BEING A MEMBER OF AN EFFECTIVE TEAM

DOI: 10.5327/Z1414-44252015000400001

Teamwork is essential for Patient Safety and factors such as greater complexity of diseases, increased specialization in care, increased comorbidities, shortage of workforce and increasing technological innovations are more and more present in all scenarios of patient care. The health work involves many professionals, who need to be well coordinated, and there must be good communication between them at all times[1].

The development of collective activities involving various technical interventions, interaction of professionals from different fields and built through a mutual relationship, constitutes a dynamic model, and is premised on the quality of communication between members, professional autonomy, trust, mutual respect, cooperation and conflict management[1,2]. This way of working is essential in activities that involve the entire perioperative process.

While all agree on the importance of teamwork, this is subject to different interpretations. The results of an investigation on the Safety Culture, performed with surgical team members, showed that the chief surgeon was the only one to realize the benefits of teamwork in the team which he participated (70%). The other members of the same team, such as anesthesiologists, nurses and residents in anesthesiology, when asked about the functionality of the team they participated in, had results of 40, 30 and 10%, respectively, showing different perceptions[3].

The implementation of the Safe Surgery Protocol in institutions is a necessary step for teamwork to happen. However, there is much to be done yet, and professionals need to develop skills aiming for Patient Safety, regardless of the role they exercise.

The surgical nursing professionals play an important role in the performance and development of teamwork, as they focus their attention on the needs of intraoperative care and manage the demands of the teams working in this scenario, in a time of great patient vulnerability.

However, there is still difficulty in working as a team, be is because this competence has not been developed during the training of the students or because it is not regularly exercised during the care activities in the daily life of professionals. Studies indicate that work without cohesion, with communication problems, without recognizing the importance of other professionals or in an environment in which there is fear to point out flaws in the process, significantly increases the chances of adverse events[1].

Thus, we face the challenge of looking at how teamwork has been carried out within institutions. We must stop, adjust, and then evolve to another important concept, which is the successful team.

The term comes from a model developed by researchers to whom the safety of aircrafts in flight and the prevention of aircraft accidents were the focus, and was called Crew Resource Management (CRM). It analyzes and acts on aspects of human relations in groups that are recognized as key determinants of performance of the teams responsible for the operation of an aircraft. The model strives for the skills that enable crew members, regardless of the position they hold, to satisfactorily manage the entire flight process, and especially the entire decision-making process, so that the resulting decisions are appropriate and timely in terms of safety and accuracy.

This outlines a challenge to be conquered, which is to develop skills with and among healthcare professionals, to leverage the empowerment of the people involved so that everyone can contribute to the development of the Patient Safety Culture.

Profa. Dra. Elena Bohomol

Habilitated Associate Professor in Escola Paulista de Enfermagem, Universidade Federal de São Paulo – Unifesp – São Paulo (SP), Brazil.

REFERENCES

1. World Health Organization, World Alliance for Patient Safety. WHO patient safety curriculum guide: multi-professional edition [Internet]. Geneva: World Health Organization; 2011 [cited 2013 Jul 31]. Available from: http://whqlibdoc.who.int/publications/2011/9789241501958_eng.pdf

2. Peduzzi M. Trabalho em equipe. In: Pereira IB, Lima JC, organizadores. Dicionário da educação profissional em saúde [Internet]. 2ª ed. rev. ampl. Rio de Janeiro: Fundação Oswaldo Cruz, Escola Politécnica de Saúde Joaquim Venâncio; 2008 [cited 2013 Jul 31]. Available from: http://www.epsjv.fiocruz.br/ dicionario/verbetes/traequ.html

3. Wachter RM. Compreendendo a segurança do paciente. Porto Alegre: Artmed; 2010.

TEACHING STRATEGIES IN PERIOPERATIVE NURSING: A STUDENT ASSESSMENT

Estratégias de ensino em Enfermagem Perioperatória: uma avaliação discente

Estrategias de enseñanza en Enfermería Perioperatoria: una evaluación de los alumnos

Carina Aparecida Marosti Dessotte[1], Ana Sara Mendes Teixeira[2], Camila Daniela Amorim de Sousa[3], Helena Megumi Sonobe[4]

ABSTRACT: Objective: to describe the students' evaluation of two undergraduate Nursing courses on the teaching strategies used in the discipline of Perioperative Nursing, in a Public University in the state of São Paulo. **Method:** an exploratory and cross-sectional study was conducted with students who were enrolled in the discipline prior to data collection. An instrument was created for multiple choice, addressing the evaluation of block theory, laboratory practice and clinical practice. **Results:** the participants were 39 students. The majority of the subjects evaluated the theoretical block as "good" or "very good"; the laboratories of clinical practice were evaluated by the majority as "good" and "excellent"; and the activities of clinical practice, developed in surgical wards, post-anesthetic recovery and operating rooms were evaluated, in general, such as "very good". **Conclusion:** the teaching strategies used in the discipline of Perioperative Nursing were well evaluated by undergraduate students.

