Mobile</td>
<td>Nursing team</td>
<td><em>Staphylococcus hominis</em></td>
<td>Use of 70% alcohol</td>
<td>Absence of bacterial growth</td>
</tr>
<tr>
<td>Workbench for preparing medications</td>
<td>Intensive care unit main center</td>
<td>Nursing team</td>
<td><em>Staphylococcus hominis</em></td>
<td>Use of a multi-purpose product made of dodecanol, ether, sodium sulfate and solvent</td>
<td><em>Pseudomonas aeruginosa</em></td>
</tr>
<tr>
<td>Service schedule chart</td>
<td>Mobile</td>
<td>Nursing team</td>
<td><em>Staphylococcus haemolyticus</em></td>
<td>Use of 70% alcohol</td>
<td>Absence of bacterial growth</td>
</tr>
</tbody>
</table>

*It was not possible to specify some coagulase-negative *Staphylococcus* through the used laboratorial technique.*
Discussion

The limitations of this study are related to the small sample size, the restricted period of collection and the lack of more specific molecular data regarding coagulase-negative *Staphylococci* (for a better comparison of the results), besides the poor resources available for the use of swabs and the development of laboratorial cultures.

The applicability of this study was verified in the scope of the studied hospital, with immediate changes in the routine of the procedures for cleaning/disinfecting equipment surfaces, in a more comprehensive manner for the several sectors of patient care and with the training of the cleaning personnel. Moreover, it allowed to provide more knowledge and to alert the authorities of the hospital organization and the professionals who worked in the intensive care unit as for the importance of properly cleaning and disinfecting equipment handled by the professionals, as well as the hygiene of their hands, before and after any contact with patients or with pieces of equipment, so as to control hospital infections.

The equipment analyzed in this study are commonly present in the intensive care unit and serve as support to the working process of the care and administrative teams, being frequently used in the delivery of care to patients. Coagulase-negative *Staphylococcus* bacteria belonging to the *epidermidis*, *haemolyticus* and *hominis* species were found in these pieces of equipment before cleaning/disinfection. These bacteria may be disseminated from the hands of professionals to patients, to other pieces of equipment and to other hospital environments, constantly, due to the high frequency in which they are used and the flow of these professionals.

*S. hominis* and *S. haemolyticus* were present before cleaning/disinfection on the electrocardiogram machine, on the workbench for preparing drugs, on a telephone located in the nursing center and on the service schedule chart, which are only handled by the nursing team. It is worth highlighting the presence of these bacteria, as studies indicate they are part of the normal flora of the human skin and the bacteria that are most commonly present in the infections of patients hospitalized in intensive care units, who are normally more frail due to their low immunity, the use of invasive devices which lead to a greater exposure to contaminations and due to their susceptibility to nosocomial bacteremia in several sites of the organism. The presence of the *S. haemolyticus* species in the equipment was a reason for concern, since it is responsible for several complications, such as endocarditis, sepsis, peritonitis, urinary tract infections, osteoarticular infections and surgical wound infections, as evidenced by other studies.\(^8\)\(^-\)\(^10\)

Hence, despite being pieces of equipment that are not directly used in the care of patients, such as telephones, workbenches and computers, the surfaces on which these pathogens were found constituted potential sources that can colonize and infect patients through the hands of professionals.

Special attention is recommended to hospital computer keyboards, as these are frequently and collectively used by professionals during the entire period of delivery of intensive care. Recommendations to make the dissemination of bacteria difficult include the use of a transparent cover on keyboards, made of a material that is resistant to the products used in periodical disinfection; the use of gloves when typing; hands hygiene; and the establishment of computer use policies by the Committee of Hospital Infection Control.\(^11\)

Regarding the contamination of the two telephones from the nursing and the administrative center, *S. haemolyticus* was found. Telephones were another source with a high potential for contamination, as they are collectively and frequently used, mainly by the nursing team, which performs most of the therapeutic procedures. A study with 100 mobile telephones revealed that all devices presented a mean bacteria count of 9.915x10^7 cfu/mL, with a total of 11 pathogenic bacteria from the *Pseudomonas* group isolated, representing, thus, potential sources of contamination and demanding the application of appropriate hygiene measures as a preventive method.\(^12\)

The nursing personnel schedule chart, which is frequently handled by the team, also presented
S. haemolyticus. As observed, paper can be contaminated by bacteria and serve as a vehicle for cross contamination of bacteria in healthcare environments, especially if the recommendations on hands hygiene are not carefully followed. Bacteria can survive 72 hours and still be cultivable after seven days. It is worth noting that, in studies with test organisms, these were transferred to paper, survived and could be retransferred back to the hands.\(^{13}\)

The glucometer of collective use for all patients did not present bacteria, however, it is not viable to state that such material cannot be colonized, since it is used near patients’ beds. In this matter, a further study, with a greater number of samples, is recommended.

A multi-purpose product (dodecanol, ether, sodium sulfate and solvent) was used on the workbench for preparing drugs, eliminating the S. hominis bacterium, present in the culture before disinfection, however, after using the product, the equipment presented P. aeruginosa, a Gram-negative bacterium that is commonly found in the skin and in mucous membranes, and spreads through direct contact, representing a high risk of infection for immunosuppressed patients. An additional culture was performed in this product, but the presence of bacteria was not identified. Hence, other possibilities of contamination cannot be ignored, such as the cloth or the gloves used in the process.

The use of 70% alcohol to disinfect the surfaces of the equipment analyzed in this study was effective and eliminated the existing bacteria immediately after its use, even without a previous cleaning procedure with water and soap. Other studies point to the efficacy of 70% alcohol in the disinfection of stethoscopes, telephones and computer keyboards.\(^{14}\) It is important to highlight that alcohols are organic chemical compounds used as bacterial agents in antisepsis procedures and to disinfect materials or surfaces in health organizations, with an antimicrobial action through the denaturation of proteins and presenting a bactericidal, anti-fungal, virucidal and tuberculocidal effect, despite not being sporocidal. The aqueous solution of alcohol is more effective in relation to the absolute alcohol, as it promotes the reduction of the superficial tension of the bacterial cell, with the 70% alcohol being more indicated, since it is hydrated and eliminates gram-negative and gram-positive bacteria in 10 seconds, and lipid and non-lipid viruses, as well as mycobacteria, in 30 seconds. In addition, 70% alcohol is indicated for intermediate- and low-level disinfection, and friction for 30 seconds is recommended once the surface has been previously submitted to a cleaning procedure.\(^{15}\)

It is worth highlighting that the adequate control of hospital infections also depends on strategies of actions that promote compliance with evidence-based practice, education and investments in measures to improve knowledge, the development of basic epidemiological research, and the continuous assessment of the improvements implemented. Several studies confirmed that determining factors for infections arise from the normal microbiota and the interaction of patients with the environment where they are, from which the authors highlighted the equipment used in the health care provided in intensive care units. The conditions of the patient and those of the environment, as well as the inadequacy of the cleaning/disinfection processes lead to the development of infections in several sites, and it is proved that the adequate hygiene of the hospital environment and the hands of professionals contribute, decisively, to prevent hospital infections.\(^{16,17}\)

**Conclusion**

The contamination of equipment in the studied intensive care unit was confirmed, as well as the efficacy of 70% alcohol in its disinfection.

**Collaborations**

Cordeiro ALAO; Oliveira MMC; Fernandes JD; Barros CSMA and Castro LMC contributed with the conception and development of the research, data collection and analysis, writing of the article and review of the final version to be published.
References


Prevalence of sedentary lifestyle among adolescents
Prevalência de estilo de vida sedentário entre adolescentes

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Abstract
Objective: To identify the prevalence of sedentary lifestyle among adolescents and to know the correlation between the results obtained by two standardized measurement instruments.

Methods: Descriptive, cross-sectional study, which evaluated 132 students aged between 14-18 years. Study variables were: gender, age, physical activity levels with the use of the international physical activity questionnaire in its short version, and average daily steps using the pedometer for at least 4 consecutive days.

Results: The prevalence of sedentarism assessed by questionnaire was 19.7% and the prevalence identified by the pedometer was 8.3% (p=0.021). No correlation was identified between the results from instruments. The correlation between the methods was weak (k=0.021).

Conclusion: The prevalence of sedentarism was lower when assessed by pedometer and there was no correlation with the results of the evaluation by questionnaire. The correlation was weak between the two measuring instruments.

Keywords
Adolescent; Sedentary lifestyle; Primary care nursing; Community health nursing; Prevalence

Resumo
Objetivo: Identificar a prevalência de estilo de vida sedentário entre adolescentes e conhecer a concordância entre os resultados obtidos por dois instrumentos padronizados de medida.

Métodos: Estudo descritivo, transversal, que avaliou 132 estudantes de 14 a 18 anos. As variáveis de estudo foram: sexo, idade, níveis de atividade física com a utilização do Questionário Internacional de Atividade Física em sua versão curta, e média diária de passos com a utilização do pedômetro por, no mínimo, 4 dias consecutivos.

Resultados: A prevalência de sedentarismo avaliada pelo questionário foi de 19,7% e a identificada pelo pedômetro foi de 8,3% (p=0.021). Não foi identificada correlação entre os resultados dos diferentes instrumentos. A concordância entre os métodos foi fraca (k=0.021).

Conclusão: A prevalência do sedentarismo foi menor quando avaliada pelo pedômetro e não houve correlação com os resultados da avaliação pelo questionário. A concordância foi fraca entre os dois instrumentos de medida.

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Introduction

Sedentarism, recognized as the lack of physical activity is a risk factor for many diseases, such as obesity, hypertension, cardiovascular diseases and diabetes mellitus. The lifestyle of the population in recent decades has contributed to the sedentary lifestyle. The daily life imposes less and less physical activity. The means of transport are increasingly efficient, being preferred to the detriment of walking or other means involving energy expenditure. In addition, the activities carried out in leisure time are usually those that consume less body energy.