Keywords: Perioperative Nursing. Teaching. Evaluation.

RESUMO: Objetivo: descrever a avaliação dos alunos de dois cursos de graduação em Enfermagem sobre as estratégias de ensino utilizadas na disciplina de Enfermagem Perioperatória de uma universidade pública do interior paulista. **Método:** estudo exploratório, transversal, realizado com alunos que cursaram a disciplina previamente à coleta de dados. Foi criado um instrumento de múltipla escolha, abordando a avaliação do bloco teórico, práticas de laboratório e prática clínica. **Resultados:** participaram 39 alunos, sendo que a maioria avaliou o bloco teórico como "bom" ou "muito bom"; os laboratórios de prática clínica foram avaliados pela maioria como "bom" e "excelente"; e as atividades de prática clínica, desenvolvidas nas enfermarias cirúrgicas, recuperação pós-anestésica e salas de operação, foram avaliadas, no geral, como "muito bom". **Conclusão:** as estratégias de ensino utilizadas na disciplina de Enfermagem Perioperatória foram bem avaliadas pelos alunos de graduação.

Palavras-chave: Enfermagem perioperatória. Ensino. Avaliação.

RESUMEN: Objetivo: describir la evaluación de estudiantes universitarios de dos cursos de Enfermería en las estrategias de enseñanza que utilizan en la disciplina de Enfermería Perioperatoria, en una universidad pública del estado de São Paulo. **Método:** estudio exploratório, transversal, realizado con los estudiantes que se inscribieron en la disciplina previos a la recogida de datos. Creado un instrumento de elección múltiple para abordar la evaluación del bloque teoría, prácticas de laboratorio y práctica clínica. **Resultados:** los participantes fueron 39. La mayoría evaluados el bloque teórico como "buena" o "muy buena"; los laboratorios de la práctica clínica fueron evaluados por la mayoría de los casos como "buena" y "excelente", y las actividades de la práctica clínica, desarrollado en salas de cirugía, post-recuperación anestésica y se evaluaron las salas de operaciones, en general, como "muy bueno". **Conclusión:** las estrategias de enseñanza que utilizan en la disciplina de Enfermería Perioperatoria fueron bien evaluadas por los estudiantes.

Palabras clave: Enfermería Perioperatoria. Enseñanza. Evaluación.

[1]Nurse. Professor at the Department of General and Specialized Nursing of Escola de Enfermagem de Ribeirão Preto, Universidade de São Paulo (USP). E-mail: camarosti@usp.br
Avenida Bandeirantes, 3900, Campus Universitário, Monte Alegre, CEP: 14040-902, Ribeirão Preto (SP), Brasil. Telefones: (16) 3315-3410/(16) 3325-4057.
[2]Student in the fifth semester of the Bachelor's Degree Program in Nursing of Escola de Enfermagem de Ribeirão Preto da USP. E-mail: ana.sara.teixeira@usp.br
[3]Student in the tenth semester of the Bachelor's and Licentiate's Degree Program in Nursing of Escola de Enfermagem de Ribeirão Preto da USP. E-mail: camiladas@hotmail.com
[4]Nurse; Professor at the Department of General and Specialized Nursing of Escola de Enfermagem de Ribeirão Preto da USP. E-mail: megumi@eerp.usp.br
Received: 08 Oct. 2015 – Approved: 11 Nov. 2015.
DOI: 10.5327/Z1414-4425201500040002

INTRODUCTION

The nursing care to surgical patients demands new technical and scientific knowledge and interpersonal skills by graduates. The implementation of the new curriculum in Escola de Enfermagem de Ribeirão Preto of Universidade de São Paulo (EERP-USP) sought the improvement of the educational process to meet the demanding needs of students, their expectations, and the continuity the construction and improvement of their knowledge for their professional training[1,2].

The planning of teaching for the mobilization and building the expertise for professional training should be made considering the contents of each subject, choosing teaching and assessment strategies based on theoretical and methodological assumptions[3,4]. For the teaching of Perioperative Nursing, there is the need to mobilize knowledge already built by students plus new knowledge to advance the construction of a specific professional knowledge, such as understanding the biological and physical process, the anesthetic-surgical procedure and healing of surgical wounds.

The pedagogical proposal of EERP-USP aims at a competency-based and integrated curriculum, seeking to prepare generalist, humanist, critical and reflective nurses, able to mobilize multiple resources (knowledge, skills and attitudes) to handle complex situations of daily work, in line with the reorientation of the World Health Organization (WHO) for the training of health professionals. This is set out in the program's Pedagogical Political Project, whose fundamental axes are Primary Health Care; the Health-Disease/Care Process; and Work Process, pedagogical framework of competences and interdisciplinarity, subsidized by the ethical foundations, the teamwork, the humanization and the active and critical-reflective teaching strategies[5-9].