Adolescence is a great period to the development of healthy habits, which may resonate into adulthood. The knowledge of the level of physical activity in adolescents is critical to plan effective measures against sedentarism. It is important for nurses and other professionals who deal with adolescent health tools that they quantify the amount of physical activity practiced, identifying sedentary practices.

As health indicators of a population may be measured by the presence of disease, in the evaluation of the sedentary lifestyle the measure regards the level of physical activity, which can be obtained directly (heart rate, physiological markers, calorimetry and motion sensors) or indirectly (using questionnaires, diaries and interviews).

The parameters used for the evaluation of sedentarism are often arbitrary and not applicable in all segments of the population. Among adolescents, validated instruments that can be applied are scarce.

Among the existing indirect methods to evaluate sedentarism there is the short version of the international physical activity questionnaire (IPAQ), which assesses the level of physical activity through the duration and the frequency of walking, moderate and vigorous activities reported by the individual referring to the last week. The IPAQ short version was validated for adolescents aged from 14-18 years old in Brazil.

Another method that has been used for the assessment of physical activity is the count of daily steps. For this measurement, the equipment used in some studies with different populations has been the pedometer. This is a small device that has a body motion sensor in pendulum, which measures the amount of steps taken by the individual for the period of 1 day. It has been used for being practical, easy to handle and affordable price, in addition to provide objective measure of the amount of the individual steps in the day.

However, the use of this equipment has not yet been validated among adolescents and there is no definition of specific cut-off points that characterize the presence of sedentary practices in this population. There are cut-off points for definition of sedentary lifestyle with counting steps per day only among adults. Studies that used the measure of steps among adolescents have adopted the same cut-off points used to define the level of physical activity among healthy adults: <5,000 sedentary; 5,000-7,499 low active; 7,500-9,999 somewhat active; 10,000-12,499 active; and > 12,500 highly active.

The question is whether the assessment of sedentary performance with the application of validated questionnaire such as the IPAQ may be replaced by another method, such as counting steps by pedometer.

The objectives of this study were: to identify the prevalence of sedentary lifestyle among adolescents and to know the correlation between the results obtained for two standardized measuring instruments.

Methods

Descriptive, cross-sectional study that evaluated students aged from 14-18 years old of state public schools of the eastern region of Goiania, capital of Goiás State. The sample was calculated using the formula for comparing two proportions. For the calculation, we considered the proportion of sedentary adolescents measured by IPAQ, 62.5% according to a level of significance of 5.0%, effect size of 0.8 and power of test of 80.0% The calculation of the sample resulted in 124 participants. Data were collected from 132 adolescents, equaling to 106.5% of sample calculated.
Managers of 11 schools in the region were contacted, informed and after agreement, four schools were included, who have agreed to participate in the research. It was requested from the coordination from each school selected the list of classes with students in the aimed age group. From that list, we drafted the rooms that composed our sample. Study variables were: gender, age, physical activity levels using IPAQ short version and average daily steps according to the pedometer. The IPAQ was applied under the supervision of researchers and their own teens recorded their answers. The pedometer OM-RON®, model HJ-105INT was used, with capacity for 100 thousand step count and memory for seven days, being used for a week. The adolescents were told to put the pedometer when they got up and pull it off only to sleep, bathe or when performing some activity in the water. The device was placed at the waist, pinned to the clothes, in order to have contact with the body. For the calculation of the average number of steps per day, we used the pedometers that presented records of four consecutive days or more.

We considered as sedentary, by IPAQ use, the adolescent who presented less than 300 minutes of physical activity per week. As there are no validated cut-off points for the pedometer use among adolescents, a cut-off point has been established through assessing the sensitivity and specificity of both instruments, whereas the IPAQ as gold standard, since this has been validated for use with this population. We defined in the ROC curve, the point of 4,012 steps per day, in which the assessment of both instruments reached highest levels. That was the cut-off point used in this study for the comparison and correlation analyses.

The prevalence of sedentarism, evaluated by the IPAQ and the pedometer was calculated in absolute values and percentages. For the identification of difference between the number of sedentary assessed by two methods was used Descartes rule of signs. Kappa coefficient (k) was applied for the study of agreement between the results obtained by the use of two instruments. Kappa coefficient was interpreted considering weak agreement if <0.40, moderate 0.40-0.75, and good if >0.75. The study of correlation between instruments of assessment was performed by linear regression analysis. It was considered as significant p-value <0.05. Data were analyzed with Statistical Package for the Social Sciences (SPSS) version 15.0.

The development of study attended national and international standards of ethics in research involving humans and animals.

### Results

A total of 132 adolescents were evaluated, 53.0% (n=70) females (p=0.486). The average age was 15±1.2 years (minimum 14; maximum 18 years). Regarding age range, 44.7% (n=59) had less than 15 years (p=0.223).

Average steps per day, identified by the pedometer was 9,837 (±4,918) (minimum 1,165; maximum 30,752).

The average time spent in physical activity measured by IPAQ was 797.8 (± 567.7) minutes per week, that is, 114.0 minutes per day.

A total of 19.7% (n=26) and 8.3% (n=11), respectively for the IPAQ and pedometer (p=0.021) were identified as sedentary.

There was no correlation between the IPAQ and pedometer instruments (p=0.471). The Kappa coefficient was 0.021, demonstrating weak correlation between the instruments (Figure 1).

### Discussion

A possible limitation of this study can be pointed as to using IPAQ as a tool for comparison with pedometer. Facing the difficulties of application of that questionnaire, and also of the weaknesses of the validated model for the population studied, composed of students from public schools, this limitation could only be overcome with the comparison of pedometer with other measuring instrument, which also offered direct measures of physical activity and it could be taken as gold standard. Moreover, despite the practicality and the advantages
found in the use of pedometer in the present study, this instrument needs to be tested against direct measurement instruments for assessing the level of physical activity, such as ergospirometers, considered the gold standard, allowing the definition of more specific cut-off points in the number of steps per day, for the evaluation of sedentary lifestyle in adolescents.

The elaboration of strategies to combat the sedentary lifestyle and the prevention of diseases related to physical inactivity as a risk factor go through the identification of adolescents who present this behavior. Thus, the application of instruments such as IPAQ and the pedometer can quantify the amount of physical activity, identifying sedentary adolescents at school or in any environment. These instruments can be widely applicable, since they are easy to use and of low cost.

The prevalence of sedentarism among adolescents, found in this study (19.7%) from the measurement performed with IPAQ, was lower than that found in Malaysian students (20.8%) and also less than adolescents from the Balearic Islands located in the Mediterranean Sea. In two studies conducted in the city of Pelotas in 2005 and 2012, the authors found prevalence of sedentarism of 69.6 and 69.9%, respectively. All studies mentioned used IPAQ in its short version, in adolescents, in similar age range.

The average daily time measured by IPAQ in this study (114.0 minutes per day) was higher than the average recommended by the World Health Organization for the practice of physical activity. Study with 3,556 adolescents aged from 12-19 years old in the United States identified the average time spent with moderate/intense physical activity of 34 minutes a day and sitting time of 7.5 hours.

The IPAQ in its short version presents several disadvantages, especially when applied in adolescents. The main disadvantages identified are the requirement that the participants should quantify the duration and frequency of the various types of physical activity carried out in the previous week, a fact that depends on the memory capacity of each individual; the low degree of accuracy; and the fact that it minimizes the importance of walking in a non-structured way.
Adolescents, in this study, presented great difficulty understanding the questions of the instrument, they needed clarification for the majority of them. It is also worth noting that the structure of the questionnaire does not stimulate the fulfillment and sometimes causes confusion in the characterization of the exercise intensity.

The prevalence of sedentarism identified by applying the pedometer (8.3%) in this study was lower than that found for IPAQ (19.7%). A possible explanation for this fact is that the questionnaires and diaries to evaluate physical activity generally minimize the importance of walking as a form of physical activity. Thus, often, “informal” walking performed by the interviewees are not considered or recalled at the time of evaluation. Pedometer measures all kinds of displacement performed programmatically or in locomotion and leisure activities. Thereby, the pedometer considers as active, individuals who do walk at leisure or work, more precisely measuring than subjective measures such as questionnaires.

The pedometer was a well-accepted instrument by adolescents and the practicality and ease of use have led to a good adherence to this type of evaluation, having encouraged the participation of students in the study.

Average steps per day found were (9,837) less than the average found in a study conducted in Singapore with adolescents aged from 13-16 years old, students of public schools, the authors found 11,913 average steps per day. In another study, conducted in New Zealand, with a similar population, the average number of steps per day was 12,597. However, it is worth noting that these studies were done after a series of government interventions to encourage the practice of physical activity among schoolchildren.

Study conducted with students from 14 schools in a region of Poland identified an average of 12 thousand steps per day, also higher than the value found in the present study.

The indicated cut-off point for the sample of this study (4,012 steps per day) was lower than the cut-off points established for children of 9,000 steps a day and also inferior to the number established for adults (5,000 steps per day). The cut-off point found in this study is similar to another study conducted in the State of Iowa, Midwest of the United States, which set 3,800 to 4,000 steps as cut-off point for sedentarism in the general population.

There was no agreement on the measures undertaken by the IPAQ and the pedometer. Study that validated the IPAQ short version for adolescents in Brazil used the physical activity recall of 24 hours proposed by Bouchard for comparison and presented Kappa coefficient corresponding to a weak/moderate agreement, without statistical significance. It was observed significance only for vigorous activities practiced by boys. This study also found no correlation between the IPAQ and pedometer for the identification of the sedentary lifestyle.

The IPAQ must be used with caution for the assessment of physical activity in adolescents, because they did not consider walking, which is one of the most frequent forms of physical activity in all populations and in any age group. It should be noted that even in the validation study of the instrument among adolescents, the correlation found from IPAQ with the physical activity recall of 24 hours, instrument used for analysis of agreement was weak/moderate.

Conclusion

The International Physical Activity Questionnaire, which is the validated method for evaluation of physical activity among adolescents, when compared to the pedometer, presented higher prevalence of sedentarism, with weak agreement and no correlation between the measures carried out by the two instruments.

Collaborations

Vitorino PVO Barbosa MA; Souza ALL; Jardim PCBV and Ferreira SS declare that collaborated in the design stages of the study, analysis, data interpretation, drafting the manuscript, reviewing relevant intellectual content and final approval of the version to be published.
References


Social support to the families of children with cerebral palsy

Apoio social a famílias de crianças com paralisia cerebral

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Abstract
Objective: To describe the experience of the families of children with cerebral palsy concerning their social support network.
Methods: Qualitative research carried out with 19 families of children with cerebral palsy. Focal group sessions were performed and statements were recorded, thoroughly transcribed and assessed by the thematic analysis technique.
Results: The following thematic categories emerged: Experience of the family in caring for the child with cerebral palsy, and Frail social support concerning family bonds.
Conclusion: The social support network of the families of children with cerebral palsy is basically comprised of family members. Families undergo changes in their daily life and experience unfavorable feelings, seeking in the spiritual realm the hope to cope with adversities.

Keywords
Cerebral palsy; Social support; Pediatric nursing; Nursing primary care; Disabled child

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Introduction

Among the chronic diseases that directly impact children, cerebral palsy cause singular damages to their families by altering several of their lives’ axles, such as time, finance, labor, family and social relationships, physical and psychological health.\(^1\)

In this adaptation process, and in search for answers to the care demands resulting from such disease, families pursue a set of services, such as medical, rehabilitation, education and community services. On the other hand, these services are challenged to look for and support families, in order to meet the needs of children with cerebral palsy,\(^2\) as they call for additional stimuli toward their development.

Caring for a child with cerebral palsy consists of a challenging task, as their physical and emotional demands require effort, dedication and time. Financial, emotional and social distresses are other setbacks experienced by families.\(^3\)

In order to reorient goals and objectives, family members need to reframe emerging daily feelings regarding the new and unusual experiences with the child with such neuropathy. This reorganization requires responsibilities, fears, anxieties and uncertainties to be shared. In this sense, social support networks, as spaces of intersubjectivity, may support the family in financial, psychological and information aspects, among several others. Therefore, the social forces of these support systems may help in the adaptation process toward the children’s care and quality of life.\(^4\)

It is believed that beyond the practical care processes with the child, the family needs a type of support that is able to meet the interdependence needs of individuals.\(^4\) Such support may originate in the elements that compose the network in which the family seeks help to care for their children. Social support networks are deemed to be the structure of relationships among subjects that are tied by affective bonds, a locus where subjective and objective exchanges take place, turning networks into real entities.\(^5\)

In this sense, the present study addresses how families of children with cerebral palsy experience the transformations in their realities, which lead them to seek help in social support networks in order to overcome the difficulties they face in the child’s development process. The objective of the study, therefore, was to describe the experience of families of children with cerebral palsy concerning their social support network.

Methods

This descriptive, qualitative-based research was carried out in a university located in the state of Paraná, in the southern region of Brazil. Inclusion criteria were as follows: being enrolled in the service; being a steady participant in the service; being a family member of children with cerebral palsy in the 0-12 group age; and being a resident in the city of the project. The study was comprised of 19 families.

Data were collected in a controlled environment between November 2012 and January 2013 by means of three focal group sessions and counting on the support of a thematic guide, which addressed family support issues toward the care for children with cerebral palsy. The statements were fully recorded and transcribed. Data were analyzed by the thematic analysis technique, without software support.

The development of this study complied with national and international ethical guidelines for research involving human subjects.

Results

The data analysis process brought about two thematic categories: Experience of the family in caring for the child with cerebral palsy, and Frail social support concerning family bonds. In the first category, the study approached the changes experienced by the family, their feelings and their search for spiritual help. The second category presented the social support network, which displayed a denser support to the family on the part of the closest family members.

Dezoti AP, Alexandre AM, Freire MH, Mercês NN, Mazza VA
Experience of the family in caring for the child with cerebral palsy

In face of the care demands associated with cerebral palsy, the daily life of families undergo several changes, and family members are more intensely dedicated to the care for the child, especially the mother. The uncertainties generated by the medical diagnosis intensify the family’s search for spiritual support.

Such transformations occurring in the heart of the family overloads the child’s major caregiver, who in the case of this study was the mother. She adapted her daily agenda in order to care for her child. When asked about her opinion about cerebral palsy, she blamed herself for the diagnosis and showed significant distress when speaking about the future. Aiming at relieving the intensity of the cerebral palsy diagnosis, the family started leaning upon spiritual beliefs toward coping with the uncertain present and future.

Frail social support concerning family bonds

Family support processes are often dependent on the availability of family members, and usually highlight the responsibility of the mother as the major caregiver. Such support is frequently located at the core of the family, and especially expected from older children; whereas other family members, such as grandparents, husband, aunt and mother-in-law, interact only in occasional opportunities in order to provide the necessary care.

Discussion

The limitation of the results of the present research is related to the qualitative methodology, which does not allow for generalizations. On the other hand, the study highlighted the social support network listed by the families, as well as how families sought to adapt to the daily adversities resulting from cerebral palsy. In face of that, the current care process toward such type of family should be rethought. New research, which could provide practical tools to the families experiencing such a chronic disease, should be produced, so that healthcare professionals may be able to go beyond the biological and individual dimensions and insert not only the child into the care process, but also the whole family, addressing both the healthcare hindrances and the care potentials toward the family and the child’s health needs.

The thematic category “Experience of the family in caring for the child with cerebral palsy” showed that, allied to the changes observed in the family’s daily life following such chronic diagnosis as cerebral palsy, there was a higher care demand and alterations in the family’s social framework related to the development of the child. Moreover, families sometimes do not believe that they will be once again able to dream of a prosperous future anymore.

The present research highlights that due to the excessive care demands toward children with cerebral palsy, the major caregivers are very rarely able to leave them under the responsibility of other people, a fact that disconnects them from their personal lives and prompts them to only care for the children. Such fact is corroborated by another study carried out with caregivers of children with cerebral palsy, who affirmed that they were less willing to leave their children with other people. However, if these caregivers sought for help toward caring for their ill children, they would be able to reap significant benefits.\(^6\)

The transformations that take place in the family’s daily life alter their dynamics and, above all, the caregiver’s life dynamics. Thus, this study observed that the centralization of responsibilities was strongly connected with the mothers, who implied that the daily care for the child with cerebral palsy necessarily brought about difficulties toward maintaining other activities. Such experience emphasizes the essential anguishes and uncertainties experienced by mothers in the search for answers regarding the future of both her child and her family.\(^7\)

The energetic and almost totally exclusive effort of the mother concerning the child with cerebral palsy may be associated with the guilt feeling resulting from the child’s chronic disease, thus mobilizing another type of feeling, the compulsoriness to dedicate one hundred percent of herself to her
child. Such data is corroborated by a study carried out within the Chinese context with mothers of children with cerebral palsy, who also felt guilty and accountable for the child’s impairment.\(^{(8)}\)

Families in this study expressed ambiguous feelings emerging from their experiences with the children’s chronic disease. The mother was the family member that expressed the most diverse types of feelings regarding the chronic condition of the child, ranging from joy to sadness, guilt and questionings about her personal failure during the pregnancy.

This situation generates feelings of sadness, which are justified by the degree of dependence of the child and their life prognosis. The child is expected to present a certain degree of dependence for their entire life, with no chance of getting cured and demanding special care and stimuli toward the promotion of their development, as well as their personal and family quality of life. A study carried out with parents of children with cerebral palsy ratifies the findings of the present study, as the approached family members also experienced a variety of negative emotions ranging from mild anger to exhaustion and frustration.\(^{(9)}\)

These data show that, in face of the situations imposed by the chronic condition of their children and most often by the lack of a more effective support, these families may be stimulated in their search for answers, help and/or meanings in realms of life other than the material, cognitive and affective dimensions, thus taking them to the spiritual realm, aiming at encompassing aspects of their experiences that go beyond the objectivity of life. Hence, in face of the loss of the idealized child and the new routine imposed by the child with cerebral palsy, families find in belief/faith a new pillar toward coping with the daily chronic condition experienced by their children.

Another study that corroborates the data of the present research points out that in order to overcome negative feelings and thoughts about the ill children and to face the dark future promoted by cerebral palsy, parents seek to call upon God,\(^{(9)}\) as spirituality, most of the times, becomes a strong support toward accepting the child’s chronic condition.

In addition to the spiritual support, the family also looks for other types of support toward caring for the child with cerebral palsy. A steady search for care services that may improve the children’s life conditions is often noticed, as it mobilizes families toward seeking multiple resources, so that the children may have a more natural development, in spite of facing such chronic condition.

The “Frail social support concerning family bonds” category points out that due to the intensity of the care imposed by cerebral palsy, the mother takes on the whole care for her child, causing her to carry a heavy burden. The care demanded by this child leads the mother, the child’s major caregiver, to seek support in her closest relational system, especially her other children and other women in the family, such as grandmothers and aunts, with whom she shares the care. Mothers believe that family members are more likely to provide support and attention. As such, these members are usually chosen to help major caregivers.

To corroborate these findings, a study showed that families of children who were born with Apgar ≤3 in the 5th minute and counting on a diagnosis of severe perinatal asphyxia found their social support network within the family universe\(^{(4)}\), thus indicating that the family is a relevant source of care.