The teaching-learning process, through the teaching strategies in Perioperative Nursing, sought an approach that enables a more active learning from students, with the adoption of Meaningful Learning, with specific training of patient care, who needs full nursing care through the anesthetic-surgical procedure. Thus, the university becomes a place not only to acquire knowledge, but a place where more expanded experiences are built[10].

To implement this pedagogical framework, there is a need to provide teaching-learning opportunities and experiences in which students can concretely integrate theory to their learning demands, using strategies that promote this process. Thus, some questions motivated this study: have the teaching strategies used in the Perioperative Nursing subject favored the construction of knowledge that allows the development of scientific-technical and interpersonal skills of Nursing undergraduates? Are current teaching strategies appropriate to the needs of these students?

OBJECTIVE

This study aimed to describe the evaluation of undergraduate students of Undergraduate Programs in Nursing on the teaching strategies used in the Perioperative Nursing subject at EERP-USP.

METHOD

Study design

This is an exploratory, cross-sectional study.

Study location and participants

The study was conducted at EERP-USP. A consecutive and non-probabilistic sample was composed of students of Undergraduate Programs in Nursing, of both sexes, aged over 18, regardless of social class and race, and who attended classes on the Perioperative Nursing subject in 2013. The students of the Bachelor's Degree Program attended classes on the subject in the first semester of 2013, and students of the Bachelor's and Licentiate's Degree Program attended classes on the subject in the second semester of 2013. Data collection took place between May and December 2014. Participants completed questionnaires individually.

The research project was prepared in accordance with the ethical principles of National Health Council's Resolution no. 466 of December 2012 and was approved by the Research Ethics Committee of EERP-USP, under protocol no. CAAE 27214414.9.0000.5393. Each study

participant was duly informed about the research. The participants read the Informed Consent, which was signed by the participant and the researcher after consent to participate.

Data collection

For the sociodemographic characterization of the participants, an instrument containing the following data was created: date of the interview and birth date, to calculate the age in years; sex; Nursing course (Bachelor's or Bachelor's and Licentiate's Degree program); inclusion in health services, in the nursing staff, as assistants or technicians (yes or no).

Regarding the teaching strategies used in the subjects, activities consist of the theoretical block and the practical activities in the three scenarios that permeate the perioperative period: surgical wards for patient care in the mediate pre- and postoperative, post-anesthesia recovery for patients in the immediate postoperative period and surgical center for patient care during surgery.

In the theoretical block, consisting of 30 hours in both we used as teaching strategies expository classes on the following topics: "Anesthesia", "Adult and elderly patients in the perioperative period: physiological, cognitive and affective dimensions", "The surgical wound", "Infection prevention and control in surgical patients", "Hemodynamic Monitoring", "Hemotherapy", "The organization of Perioperative Nursing care", as well as clinical practice laboratories of the theoretical concepts developed on healing and removal of stitches, surgical wound; Central Venous Pressure (CVP) and nursing care for patients with stoma.

The practical activities block consists of 120 hours for the Bachelor's Degree program and 90 hours for the Bachelor's and Licentiate's Degree program. The workload is divided equitably among the three nursing work scenarios in the perioperative period: surgical wards, post-anesthesia and surgical center – operating rooms. At the end of each stage of the practical activities, students present a case study, based on the teaching method of the course, consisting of a five-stage pedagogical cycle:

1. Reality insertion (I) – a stage in which the student, from their experiences and knowledge acquired previously, performs data collection to know people's life story, aiming to identify priorities for the perioperative nursing care, reflecting on the learning process;
2. Provisional Synthesis (PS) – in group, a discussion and synthesis of the students' experiences in the medical field is performed by identifying the priorities for the development of skills and abilities in the planning of nursing care;
3. Search for information/knowledge (S) – in various sources, supporting the understanding of the issues regarding the planning of perioperative nursing care and preparation of the case study;
4. New synthesis (NS) – in a subgroup, presentation of the case study, with consideration of the information/knowledge brought by the students, aiming to understand the problems identified and give a new meaning to the professional practice;
5. Evaluation (E) – at the end of each activity, a self-assessment, a peer assessment and an evaluation of the teacher/lecturer are conducted.

To investigate the evaluation of the undergraduate students in the Bachelor's and Bachelor's and Licentiate's Degree programs in Nursing on the teaching strategies used in the Perioperative Nursing subject, an instrument was created specifically to meet the objective of this study, with the criteria already used for the program's evaluation after it ends, which contains the following data:

- assessment of the theoretical block – expository classes based on dialogue, covering: composition of themes; time spent for each class; dynamics of the classes; subsidy for the development of practical activities and references used/indicated.
- assessment of the theoretical block – clinical practice laboratories, covering: composition of clinical practice laboratories; time spent for each laboratory; dynamics of the activities developed in the laboratories; subsidy for the development of practical activities and references used/indicated.
- practical activity block – surgical wards, covering: interaction with patients; learning and experiencing the subject's concepts: surgical stress, wound, healing, hospital and rehabilitation; organization of time and planning of activities in the mediate

and/or late pre- and postoperative; duration of practical activity in the scenario; references used/indicated; preparation, presentation and discussion of the case study.