The search of the mother for family members, especially women, to help her out in caring for her child may be related to the fact that society has labeled the female gender as the one responsible for the caring act. Such data is ratified by a study that points out that the care responsibilities of mothers are influenced not only by the sex, but also by the expectation that mothers will carry out such duty as a major function.\(^{(8)}\)

Bearing all this in mind, family-centered services should offer social support and develop different strategies to cope with the challenges and needs of caregivers of children with cerebral palsy, with a special attention to mothers.\(^{(10)}\)

The present study highlighted how important it is for healthcare professionals to be prepared to address social support network strategies for families of children with cerebral palsy, so that they are em-
powered to plan a comprehensive care that values the family's specific challenges. Besides broadening family relationships, the approach of a competent professional may generate a set of support and intervention actions and promote the development of the ill children in their maximum potential.

Another study pointed out that the family-centered care may reduce the family's overloads. Hence, it is important that such type of care be inserted into healthcare policies, aiming at both integrating the care services in all healthcare levels,\(^{(11)}\) and improving the quality of life of the families and their children.

**Conclusion**

The social support network of families of children with cerebral palsy is composed of family members, as these are closer to them. These families undergo changes in their daily routine, experience unfavorable feelings and access the spiritual dimension in order to find support to their adversities.

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**Collaborations**

Dezoti AP; Alexandre AMC; Freire MHS; Mercês NNA and Mazza VA declare that they have contributed to the study conception, analysis, data interpretation, wording, relevant critical review of the intellectual content, and final approval of the version to be published.

**References**

Applicability of the results of a user satisfaction survey by nursing

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Gisela Maria Schebella Souto de Moura¹

Abstract
Objective: To analyze the use of the results of a user satisfaction survey by head nurses in inpatient units.
Methods: A descriptive exploratory study conducted at a university hospital. The research tool was a form administered to 14 nurses using interviews. Transcribed testimonies were submitted to content analysis.
Results: Four categories emerged: communication as a means of transmitting information to the nursing team; the contribution of the user satisfaction survey to health care; changes implemented in the units based on survey results; and the influence of the satisfaction survey on the evaluation of nursing team performance.
Conclusion: The information obtained through satisfaction surveys provided an overview of the performance of the nursing service and can assist managers in making decisions. It also serves as a source of information for the assessment of individual employee performance and quality of care indicators.

Keywords
Patient satisfaction; Health evaluation; Nursing research; Nursing service, hospital; Nursing assessment

Descritores
Satisfação do paciente; Avaliação em saúde; Pesquisa em enfermagem; Serviço hospitalar de enfermagem; Avaliação em enfermagem

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Introduction

With the advance of technology and computerization of the means of communication, health service users have new channels of communication for expressing their ideas and needs to those who provide such assistance. Adding the user as a transformational and evaluative agent is a sensitive indicator of service quality, enabling appropriateness of care for user needs, and simultaneously providing real change in health services.(1)

In this context, the satisfaction survey is a tool to evaluate the health service by the user, who analyzes the care received in the institution considering his/her needs when seeking care. The user evaluates each attribute of the survey instrument, exposing his/her opinion regarding the care, thereby providing an important measure of health care quality. The evaluation of care is an essential tool in public policy, as a mechanism both to assess for the possibility of course correction, and to provide continuity of interventions, so that the results are always revised and modified according to the perceived needs and are grounded on the social demands.(2) This way, there is the possibility of considering the subject in his/her specificity, respecting his/her history of life.(3) Hospitals enable the performance of nurses’ activities regarding quality of care when nurses understand the context of health services. Therefore, they care for the user more broadly, seeking to know him/her and to satisfy him/her in his/her expectations, with regard to the care and services available. Conceptually, the term “client”, “patient” or “user” is characterized as one who receives the care or the benefit of a particular work, i.e., to whom a service has been offered or done, and his/her satisfaction becomes a factor of success.(4) In this study, we chose the term “user satisfaction”, instead of “patient/client satisfaction “ because, over the years, the term “user” has become more commonly used in research seeking to know the opinion of people who used health services.

The incorporation of the user in evaluation has been valued because it is possibly related to more appropriate use of services, design of actions that have been developed, and also the possibility of targeting and planning of care. This way, health evaluations have included the measurement of satisfaction as an important measure of quality of care in relation to the care provided or received.(5) User participation stands out as a significant point of these processes, which aids in the transformation of practices of managers, workers and assessors, in the process of the production of health care.(6) This topic is highly relevant to nursing, because it enables one to check how the results of the satisfaction survey are being used by nurses occupying the lead positions, and also to check the real contribution that the satisfaction survey brings to care. Similarly, this topic is considered very important because it enables feedback on aspects that can be improved in the care delivery, and also the identification of those that are already underway, according to the users’ expectations.

The focus of the study was the applicability of the results of the satisfaction survey, and this article aims to analyze the use of the results of user satisfaction survey by head nurses in inpatient units of a public hospital.

Methods

A descriptive exploratory study with a qualitative approach, conducted in a university hospital in the state of Rio Grande do Sul, in southern Brazil, a member of the network of hospitals of the Ministry of Education, with 795 beds. The study population was composed of the head nurses in clinical, surgical, pediatric hematology/oncology psychiatric, and maternal-child inpatient units. For the composition of the sample, the inclusion criterion was having been in the lead position for at least six months. Among the possible 18 participants, 14 nurses fulfilled that criterion.

Data were collected through semi-structured interview, guided by a script with eight questions developed in order to meet the objective proposed in this study. The interview script was preliminarily tested for understanding and its ability to generate the information sought. The interviews were audio recorded and later literal transcription was
performed by the researcher. The audio recordings totaled approximately eight hours. Data were collected from May to July of 2012.

The data were submitted to thematic content analysis. After transcription, free-floating reading and analysis of the testimonies was performed in search of meaning units. From this process, categories emerged that helped uncover the use of the user satisfaction survey results by the head nurses of the inpatient units. In order to ensure the anonymity of the information, the subjects’ testimonies were coded using numbers, following the order of the interviews for the presentation of results.

The development of the study met national and international standards of ethics in research involving human subjects.

**Results**

As for the characteristics of the participants, of the 14 nurses interviewed, two were aged between 30 - 40 years (14%), five were between 40 - 50 years (36%), and seven were between 50 - 60 years (50%). In relation to working time, only six respondents (43%) had worked for less than 15 years; the other eight subjects (57%) had been working for over 15 years. As for the service time as the unit’s head nurse, eight subjects had up to three years; the remainder had more than four years. Regarding previous nursing experience, only three subjects had no experience in other institutions.

The content analysis of the interviews, based on the testimonies about using the results of the satisfaction survey, enabled the identification of four thematic axes.

The first category, named “communication as a means of transmitting information to the nursing team”, gathered the testimonials that mentioned how information from the results of the satisfaction survey is transmitted to the work team. Several communication strategies were used by the group, with communication as an essential tool for nursing, because it favors the exchange of information and dialogue within the nursing team.

The category named “the contribution of the user satisfaction survey to health care” addressed aspects related to the perception of nurses regarding the contribution that research brings to the unit for attending the user. The statements in this category indicated that the satisfaction survey was a way to provide the user with a moment of listening, when he/she can express his/her opinion about the care received.

In the third category “changes implemented in the units based on survey results”, excerpts of the interviews were grouped based upon the units in which the team worked within that hospital, such as improvements implemented in the unit considering users’ requests through satisfaction survey; changes in routine work; greater involvement with the satisfaction survey by the nursing team, due to incentives offered by the institution.

“The influence of the satisfaction survey in the evaluation of nursing team performance” was the emerging category, because it is a theoretical contribution related to the satisfaction theme, in which aspects regarding the management of the work team are inserted through indicators from the user satisfaction survey.

**Discussion**

The discussion about the use of the results of the satisfaction survey by the head nurses reveals weighting placed on the quality of nursing care from the user perspective. However, the qualitative design should be considered as a limitation of this study, because it allows for a deeper understanding of the phenomenon, but does not allow for comparisons and generalizations. Furthermore, although the study was developed in a single university hospital, the discussion can contribute to the understanding of similar situations experienced in other services in academic settings.

The nurses’ testimonies express, in practice, the concern for checking the satisfaction survey results in order to know user perception, and to enable tailoring of activities to staff needs in order to provide quality care. Aspects of the users’ perceptions were
also identified on how the nursing staff acts, and the contributions that the results of the satisfaction survey can bring to the job sector.

When mentioning the communication strategies used as means of transmitting information to the nursing staff, nurses report that communication is an essential skill for professionals in this area, who must constantly pay attention to the content of the information and use it during their daily routine work, whether in the direct or indirect care of the patient. Communication is something that can be used by people, that to which they can attribute sense. There are multiple ways to communicate, in the same way that communication can occur for various reasons and at different levels of hierarchy. (8)

Regarding the communication strategies used by the nursing team, nurses report that they use more than one communication strategy, including verbal, on duty at the time of shift change and in meetings with the team, reporting directly to a person or a group, being face to face at that moment. Shift change is an activity inherent to the nurse’s daily life, at which the transmission of information occurs between professionals who are ending and those who are beginning their work shift. (9) Meetings are seen as a way to pass the results of the satisfaction survey in more detail, pointing out peculiarities, and also allowing room for discussion of managerial and bureaucratic issues.

Another means that nurses use is a visual resource, e.g., a message board, to show the unit results and provide visibility for all shifts. They also use also the intranet of the institution as a means of spreading net information to all team members. When sending messages by this means of communication for the health team, information should be provided in an attractive way in the document, in order to increase the chances that the target audience will read such e-mails. (10)

Information is essential to the management of nursing activities and to support nurses in decision-making, especially with regard to resolution and to minimizing the problems inherent to the unit. (11) Studies show that developing teamwork and maintaining effective communication skills should be considered essential to health service managers. (12)

The interviewees reported the contribution of the user satisfaction survey to the health care team, because the institution can identify the perception of the service user and thus set goals to improve its results, as well as maintaining satisfaction with the care.