- practical activity block – surgical center/operating rooms, covering: interaction with the multidisciplinary team; learning and experiencing the subject's concepts: anesthesia, electrosurgery, surgical scrub and room preparation; organization of time and planning of activities during surgery; realization of preoperative visit; duration of practical activity in the scenario; references used/indicated; preparation, presentation and discussion of the case study.
- practical activity block – post-anesthetic recovery, covering: interaction with the patient; learning and experiencing the subject's concepts: anesthesia, preparation of the unit and patient admission, initial evaluation and systems and criteria for discharge/transfer of recovery; organization of time and planning of activities in the immediate postoperative period; duration of the practical activity in the scenario; references used/indicated; preparation, presentation and discussion of the case study.

To respond to each of the blocks, a five-point ordinal scale, like Likert's, was set up, in which (1) means bad, (2) regular, (3) good, (4) very good and (5) excellent. The evaluation of the results was obtained by the description of the frequencies found in each of the items.

Data processing and analysis

Data were first inserted in the Office Excel 2010® software with the technique of double entry of the responses received and subsequent validation. After the validation of the database, they were transferred to Statistical Package for the Social Sciences® (SPSS), version 17.0, for descriptive analysis of the study variables. Descriptive analyses of simple frequency were held for nominal or categorical variables, central tendency (mean and median) and dispersion (standard deviation – SD) for the continuous variables.

RESULTS

The number of students enrolled in the programs was 130 (80 from the Bachelor's Degree program and 50 from the Bachelor's and Licentiate's Degree program); 39 students participated in the study.

The sociodemographic characteristics of participants is shown in Table 1.

The average age of the participants was 25.13 years (SD=3.75), with a minimum of 21.3 and a maximum of 38.8 years.

Table 2 shows the students' evaluation of the dialogue-based expository classes.

It can be observed that most students evaluated the composition of the theoretical block, the duration of each class, the class dynamics and the subsidy that the classes offered for the development of practical activities as "good" or "very good". The references used and indicated on the classes were evaluated by most students as "very good" and "excellent".

Table 3 shows the students' evaluation of the clinical practice laboratories.

Students evaluated the composition of the clinical practice laboratories mostly as "good" and "excellent". The "dynamics of the activities developed in the laboratories" and "subsidy that laboratories provided for the development of practical activities" were evaluated as "good" and "very good" by the majority. The item "duration of each laboratory" was rated by most as "regular" and "good".

Tables 4 to 6 show the students' evaluations of the practical activities in the scenarios that permeate the perioperative period.

Table 1. Sociodemographic characteristics of the participants, according to the total sample (n=39). Ribeirão Preto, from May to December, 2014.

Variable	Total sample (n=39) n (%)
Sex	
Female	38 (97.4)
Undergraduate program in Nursing	
Bachelor's and Licentiate's Degree	24 (61.5)
Bachelor's Degree	15 (38.5)
Worked as a nursing assistant*	
No	33 (84.6)
Worked as a nursing technician**	
No	33 (84.6)

*Five participants did not respond; **Six participants did not respond.

Table 2. Evaluation of the dialogue-based theoretical classes, according to the total sample (n=39). Ribeirão Preto, from May to December, 2014.

Evaluation criteria	Bad n (%)	Regular n (%)	Good n (%)	Very good n (%)	Excellent n (%)
Composition of the topics of the theoretical block	0	3 (7.7)	13 (33.3)	17 (43.6)	6 (15.4)
Duration of each lesson	2 (5.1)	5 (12.8)	24 (61.5)	6 (15.4)	2 (5.1)
Dynamics of classes	2 (5.1)	5 (12.8)	18 (46.2)	11 (28.2)	3 (7.7)
Subsidy for the development of practical activities	2 (5.1)	5 (12.8)	18 (46.2)	8 (20.5)	6 (15.4)
Used and indicated references	0	0	9 (23.1)	15 (38.5)	15 (38.5)

Table 3. Evaluation of the clinical practice laboratories, included in the theoretical block, according to the total sample (n=39). Ribeirão Preto, from May to December, 2014.

Evaluation criteria	Bad n (%)	Regular n (%)	Good n (%)	Very good n (%)	Excellent n (%)
Composition of clinical practice laboratories	1 (2.6)	8 (20.5)	12 (30.8)	8 (20.5)	10 (25.6)
Duration of each laboratory	3 (7.7)	10 (25.6)	13 (33.3)	9 (23.1)	4 (10.3)
Dynamics of the activities developed in the laboratories	2 (5.1)	6 (15.4)	12 (30.8)	11 (28.2)	8 (20.5)
Subsidy for the development of practical activities	1 (2.6)	3 (7.7)	16 (41.0)	12 (30.8)	7 (17.9)
Used and indicated references	0	5 (12.8)	8 (20.5)	12 (30.8)	14 (35.9)

Table 4. Evaluation of the practical activities related to surgical wards, according to the total sample (n=39). Ribeirão Preto, from May to December, 2014.