In addition to the general quality of the service, the satisfaction survey also evaluates user satisfaction with nursing care. Thus, the quality of a health-care service is directly related to the quality of the interpersonal relationship between users and professionals responsible for health care. There is a consensus that user satisfaction is an integral part of the health care quality, and that its measure contributes to better use of resources and improvement in the performance of various sectors involved in the survey. (13) Studies corroborate these findings by highlighting interpersonal relationships as an important indicator of quality, because users consider the way they were treated and informed during their contact with the institution to analyze the care and make an evaluation. (14)

In this sense, institutions should encourage practices and behaviors that lead to quality performance through a commitment to care improvement. (15) The measurement of satisfaction is an important tool for management and planning. It also plays a fundamental role between the service provider and the user, because it reflects the judgment of the quality of care provided. (16) Listening to the users’ opinions about the function and organization of health services is an action that provides significant benefits to the quality of services offered, since the incorporation of the client’s point of view makes health actions more targeted to the users’ needs. (17)

The category referring to the changes implemented in the units based on the survey results brings reports of changes already made to the physical area of the unit, the environment, and others related to the routines of the work team, as well as changes in the involvement with the survey by the nursing team, which was encouraged in order to capture more user surveys.
Satisfaction is not always only linked to the nursing care. It is known that users evaluate care considering the context in which they are inserted in health. The evaluation of care includes the human resources and the structure used for the service.

Studies show that the environment has a strong influence, by stimulating or inhibiting interaction between the individuals involved. Thus, the environment is not just about the physical space used by people, but also the furniture, the accommodations, the ventilation, temperature, noise and space conditions.

The results of these satisfaction surveys provided justifiable arguments to ensure the acquisition of additional resources in the units. Nursing has the peculiar feature of being a profession oriented by many rules and routines. The steady implementation of these standards in order to organize and standardize the work and human resources management has been configured in a negative way in the evaluation of nurses’ satisfaction in their professional practice, a fact pointed out by nurses who manage health services, who explain that they require more time during activities to meet all the rules and routines of the institution.

The search for quality processes can bring changes in values and behaviors, requiring professionals involved to discontinue mechanized care and promote an organizational environment of excellence.

With regard to the influence of the satisfaction survey on the evaluation of nursing team performance, a theoretical contribution related to the satisfaction theme was found. The nurses used the user satisfaction survey as an indicator of team evaluation, i.e., if the provider was cited with praise or criticism, such situations were registered in a performance evaluation form. After that, the negative points were discussed with professionals to encourage them to improve their posture during care. This measure gives the professional a chance to change, and can improve staff performance within the institution.

Performance evaluation is an ongoing process that is used and perceived differently by members of the same workgroup. Understanding how this is reflected in the group, and within the institution, as well as analyzing its real sense in the context of work, is an important point in the design of and true use of this process. The satisfaction survey provides important indicators regarding the management of the team. This fact was evidenced in the findings of this research. Studies point out that professionals feel more satisfied with their performance evaluation when they have the opportunity to discuss the results with their manager. The performance evaluation can be a tool that favors the employee, the manager, and the care provided, by indicating adjustments, training needs and improvements in working conditions. Both in the national and international contexts, the performance evaluation is seen as a management tool that can motivate professionals to improve their performance, especially on issues related to their behavior within the hospital.

**Conclusion**

Head nurses used the satisfaction survey results to change the care provided to users in inpatient units, in order to adapt the care to the patients’ expectations. It was observed that the satisfaction survey results were used as an indicator of quality of care, guiding managerial decision making. In addition, they were used as source of information for the management of people, more specifically, for the assessment of individual performance.

**Collaborations**

Inchauspe JAF and Moura GMSS were responsible for the project design and development of the theoretical framework, contributed to the intellectual development of the article, the analysis, interpretation of data, preparation, review and approval of the final version to be published. Inchauspe JAF conducted the data collection and organization of information.

**References**


Validation of an instrument to identify actions for screening and detection of breast cancer

Validação de instrumento para identificar ações de rastreamento e detecção de neoplasia de mama

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Maria Gaby Rivero de Gutiérrez¹

Abstract
Objective: To develop and validate a questionnaire to identify the actions performed in screening and detection of breast cancer in Brazil, and to determine its applicability.

Methods: A methodological study, with the participation of three experts and a pilot test with 85 users of four primary health care services, with a descriptive data analysis.

Results: Of the 132 questions formulated and organized in the structure and process dimensions undergoing validation, there was a 96.7% and 78.8% agreement of the evaluators in the first and second rounds, respectively. Most of the questions were understood by those involved in the investigation. The absence of the medical record resulted in the exclusion of 40 questions, resulting in 83 questions in the final version.

Conclusion: The content of the instrument was adequate to evaluate actions to control breast cancer in primary care. The pilot test confirmed its applicability, and the need for improvements in documenting information.

Keywords
Breast neoplasms/diagnosis; Primary health care; Health evaluation; Disease prevention; Validation studies

Descritores
Neoplasia da mama/diagnóstico; Atenção primária à saúde; Avaliação em saúde; Prevenção de doenças; Estudos de validação

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Introduction

Since 1984, Public Health Programs and Policy have directed measures for breast cancer control in Brazil. However, this condition is still a public health issue, as it remains the second most common cancer among women.\(^{(1,2)}\)

Within primary care, the focus of the government program over the past ten years has been: an annual clinical breast exam in women over 40; a mammogram every two years and an annual clinical breast exam between 50 to 69 years of age; an annual clinical breast exam and a mammogram in high risk groups starting at 35 years old; and a monthly breast self-examination as a complementary strategy for self-awareness of the body.

The World Health Organization emphasizes the priority of cancer control, and the implementation of actions, monitoring of those actions, and their continuous evaluation in order to guide decision making across the available resources.\(^{(3)}\) In Brazil, although the screening program for breast cancer was instituted between 2001 and 2006, a study conducted in 28 health public services with 2155 women affected by this condition showed that 39% of them were in an advanced stage (III and IV). In addition, 17% of these evaluations were inconclusive.\(^{(4)}\) These data suggest potential failures in breast cancer screening.

Validity corresponds to precision and the degree to which an instrument measures what it should measure.\(^{(5,6)}\) Although there is no perfect measurement, this is one of the essential requirements that a data collection instrument must have, and the disregard of content validity of an instrument may compromise its accuracy and, consequently, produce unreliable results.\(^{(5,6)}\) In this context, this study describes the development, validation and applicability of a questionnaire directed to the public health care users, to identify the actions performed for screening and diagnosing breast cancer in Brazil.

Methods

This methodological study describes the development, content validation and testing of a data collection instrument in three phases.\(^{(5-7)}\)

First phase - development of the instrument

a) Review of articles and documents about actions for breast cancer control in Brazil.

b) Framework selection: the National Breast Cancer Control Program was adopted as a benchmark for the questionnaire content, and Donabedian’s model was adopted for evaluation of the health care service.\(^{(8)}\) This author proposes evaluation through the systematization of measurable attributes that represent the quality of services and/or stages of production (structure, process and outcomes).\(^{(8)}\) Structure refers to the resources used by the health care service, and the selected attributes were: availability of the physical structure and equipment, staffing and team qualification, existence and operation of logistical resources. The process corresponds to the set of activities developed between professionals and users. For evaluation, the presence and execution of flows and protocols and the availability of professional training were considered.\(^{(8)}\)

c) Definition of the informant and the form of data collection: users of the primary health care service were chosen as informants about the use of the structure and services in this level of care. In order to minimize losses due to registration failures or recall bias, data collection through interviews (86 questions) and consulting of the medical records (46 issues) were proposed.

Second stage - content validation of the instrument\(^{(5-7)}\)

a) Selection of the validation technique - we chose the Delphi technique, which has advantages by eliminating the influence of direct interaction, distance communication, the production of large amounts of high-quality ideas and specificity, in addition to low cost of execution.

b) Selection of evaluators - content validation requires a subjective judgment about whether a measure makes sense intuitively. It refers to the degree to which an instrument represents a domain or the relevance of the items. However, the literature does not mention an ideal number of judges. Thereby, through convenience sampling, five experts were asked to participate. They were trained in the mastology area and/or evaluation of policies or health
program focused on primary care. Only three responded to the questionnaires.

c) Degree of agreement analysis - the experts were asked to evaluate, by means of an instrument, the set of variables considered important by choosing one of the options: strongly agree, partially agree, and disagree. The criteria adopted for the consensus level of the evaluators were: 1 - Maintain the question whenever there was complete agreement among all evaluators; 2 - Redesign whenever the agreement was partial, or whenever only one evaluator disagreed whereas two of them completely agreed; 3 - Delete the question when there was partial agreement, or disagreement between more than one evaluator. Suggestions were also considered, which resulted in the creation of new questions and changes made by the authors, later justified and submitted to the judgment of experts in the subsequent round of evaluation. For each validation round, the mean of the proportions of the questions (items) considered relevant was calculated, i.e., those that obtained a complete agreement and/or a partial agreement by only one of the evaluators. As some authors suggest, we considered the minimum agreement of 70% for instrument validation.

Third step - test of the questionnaire applicability, conducted in two weeks in February 2011

a) Study area – of the five municipal regions of São Paulo, the southeast region was selected because it is an area of education and university research. Within this territory of 211.89 Km², 90 primary health care service exist that attended 585,120.00 women <20 years old per month.

b) Sample inclusion criteria - basic health units constructed after January 2006, and users aged ≥35 years, being followed-up for more than three years in the service, who signed the Term of Free and Informed Consent Statement.

c) Sampling - the budgetary and time constraints, as well as the population heterogeneity and extent of the study area hampered enlisting the women in the study area, leading to a complex sampling plan in two stages. This type of sample consists of selecting individuals belonging to subunits that concentrate on groupings forming conglomerates. A confidence level of 95% was considered, design effect equal to two with a sampling error of 5%, resulting in a sample of 760 users of 38 services. However, the instrument was administered by five trained interviewers to 85 users in four primary health care services, corresponding to approximately 10% of the sample.

d) Evaluation of the participants’ understanding and difficulties in the field – a content analysis of the reports of the trained interviewers was performed, about the questions that they and the users found difficult to understand, as well as difficulties encountered during data collection.

e) Time taken for instrument administration - the start and the end time of data collection was documented on the instrument itself, which enabled calculation of the mean time of the interviews.

f) Calculation of missing data - performed according to the distribution of the missing responses in relation to the number of interviews and records investigated, considering a 95% confidence interval.

The development of the study met national and international standards of ethics in research involving human subjects.

Results

In the literature review, the actions aimed at primary health care of the breast cancer control program in Brazil were identified as priorities and selected as the standard for the construction of the instrument, as presented in chart 1.

The actions listed in chart 1 were organized according to the attributes of the structure and process dimensions. The variables related to structure were: reason for rebooking or not having the mammogram and breast ultrasound, and schedule availability of the women. The reference variables for process were: identification of risk factors; implementation and teaching of clinical breast examination; request, execution and guidance regarding mammography; guidance and teaching of breast self-exam; performance and guidance regarding...
Validation of an instrument to identify actions for screening and detection of breast cancer

Chart 1. Actions for the control of breast cancer in primary care

<table>
<thead>
<tr>
<th>Actions</th>
<th>Periodicity</th>
<th>Indication</th>
<th>Necessary structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical breast exam</td>
<td>Annual</td>
<td>Prioritized women aged ≥ 40 years.</td>
<td>Trained nurse or physician, and offices.</td>
</tr>
<tr>
<td>Mammography</td>
<td>Depends on age</td>
<td>Women ≥ 50 years - every 2 years. Women ≥ 35 years at high risk for breast cancer - annual.</td>
<td>One mammography device per 240,000 inhabitants, referral availability, trained professionals.</td>
</tr>
<tr>
<td>Breast self-exam</td>
<td>Monthly</td>
<td>Self-awareness of the body of every woman. Any date for climacteric women and a week after menstruation for other women.</td>
<td>Nursing staff, physician, consultation office and educational material.</td>
</tr>
<tr>
<td>Educational meetings</td>
<td>Not mentioned</td>
<td>Every woman in the target group aimed at adherence to the actions.</td>
<td>Health professional and educational material.</td>
</tr>
<tr>
<td>Recall</td>
<td>Not mentioned</td>
<td>Prioritize women who do not have the tests done, those missing, and those with abnormal tests.</td>
<td>List of target women and health professionals.</td>
</tr>
<tr>
<td>Woman appointment book</td>
<td>Not mentioned</td>
<td>Every woman in the target group, aimed at adherence to the actions.</td>
<td>Women’s and health professionals’ schedule.</td>
</tr>
<tr>
<td>Mammography Information System (SISMAMA)</td>
<td>Not mentioned</td>
<td>Each worker in primary health care service and the imaging service completes the digital form of each mammography performed.</td>
<td>Computer with operating system and skilled administrative professional.</td>
</tr>
</tbody>
</table>

Chart 2. Organization of the user questionnaire questions to assess the actions for breast cancer control in primary care

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Number of questions</th>
<th>Interview</th>
<th>Medical records</th>
<th>Variables</th>
<th>Number of questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information</td>
<td>8</td>
<td>0</td>
<td></td>
<td>Interview date, interviewer code, interviewer’s name, type and name of the primary health care service, specification if Family Health Strategy staff, start and end time of data collection.</td>
<td>8</td>
</tr>
<tr>
<td>User identification</td>
<td>5</td>
<td>0</td>
<td></td>
<td>Medical record number, initials, address, telephone number and date of registration.</td>
<td></td>
</tr>
<tr>
<td>User information</td>
<td>8</td>
<td>0</td>
<td></td>
<td>Age, marital status, race, education, income source, household income, health insurance, criteria for use of the health insurance.</td>
<td>8</td>
</tr>
<tr>
<td>Risk factor</td>
<td>7</td>
<td>7</td>
<td></td>
<td>Family history of breast or ovarian cancer, breast cancer before 50 years of age, bilateral breast cancer at any age, male breast cancer, ovarian cancer at any age, breast biopsy, type of tumor biopsyied.</td>
<td>7</td>
</tr>
<tr>
<td>General actions</td>
<td>9</td>
<td>2</td>
<td></td>
<td>Medical/nursing consultation in the last four years, frequency of visits per year, woman appointment book, professional who investigated risk factor, call to the primary health care service to make mammogram or clinical breast exam appointment, participation in appointment.</td>
<td>9</td>
</tr>
<tr>
<td>Breast self-exam</td>
<td>7</td>
<td>8</td>
<td></td>
<td>Age started, if menstruating, if breast self-exam is performed, frequency, how they learned, when they perform, reason why they do not perform.</td>
<td>7</td>
</tr>
<tr>
<td>Clinical breast exam</td>
<td>15</td>
<td>9</td>
<td></td>
<td>Age indication, performed by the primary health care service or complimentary health, year performed, difficulties, who made the request, the elapsed time between request and the result, site where performed, changes identified, conduct, reason for not having the exam at the basic health unit.</td>
<td>15</td>
</tr>
<tr>
<td>Mammography</td>
<td>15</td>
<td>10</td>
<td></td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Breast ultrasound</td>
<td>12</td>
<td>10</td>
<td></td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>86</td>
<td>46</td>
<td></td>
<td></td>
<td>86</td>
</tr>
</tbody>
</table>

pap smear test of nursing and medical consultation. Chart 2 provides a breakdown of the variables considered in the study and their grouping into nine blocks.

The experts participating in the content validation of the user instrument had ten to 20 years of experience; two were active in teaching and research in public health, and in the care and research in mastology.

In the first version of the instrument, eight of the 132 questions related to the identification of the primary health care service and the interviewer were not sent.

In the first round of the 124 questions evaluated in June of 2010, 66.9% (83) had full agreement between the three evaluators, 29.8% (37) had partial agreement, with 24.2% (30) of one evaluator and 5.6% (7) of two evaluators, and; 3.3% (4) had a disagreement of one evaluator, resulting in 42 questions being maintained, 61 reformulated, 21 excluded, and 11 created. From this analysis, the 114 questions added to the eight others relating to the identification totaled 122 questions in the second version.

In the second round of validation, performed in September 2010, 80 questions of the total 122 were evaluated, of which 63.8% (51) had full agreement of three evaluators, partial agreement was 12.5% (10) of one evaluator and 2.5% (2) of two evaluators; 21.2% (17) had disagreement of one evaluator; resulting in 47 questions maintained, 30 reformulated, three excluded, and five created, generating the third version with 124 questions.

In the first round, there was a 91.2% complete and/or partial agreement of only one of the evaluators. In the second round, 76.2% was obtained and in both rounds, the mean agreement was 83.7%.

After the instrument was field-tested and analyzed, 11 questions were identified that were considered difficult to understand by the interviewers, and included the following justifications and sug-
gestions: item was not formulated as a question, reason for not performing a clinical breast exam independent of the patient, lacked alternative response, and the space for description of some data was considered insufficient. For the seven questions considered difficult to understand by the interviewees, the justifications and suggestions were: change the way of asking about income and education, replacing them with number of minimum wages and series, respectively; translate unfamiliar technical terms into popular language (biopsy, breast exam, breast ultrasound, breast self-exam and basic health unit); the term referral guide of the examination had better understanding than just referral, and the answer choice “housewife” caused discomfort.

The difficulties mentioned by the field team were: long form, with little space to provide the address and the medical record number; lack of explanatory text that elucidated the terms that were difficult to understand; need to change response options, and to avoid repetition of questions with the development of sub-questions.

The time spent in the interview of users varied, on average, from three to 18 minutes. In collecting data from the files of users, the poor quality of records and of their archiving resulted in low use of this source of information, since of the 40 questions collected, lost responses were ≥40%, and then were excluded. The suggestions were accepted and one question was created, resulting in the final version with 83 questions (Chart 3).

**Discussion**

The assessment of a measurement accuracy through construct, criterion and/or content validation of a data collection instrument is an item considered desirable in scientific research; additionally, the literature also recommends that the reproducibility is measured by other tests, namely measure of reliability or psychometric tests.(5-7) Thus, other validation tests such as the criterion and construct and reliability measures may be applied to the questionnaire presented here, which was only submitted to content validation. It should be noted that obtaining the research authorizations of individuals and all the institutions involved (University, Evaluators, City Health Department, Southeast Regional Health Coordination, manager of primary health care service, and the user) required significant time. In addition, the magnitude of the phenomenon studied generated an extensive questionnaire, requiring even more time and articulation to complete its validation (eight months) and
Validation of an instrument to identify actions for screening and detection of breast cancer

pilot test (two weeks), thus made impossible the measurement of its reliability.

Even so, this study allowed for the construction, content validation and measuring the applicability of the questionnaire for the evaluation of screening actions of the Brazilian program for breast cancer control.

Content validation requires availability of time to do the analysis from the evaluator, in addition to competence in the subject. This last factor probably contributed to only three of the five specialists who were invited to participate in the study, and resulted in a long period of time for them to send their responses. Supported by the literature, which mentions that no ideal number of judges exists,\(^5\) as well as the fact that the variables of the instruments have been extracted from a national public health program, previously obtaining consensus by specialists, it was considered that the assessment made by the three judges achieved its goal, since they considered that the instrument had incorporated most of the essential elements of the investigation.

The degree of agreement obtained for the user instrument, whether on the first round of validation, or the second, demonstrated the relevance of the questions. It should be noted that the observations of experts helped improve the content of the questions and the grouping of actions.

Part of the sample was used for the validation of the questionnaire, as well as logistical evaluation and feasibility studies. Thus, supporting the literature,\(^10,11\) the application of validated instruments and field team notes enabled measuring the mean time for data collection, the level of understanding of the content, helped identify the main difficulties, the possible conditioning factors, and the means to circumvent them. The suggestions and comments of the interviewers about the content of the instrument helped make the language of some questions accessible to the target population.