Evaluation criteria	Bad n (%)	Regular n (%)	Good n (%)	Very good n (%)	Excellent n (%)
Interaction with patients	1 (2.6)	1 (2.6)	6 (15.4)	23 (59.0)	6 (15.4)
Learning and experiencing the concepts of the subject: surgical stress, surgical wound, healing, hospital release and rehabilitation	1 (2.6)	4 (10.3)	5 (12.8)	21 (53.8)	8 (20.5)
Organization of time and planning of activities in the mediate and/or late pre- and postoperative period	1 (2.6)	1 (2.6)	15 (38.5)	16 (41.0)	6 (15.4)
Duration of the practical activity in the scenario	2 (5.1)	5 (12.8)	13 (33.3)	15 (38.5)	4 (10.6)
Used and indicated references	0	0	11 (28.2)	17 (43.6)	11 (28.2)
Preparation, presentation and discussion of the case study	0	4 (10.6)	11 (28.2)	16 (41.0)	8 (20.5)

Table 5. Evaluation of activities related to the surgical center, according to the total sample (n=39). Ribeirão Preto, from May to December, 2014.

Evaluation criteria	Bad n (%)	Regular n (%)	Good n (%)	Very good n (%)	Excellent n (%)
Interaction with the multidisciplinary team	3 (7.7)	9 (23.1)	14 (35.9)	8 (20.5)	4 (10.3)
Learning and experiencing of the subject's concepts: anesthesia, electrosurgery, surgical scrub and organization of the room	0	3 (7.7)	14 (35.9)	10 (25.6)	12 (30.8)
Organization of time and planning of activities during surgery	2 (5.1)	2 (5.1)	20 (51.3)	10 (25.6)	5 (12.8)
Preoperative visit	3 (7.7)	4 (10.6)	15 (38.5)	10 (25.6)	7 (17.9)
Duration of the practical activity in the scenario	3 (7.7)	7 (17.9)	15 (38.5)	8 (20.5)	6 (15.4)
Used and indicated references	0	0	13 (33.3)	15 (38.5)	11 (28.2)
Preparation, presentation and discussion of the case study	0	1 (2.6)	13 (33.3)	15 (38.5)	10 (25.6)

Table 6. Evaluation of the practical activities related to post-anesthetic recovery, according to the total sample (n=39). Ribeirão Preto, from May to December, 2014.

Evaluation criteria	Bad n (%)	Regular n (%)	Good n (%)	Very good n (%)	Excellent n (%)
Interaction with the patient	1 (2.6)	4 (10.3)	12 (30.8)	14 (35.9)	8 (20.5)
Learning and experiencing the subject's concepts: anesthesia, patient preparation, initial assessment and systems, criteria for discharge/transfer of recovery	1 (2.6)	1 (2.6)	10 (25.6)	17 (43.6)	10 (25.6)
Organization of time and planning of activities in the immediate postoperative period	1 (2.6)	3 (7.7)	13 (33.3)	16 (41.0)	6 (15.4)
Duration of the practical activity in the scenario	2 (5.1)	7 (17.9)	13 (33.3)	11 (28.2)	6 (15.4)
Used and indicated references	0	0	8 (20.5)	19 (48.7)	12 (30.8)
Preparation, presentation and discussion of the case study	0	1 (2.6)	10 (25.6)	18 (46.2)	10 (25.6)

It was observed that the students rated as "very good", more often, all items related to practical activities developed in surgical wards.

Regarding the evaluation of activities conducted in the surgical center, the students rated as "good", more often, the interaction with the multidisciplinary team, learning and experiencing the concepts of the subject - anesthesia, electrosurgery, surgical scrub and preparation of the room, the organization of time and planning activities during surgery, performing the preoperative visit and the duration of the practical activity in the scenario. The items on the references used and indicated, as well as the preparation, presentation and discussion of the case study, were evaluated more often as "very good".

In the evaluations related to the practical activities in the post-anesthetic recovery period, the duration of the practical activity was assessed more frequently as "good", while all other items were assessed more frequently as "very good".

DISCUSSION

The teaching strategies used in the Perioperative Nursing subject were well evaluated by the students of the Bachelor's Degree and Bachelor's and Licentiate's Degree programs in Nursing. No similar studies were found in the literature, that is, which investigated the evaluation by students of the teaching strategies used in the program. However, we found studies that evaluated the evolution of Perioperative Nursing education in Nursing graduate programs in Brazil[10,11].