With regard to interviews with users, despite having been referred by the interviewers that some technical terms appeared to be unknown to them, the low absence of response rates to the questions suggests that their formulation favored understanding by the target audience saving time, probably associated with the training offered, suggesting that this model could be applied in a larger sample.

In an instrument, many missing data may indicate poor formulation of a particular item or difficulty in data collection.\(^12,13\) It must be considered that a variable can also be investigated in a cluster of related questions (sub-questions) which, depending on the alternative chosen, could lead to no response to the others. This situation was identified in this study, a fact that led to the maintenance of many questions in the instrument, although there were significant losses. Regarding the medical records of the users in the primary health care service, the decision to dismiss them was mainly due to the absence of records of the professionals, and the low quality of archiving of the information.

Missing data made it difficult to analyze the results of the research, because the majority of these procedures were not designed for them. Although not the main focus of research, missing data is usually a nuisance and handling it has been a computational challenge.\(^12,13\) Missing data may generate two major problems. The first is the reduction of statistical power, namely, reduced power to find an association between a data set; and, the second is the possibility of directing a biased estimate. Among the various possibilities of existing treatments, the literature supports the disposal of the variable that does not have an important effect along with the outcome.\(^12,13\)

The expansion of health care through decentralization and focusing on preventive actions has been gradually occurring since 1988.\(^14\) In the city of São Paulo, this network reorganization started in the year 2000, and during this period, research that used data from medical records showed the poor quality of records and storage of information. After 11 years, the same situation is perpetuated, indicating the existence of gaps in clinical consultations of physicians and nurses, failures in auditing services, and the fragility of this source. The medical record is a collection of documents in which health professionals describe patient data in a standardized, organized and concise manner. These recordings guarantee the continuity of care, security of professional
and patient. It is also useful for teaching and conducting research and audits. The absence or poor quality of records makes it difficult to monitor and evaluate health practices, as well as to meet needs, failing, in this case, to contribute to improvements in public service care delivery in a manner that can resolve the population’s needs.

The absence of medical record showed that this source of information is inadequate to monitor the practices and needs improvement.

**Conclusion**

The validation process resulted in adequacy of the content in the questionnaire developed to measure screening actions recommended by the National Program for Breast Cancer Control. Also, the reduced missing data in the interviews, which were the reference for understanding of most questions, as well as the few difficulties in the field and the time spent on data collection, indicate that the validated instrument is applicable.

**Acknowledgements**

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**Collaborations**

Figueiredo EN participated in the design, analysis and interpretation of data, paper writing, critical review of the content, and approval of the final version. Marques CAV and Gutiérrez MGR having contributed in the conception of the project study, design, analysis and interpretation of data, paper writing, critical review of the content, and approval of the final version.

**References**

Nursing diagnoses for urinary disorders in patients with Parkinson’s disease

Diagnósticos de Enfermagem sobre alterações urinárias na doença de Parkinson

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Rosimere Ferreira Santana²
Beatriz Guitton Renaud Baptista de Oliveira²

Abstract

Objective: To analyze the mapped nursing diagnoses included in the Urinary Function class, Elimination and Exchange domain of the NANDA International taxonomy, for Parkinson’s disease patients from a rehabilitation program.

Methods: A descriptive, cross mapping study whose primary source of data was 67 electronic medical records with five or more nursing assessments recorded. Electronic data collection was performed in three steps: identification of terms, mapping and validation.

Results: The scope of the taxonomy was observed for identifying urinary changes. Seven nursing diagnoses were mapped. Impaired urinary elimination was the most common (60%) and, in most cases, was associated with other specific diagnoses, such as urge (55%), reflex (25%), stress (12%), overflow (10%), and functional urinary incontinence (6%).

Conclusion: The analysis of the mapped nursing diagnoses indicates the complexity of urinary disturbances in patients with Parkinson’s disease.

Keywords
Parkinson’s disease; Urinary incontinence; Geriatric nursing; Nursing diagnosis

Descritores
Doença de Parkinson; Incontinência urinária; Enfermagem geriátrica; Diagnóstico de enfermagem

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

Parkinson's disease is a neurological and progressive disorder characterized by an association of motor and nonmotor changes. Among the motor changes, the cardinal symptoms of the disease are highlighted: tremor, rigidity, dyskinesia and postural imbalance. Non-motor symptoms are characterized by autonomic (bladder, bowel, postural hypotension, and dysphagia) and mental dysfunctions (mood changes, cognitive and psychiatric).(1)

Urinary dysfunction, a nonmotor symptom, is one of the most common autonomic manifestations in Parkinson's disease (PD) and has different pathophysiology, described as sphincter dyssnergy, detrusor overactivity and detrusor with a hypo- or areflexic activity.(2) The vascular changes in PD can be potentiated by comorbidities, such as prostatic hyperplasia in men and obstetric history in women. It may also be potentiated by motors deficits from the disease itself, in both sexes.(2)

In most cases, the symptoms of urinary dysfunction have little influence on the motor symptoms of the patient with PD, except in cases of urinary tract infection. However, it is clear in clinical practice that the disease leads to an impact on the quality of life. In this context, the management and treatment of bladder symptoms call for a multidisciplinary approach to the rehabilitation program.

To achieve significant results in the treatment of this condition, it is essential to use accurate descriptions of the symptoms described by the patient. The selection of the signs and symptoms reported by patients should be made in detail, both for planning of the treatment as well as to guide the clinical reasoning of nurses.(3)

Currently, studies related to urinary disorders in individuals with PD focus mostly on pharmacological treatment, such as the use of anticholinergic medications and alpha blockers.(8) However, there are few studies that address the nurse in relation to differential nursing diagnosis or to substantiate the conduct of nursing professionals.(1,4)

The term “differential diagnosis” leads to the context of the nursing process and the use of standardized language, through a selected classification system. This is an invaluable resource in the modern world, especially in transmitting information, scientific communications, technological and professionals.(6) Among the various nursing classification systems, there is the taxonomy proposed by NANDA International (NANDA-I ), created as a tool for diagnostic standardization.(4)

Given the above, this study aimed to analyze the mapped Nursing Diagnoses included in the class “Urinary Function”, inserted in the domain of Elimination and Exchange of NANDA-I taxonomy, based on records of patients with Parkinson's disease of the rehabilitation program.

Methods

This is a clinical, observational, descriptive, quantitative and retrospective study, developed in accordance with the methodological procedure proposed by cross-mapping. The primary source for data collection was the electronic medical record, in which the nursing diagnosis was described in a non-standard pattern. The cross-mapping was selected because allows the linguistic and semantic comparison between non-standardized terminologies with the NANDA-I classification system.(5,6)

The study was conducted at the International Center for Neurorehabilitation and Neuroscience, inaugurated in May 2009 and located in the city of Rio de Janeiro (RJ), in southeastern Brazil. The institution receives adult patients and children with congenital or acquired lesions of the central and peripheral nervous system.

In order to delineate the study population, was verified that, between May 2009 to April 2013, 1,266 patients were admitted with the diagnosis of Parkinson's disease (G20.0), according to the International Classification of Diseases (ICD10). For sampling definition, we chose to use as a criterion for inclusion, the records which five or more nursing evaluation was present. The exclusion criteria included those record containing, other medical diagnoses in addition to the diagnosis of Parkinson's disease,
which characterized other parkinsonian syndromes, such as secondary parkinsonism (G21), for example.

Thus, a total of 148 records were obtained. Given the magnitude of the sample, the sample calculation for descriptive studies, with probability sample, the simple random type was used through the formula:

\[ n_0 = \frac{1}{(E_0)^2} \]  
\[ n = \frac{N \cdot n_0}{N + n_0} \]

In this case were considered: \( N = \) population size (148 records); \( E_0 = \) tolerable sampling error (9%); \( n_0 = \) first approximation of the sample size (123 records); and \( n = \) sample size (67 records). Thus, the sample was composed of 67 records, representing 45% of the total population, considering the sampling error of 9% and 95% confidence interval.

Data collection to the composition of a database occurred electronically and was performed in three steps: identification of terms, mapping of nursing diagnoses and validation of nursing diagnoses.

In the first step a first Excel spreadsheet for Windows were developed with the following areas: patient data; medical diagnosis and clinical characteristics of presentation of Parkinson’s disease; evolution excerpts in usual language of the team; nonstandard terms of nursing to indicate diagnostic hypotheses. These data were submitted to spelling corrections, adjustment of verbal tenses, uniformity of gender and number and exclusion of repetitions, synonyms and casual expressions, which do not designate particular concepts.

In the second stage, the mapping of Nursing Diagnoses itself, a second spreadsheet was developed, specifically containing nine nursing diagnoses of class “Urinary Function” of domain Elimination and Exchange of NANDA-I classification. The database was organized with the following elements: title diagnosis; definition; related factors (causal factors associated with diagnoses); and defining characteristics (confirmatory clinical evidence of the presence of diagnoses). Per process analysis of the spreadsheets, the establishment of comparing between the terms non-standard taken from the records to standard terms by NANDA-I was possible.

For the cross-mapping of the nursing diagnoses, the rules to map the context of Nursing Diagnosis as well as the meaning of words and not just words were used.

In the third stage, the patient data, terms of Nursing and comparison with the NANDA-I classification were analyzed by two specialist nurses in the area of Nursing Classification and three of Parkinson’s disease area. For selection of experts, the practical experience were considered (minimum of five years experience) or having doctorate and experience in research on System of Nursing Classification. The validation occurred in two cycles, individual first and second in groups. After the second cycle, the consensus of experts was obtained and the data presented in this study, descriptively, were derivate in exact agreement on 100% of the evaluators. Given the consensus among experts, after the second cycle, the statistical analyze agreement was no longer necessary.