In one study, researchers evaluated the trends of the teaching of Perioperative Nursing care[10]. Teachers from ten undergraduate programs in Nursing, in the city and the metropolitan region of São Paulo, participated in the study in 2002. The researchers found that the theoretical workload in the surgical center varied between 30 (80%) and 72 hours (20%), and the practical workload, 60 (60%) and 90 hours (40%), similar to the workload in EERP-USP The theoretical contents on Perioperative Nursing care were addressed in a theoretical block in 70% of cases and, in 30% of cases, were addressed during the development of the subject. With regard to the practical activities on Perioperative Nursing care, 50% of the programs developed them during the surgical center stage.

Regarding the topics covered to support the teaching of Perioperative Nursing Care, were explicit in the objectives of the subjects evaluated in the study the intentions to identify, characterize and understand the physical and organizational aspects and the facilities of the Surgical Center (SC), Sterilized Material Center (SMC) and Post-anesthesia Recovery (PAR), as well as the types, stages and complications of anesthesia and surgery. Specifically as to the content, were identified the circulation of operating rooms; surgical instrumentation; antimicrobial procedures; the technical procedures for anesthesia, hemostasis, positions and instruments of the operating room; the effects surgical and anesthetic

trauma; surgical treatments; terminology; surgical time; antisepsis; the surgical environment; and recognition and reprocessing of materials[10].

Another study investigated how the operating room content is offered in 159 Brazilian institutions for undergraduate education in nursing. The average total workload of the course was 94.7 hours (SD=80 hours); average theoretical workload of 56.1 hours (SD=29.9) and average practice time of 42.3 hours (SD=33.2). The study also identified that, in 32.7% of the courses, there is no specific discipline that addresses the Perioperative Nursing – that content is dispersed into other subjects[11].

Based on these data, we consider relevant a discussion on the importance of this subject in the training of the generalist nurse. The Brazilian Curriculum Guidelines for Undergraduate Programs in Nursing[12] ensure freedom to higher education institutions in the composition of the workload for the completion of the curricula, causing a lack of specificity as to the skills and abilities that should make up the training of the generalist nurse[11].

We agree with the researchers' claim that, in an attempt to simultaneously comply with the minimum workload of the programs and health policies, some content, such as operating room, tend to be unsuccessful, as if it were less valuable in nursing education[13]. In addition, there is still not a consensus on the concept of the generalist nurse, and operating room-related content has been considered, in many programs, a specialty[13].

Faced with these questions, we found a study that aimed to know the opinion of nurses about the need for the Operating Room subject in undergraduate programs in Nursing to support the theoretical and practical knowledge in care. A total of 50 nurses from different areas were interviewed, divided into two groups: G1 consists of 25 nurses who had training in the perioperative subject, and G2 with 25 who did not have the subject. The results showed that 100% of the G1 nurses and 92% of G2 stated that this subject should be included in the curriculum because it allows the development of knowledge for a quality care, offering greater opportunity of operation. The authors also concluded that the exclusion of this discipline in some Nursing undergraduate curricula in Brazil left a gap in the Nursing education, leading to reconsider the inclusion in the curriculum[14].

We believe that the importance of the Perioperative Nursing subject in the Nursing programs is due to the fact that the student needs to understand that surgery is a crisis situation for the patient and family, regardless of the surgery classification, because there are always consequences that imply changes in the dynamics of the daily lives of these people, and new needs arise, requiring family, professional and social reorganization, with adequacy of the demands regarding the conditions and capabilities of the people involved. Patients perceive the risk of death, loss of organs, the financial losses, the discomfort from the hospital, family separation, suffering, pain and insecurity as real threats and, for the student, this experience is necessary to enable them to better handle these clinical situations.

In addition, we must consider that the technological advances in surgery, the complexity of care and the vulnerable state of the surgical patient require that the work of nurses in these areas is backed by clear knowledge of their performance and of the concept that our aim is to carry out perioperative assistance for the success of a safe surgical anesthesia[11].

We considered as limitations of this study the small number of students who participated in the survey. As we choose to interview them after the program, in a moment when they were already in their traineeship, we found it difficult to schedule appointments in person at the university, once the largest workload at this point is developed in the practical field. In addition, we also list as limiting the cross-sectional design. A reassessment of the teaching strategies used in the perioperative subject is important after these students graduate, when they will be active in the labor market.

CONCLUSION

The teaching strategies used in the Perioperative Nursing subject, made up of the theoretical block with dialogue-based expository classes and the development of clinical practice laboratories, as well as practical activities in the three scenarios that permeate the perioperative period, have been well evaluated by the majority of undergraduate students in the Bachelor's Degree and Bachelor's and Licentiate's Degree programs.

REFERENCES

1. Lopes ND, Teixeira E, Vale EG, Cunha FS, Xavier IM, Fernandes JD, et al. Um olhar sobre as avaliações de Cursos de Graduação em Enfermagem. Rev Bras Enferm. [Internet]. 2008 Feb [cited 2015 May 13];61(1):46-53. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672008000100007&lng=en

2. Smeltzer SC, Bare BG, Hinkle JK, Cheever KH. Tratado de enfermagem médico-cirúrgica. 12. ed. Rio de Janeiro: Guanabara Koogan; 2011.

3. Libaneo JC. Tendências pedagógicas na prática escolar. In: Libaneo JC. Democratização da escola pública: a pedagogia crítico-social dos conteúdos. São Paulo: Edições Loyola; 1984. p. 19-44.

4. Madeira MZA, Lima MGSB. A prática pedagógica das professoras de enfermagem e os saberes. Rev Bras Enferm. [Internet]. 2007 Aug [cited 2015 May 13];60(4):400-404. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672007000400008&lng=en

5. Deluiz N. O modelo das competências profissionais no mundo do trabalho e na educação: implicações para o currículo. Boletim Técnico do Senac. 2001;27(3):13-25.

6. Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo. Graduação. Bacharelado. Projeto Pedagógico. [Internet]. 2015 [cited 2015 March 16]. Available from: http://www.eerp.usp.br/

7. Escola de Enfermagem de Ribeirão Preto da Universidade de São Paulo. Graduação. Bacharelado e Licenciatura. Projeto Pedagógico. [Internet]. 2015 [cited 2015 March 16]. Available from: http://www.eerp.usp.br/

8. Mitre SM, Siqueira-Batista R, Mendonça JMC, Mendonça NMM, Meirelles CAB, Porto CP, et al. Metodologias ativas de ensino-aprendizagem na formação profissional em saúde: debates atuais. Ciênc Saúde Coletiva [Internet]. 2008 Dec [cited 2015 May 13];13(Suppl 2):2133-44. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232008000900018&lng=en

9. Saviani D. Pedagogia histórico-crítica: primeiras aproximações. 11. ed. Campinas: Autores Associados; 2011. 137 p.

10. Avelar MCQ, Silva A. Assistência de enfermagem perioperatória: ensino em cursos de enfermagem. Rev Esc Enferm USP. [Internet]. 2005 Mar [cited 2015 May 13];39(1):46-52. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342005000100006&lng=en

11. Turrini RNT. Ensino de Enfermagem em Centro Cirúrgico nos cursos de Bacharelado em Enfermagem no Brasil [dissertation]. São Paulo: Escola de Enfermagem da Universidade de São Paulo; 2012. Doctor of Medicine. Portuguese.

12. Brasil. Ministério da Educação; Conselho Nacional De Educação. Parecer CNE/CES 1133/2001. Dispõe sobre as Diretrizes Curriculares Nacionais dos Cursos de Graduação em Enfermagem. Diário Oficial da União, Brasília, 10 mar. 2001. Seção 1E. p.113.

13. Turrini RNT, Costa ALS, Peniche ACG, Bianchi ERF, Cianciarullo TI. Ensino de Enfermagem em Centro Cirúrgico: transformações da disciplina na Escola de Enfermagem da USP (Brasil). Rev Esc Enferm USP. [Internet]. 2012 Oct [cited 2015 May 13];46(5):1268-73. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0080-62342012000500032&lng=en

14. Paoli MD, Caregnato RCA, Milão LF. Repensar a disciplina de centro cirúrgico na formação do enfermeiro. Nursing (São Paulo). 2007;9(106):136-41.

MAPPING THE PROCESS OF REPROCESSING COTTON DRAPES

Mapeamento do processo de reprocessamento de campos cirúrgicos de tecido de algodão

Mapeo del proceso de lo reprocesamiento de campos de tejido de algodón

Mariana Fexina Tomé[1], Antônio Fernandes Costa Lima[2]

ABSTRACT: Objective: To map the process of reprocessing cotton drapes composing the surgical LAP packages. **Method:** Quantitative, exploratory, descriptive, single-case study conducted in the Clothing Service (SR) and Material and Sterilization Center (CME) at a teaching hospital. The whole process was followed up through non-participant observations at SR and CME and, later, meetings were held with representatives of the professional of SR (cleaners) and CME (nursing technicians and nursing assistants) aimed at detailing, completion and validation of the steps and activities observed. **Results:** Four stages regarding the reprocessing of cotton drapes were mapped and validated: processing of clothes by an outsourced laundry, entry of clothes in SR, putting together and sterilizing surgical LAP packages and storing them at CME. **Conclusion:** The mapping enabled the visualization of resources consumed in the process by providing information that will contribute to the rational allocation of resources.

Keywords: Protective clothing. Product packaging. Costs and cost analysis. Nursing.