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

**Results**

The sample consisted of 67 records of patients with Parkinson, 63% of them males. The mean age was 69.3 years and the duration of the disease was 1-24 years.

98 Nursing Diagnoses were mapped obtaining seven different diagnoses corresponding to the class “Urinary Function” in Elimination and Exchange domain. The principal terms extracted from medical records and contextualized as related factors of Nursing Diagnoses were “age”, “Parkinson’s disease”, “volumetric enlargement of the prostate” and “motor deficit,” described in NANDA-I taxonomy as “sensory-motor impairment”, “Multiple causality” and “neurological impairment”. The diagnosis of “impaired urinary elimination” and “urge urinary incontinence” were the most mapped, on 41 and 38% of the files (Table 1).
The survey data showed that in 52.5% of cases in which the diagnosis of “impaired urinary elimination” was present, a second diagnosis was associated, especially to “urge urinary incontinence,” as shown in Table 2. This was due to the fact that the patient had symptoms consistent with the defining characteristics to the corresponding diagnostics.

For a better understanding of how the interrelationship between the diagnoses, Table 3 describes the defining characteristics that enabled the clinical reasoning in selecting the most appropriate diagnosis during the mapping process. Of the 113 defining characteristics mapped, there was a prevalence of “Reports involuntary loss of urine with bladder contractions” (33%), followed by “Nocturia” (19%).

Table 1. Cross-mapping class of Nursing Diagnoses of class “Urinary Function,” of Elimination and Exchange domain, according to NANDA-I, in the records of patients with Parkinson’s disease of an rehabilitation program

<table>
<thead>
<tr>
<th>NANDA-I domain</th>
<th>NANDA-I class</th>
<th>Nursing diagnosis according to NANDA-I (code)</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elimination and Exchange</td>
<td>Urinary function</td>
<td>Impaired urinary elimination (00016)</td>
<td>40(41)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Urge urinary incontinence (00019)</td>
<td>37(38)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reflex urinary incontinence (00018)</td>
<td>7(7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stress urinary incontinence (00017)</td>
<td>4(4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Functional urinary incontinence (00020)</td>
<td>4(4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Overflow urinary incontinence (00176)</td>
<td>4(4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Readiness for enhanced urinary elimination (00166)</td>
<td>2(2)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>98(100)</td>
</tr>
</tbody>
</table>

Table 2. Frequency of Nursing Diagnosis “impaired urinary elimination,” according to the taxonomy of NANDA-I, associated with other diagnoses contained in the class “Function Urinary”, Elimination and Exchange domain.

<table>
<thead>
<tr>
<th>Association among the nursing diagnosis of Urinary function class</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impaired urinary elimination AND Urge urinary incontinence</td>
<td>21(70)</td>
</tr>
<tr>
<td>Impaired urinary elimination AND overflow urinary incontinence</td>
<td>3(10)</td>
</tr>
<tr>
<td>Impaired urinary elimination AND Functional urinary incontinence</td>
<td>3(10)</td>
</tr>
<tr>
<td>Impaired urinary elimination AND Readiness for enhanced urinary elimination</td>
<td>1(3)</td>
</tr>
<tr>
<td>Impaired urinary elimination AND Reflex urinary incontinence</td>
<td>1(3)</td>
</tr>
<tr>
<td>Impaired urinary elimination AND Stress urinary incontinence</td>
<td>1(3)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Defining characteristics of diagnoses, according to NANDA-I, identified in records of patients with Parkinson’s disease of rehabilitation program.

<table>
<thead>
<tr>
<th>Nursing diagnosis NANDA - I</th>
<th>Defining characteristics NANDA - I</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impaired urinary elimination</td>
<td>Nocturia</td>
<td>22(19)</td>
</tr>
<tr>
<td></td>
<td>Frequent voiding</td>
<td>17(15)</td>
</tr>
<tr>
<td></td>
<td>Urinary urgency</td>
<td>14(12)</td>
</tr>
<tr>
<td></td>
<td>Reports involuntary loss of urine with bladder contractions</td>
<td>37(33)</td>
</tr>
<tr>
<td>Urge urinary incontinence</td>
<td>Sensation of urgency to void without voluntary inhibition of bladder contraction</td>
<td>7(6)</td>
</tr>
<tr>
<td>Reflex urinary incontinence</td>
<td>Involuntary leakage of small volume of urine (with coughing, laughing, sneezing on exertion)</td>
<td>2(2)</td>
</tr>
<tr>
<td></td>
<td>Reports involuntary leakage of small volume of urine (with coughing, laughing, sneezing on exertion)</td>
<td>2(2)</td>
</tr>
<tr>
<td>Stress urinary incontinence</td>
<td>Involuntary leakage of small volume of urine (with coughing, laughing, sneezing on exertion)</td>
<td>2(2)</td>
</tr>
<tr>
<td></td>
<td>Reports involuntary leakage of small volume of urine (with coughing, laughing, sneezing on exertion)</td>
<td>2(2)</td>
</tr>
<tr>
<td>Functional urinary incontinence</td>
<td>Time between sensation of urge and ability to reach the toilet is too short</td>
<td>3(3)</td>
</tr>
<tr>
<td></td>
<td>Completely empties bladder</td>
<td>1(1)</td>
</tr>
<tr>
<td>Overflow urinary incontinence</td>
<td>High post void residual volume</td>
<td>4(4)</td>
</tr>
<tr>
<td></td>
<td>Bladder distention</td>
<td>4(4)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>113(100)</td>
</tr>
</tbody>
</table>

Discussion

Although it is recognized the inherent methodological limitation to cross mapping, as data collected retrospectively and with different professional records, the reliability and validity of the data reported by the specific characteristics of the study location, such as the uniform staff training; the definition of patients by specialty; and the detailed record of the multidisciplinary team. Such characteristics contribute to the strength of the data. Even though the nurses have not formally performed the nursing diagnosis, the collecting data was easy, and from that starting point, the selection of the Nursing Diagnoses.

It is common the association of Parkinson’s disease with motor limitations in clinical practice, however, little is discussed about urinary bladder changes related to this comorbidity. Thus, it was necessary to pay attention to the magnitude of the occurrence of diagnostic class “Urinary Function” and as its main characteristics contributed to demonstrate an important nursing practice area in Parkinson’s disease and rehabilitation.
The majority mapping of diagnosis “impaired urinary elimination” was able to reveal the high incidence of nocturia, increased frequency and urgency in patients with Parkinson’s. Despite the bladder status detail of these patients, other features could be established and subsidized diagnostic choices of nurses.

The coexistence of nursing diagnoses mapped within the same class of the taxonomy was observed in this study. There was, then, the need to assess the hierarchy of diagnostics so that, in a more assertively way, the treatment plan of the patient could be defined. The taxonomy of NANDA-I admits the existence of a hierarchical tree of Nursing Diagnoses. In accordance with this reasoning, the presence of natural defining characteristics to different diagnostic mapped were observed. (6)

After mapping, it was observed that the same patient could, for example, present “nocturia” and “reports of involuntary loss of urine with bladder contractions,” defining characteristics of the diagnosis of “impaired urinary elimination” and “urge urinary incontinence” respectively. There was coexistence of accurate diagnosis and need for discussion on the need for organizing them hierarchically. (4,7) In this context, the diagnosis of “Urge Urinary Incontinence” was considered hierarchically superior in relation to ‘impaired urinary elimination.” (7)

Data indicate that nurses in the area of rehabilitation, after identifying bladder change has tended to investigate specific signals and thus identify hierarchically higher diagnosis. From this process, the nurse could deepen their research and determine the best diagnosis that guide their practice and the therapeutic procedure. (7)

The data also revealed the extent of the NANDA-I taxonomy in the identification of urinary disturbances in patients with Parkinson’s disease and showed the complexity of them, since of the nine diagnoses in that class, seven were mapped. Studies related to the nonmotors symptoms not Parkinson’s disease reported the high prevalence of bladder changes, revealing its existence in 38-71% of patients. In these studies, there was no discrimination of different types of bladder changes. (2,3)

“Urge Urinary Incontinence” was considered a specific diagnosis and, according to the publications on the subject, is related both to own Parkinson’s disease due to overactivity of the detrusor Parkinson’s muscle of the bladder, as other causes, such as idiopathic presentation seen in men and women aged over 65 years, due in part of latent cerebral ischemia. (3)

The Nursing Diagnosis “Overflow urinary incontinence”, identified in the survey reaffirmed the multiple causes of bladder symptoms in patients with Parkinson’s. Overflow urinary incontinence, was associated to men with benign prostatic hyperplasia, which is a chronic, complex, progressive disease and which is related to lower urinary tract symptoms, in addition to affecting the quality of life of affected patients. It was considered the most common urological disease and the leading cause of outpatient care to specialists, and is the second cause of surgery. The prevalence for men of 40 years and older was estimated at 17%, going to 30% in men over 70 years old. (8)

The Nursing Diagnosis “urinary incontinence” was related to a common condition of older women, often, having urine losses related to the weakening of the pelvic floor muscles. The problem can occur at any age, but the prevalence and degree of urinary incontinence in women increases with age. For isolated stress urinary incontinence, the prevalence in women aged between 15 and 64 is 10 to 40%. (9)

Conclusion

The survey of a variety of terms, as from the non-standard language, reaffirmed the complexity of urinary disturbances in patients with Parkinson’s disease. Impaired urinary elimination diagnosis was more present in the mapping. The standardization of language in this context enables the normalization and improvement of care, and facilitates the exchange of information among researchers of the subject.

Collaborations

Campos DM; Tosin MHS; and Blanco L collaborated in the design stages of the study, analysis, data
interpretation, article writing, critical review of the relevant intellectual content and final approval of the version to be published. Santana RF and Oliveira BGRB declare that contributed to the writing of the article, relevant critical review of the intellectual content and final approval of the version to be published.

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