RESUMO: Objetivo: Mapear o processo de reprocessamento de campos de tecido de algodão, duplos e simples, integrantes dos pacotes de LAP cirúrgico. **Método:** Estudo de caso exploratório, descritivo, conduzido no Serviço de Rouparia (SR) e no Centro de Material e Esterilização (CME) de um hospital de ensino. Acompanhou-se a condução de todo o processo por meio de observações não participantes no SR e no CME e, posteriormente, realizou-se reuniões com profissionais representantes do SR (camareiras) e do CME (auxiliares e técnicos de enfermagem), visando o detalhamento, complementação e validação das etapas e atividades observadas. **Resultados:** Foram mapeadas quatro etapas: processamento das roupas por lavanderia terceirizada, recepção das roupas no SR, montagem e esterilização dos pacotes de LAP e armazenamento dos pacotes de LAP no CME. **Conclusão:** O mapeamento possibilitou a visualização dos recursos consumidos nas etapas e atividades constituintes do processo, fornecendo informações que contribuirão para a alocação racional dos recursos envolvidos.

Palavras-chave: Roupa de proteção. Embalagem de produtos. Custos e análise de custo. Enfermagem.

RESUMEN: Objetivo: mapeo del proceso de reprocesamiento de campos de tejido de algodón componentes de paquetes de los LAP quirúrgicos. **Método:** Estudio de caso exploratorio y descriptivo realizado en el Servicio de ropa (SR) y en el Centro de Material y Esterilización (CME) en un hospital universitario. Fue observado todo el proceso en el SR y en el CME. Se celebraron reuniones con representantes de los profesionales de lo SR (camareras) y CME (técnicos y auxiliares de enfermería) destinadas a detallar, la conducción y validación de los pasos y las actividades observadas. **Resultados:** Se mapeó cuatro pasos: tratamiento de ropa para lavar la ropa subcontratada, la recepción de la ropa en SR, el montaje y esterilización de paquetes LAP y el almacenamiento de los paquetes de vuelta en la CME. **Conclusión:** El mapeo permite la visualización de los recursos que se consumen en el proceso al proporcionar informaciones que contribuyan a la asignación racional de los recursos implicados.

Palabras clave: Ropa de protección. Embalaje de productos. Costos y análisis de costo. Enfermería.

[1]Nurse. MD in Sciences, Nursing School of Universidade de São Paulo (USP). E-mail: mafeto21@hotmail.com
Rua Cláudio Manoel da Costa, 32, Jardim Faculdade. CEP: 18030-300. Sorocaba (SP), Brasil. Telefones: (15) 3212-9900.
[2]Nurse. Associate Professor, Department of Professional Orientation, Nursing School, USP. E-mail: tonifer@usp.br
Received: 14 Jul. 2015 – Approved: 20 Sep. 2015.
DOI: 10.5327/Z1414-4425201500040003

INTRODUCTION

Due to the complexity of the reprocessing of dental-medical assets (DMA), recently named by the Board Resolution – RDC 15/2012 as health products[1], there is, in most institutions, a great difficulty in determining the main processes to be monitored and how to track results. From this perspective it is necessary to plan and adapt the work at the Material and Sterilization Center (CME) as to the use of indicators for quality assessment[2].

The nurses who work at CME must know the different methods of sterilization and disinfection in order to develop monitoring measures to ensure the processing of health products and decrease the possibility of hospital infection[3]. They must master all activities integrating the workflow in order to monitor them and facilitate the improvement of the ones that add value to the final product and eliminate the unnecessary ones, notwithstanding the quality of the results intended.

It is therefore up to them the leadership of the nursing team, as well as rethinking the use of cleaning, disinfection and sterilization, opting for technologies that save water and energy, and reprocessable or recyclable packaging, considering the impact of inputs on the environment[4].

Among the health products processed by CME, we mention the woven cotton fabrics that usually make up a standard package with six double courses, a simple one and another for packaging, called surgical lap.

Most organizations use reprocessed surgical LAP packages as one of the important items of surgical apparel, whose amount varies according to profile, specificity and demand procedures. Reprocessing of tissue for the preparation of LAP packages is one of the duties of the CME, and it is shared with internal or outsourced laundry service, whose process must be well known to support efficient allocation of human, material and structural resources involved.

OBJECTIVE

To map steps and activities related to the reprocessing of double woven cotton fields and simple supplies of the surgical lap package.

METHODS

Single case, exploratory, descriptive study[5] conducted in a teaching hospital of Pontifícia Universidade de São Paulo (PUC-SP), in Sorocaba (SP), approved by the Research Ethics Committee (CAAE: 23028113.0.0000.5392, protocol 464023).

Case study is an empirical research that seeks to understand a contemporary phenomenon within its real context. It intends to grasp the totality of a situation, to describe, understand and interpret the complexity of a certain case from a closer and comprehensive perspective. Its planning logic incorporates specific approaches regarding data collection and analysis[5].

According to Yin[5], case study is a strategy that can be applied in evaluation research to explore situations in which the intervention being evaluated does not present well-defined results.

The Santa Lucinda Hospital (HSL) has a surgical profile and assists about 50 municipalities in the region, a total of 2.2 million inhabitants. Of the 146 beds available, 93 (63.7%) are intended for users of the National Health System (SUS), with an average of 700 surgeries performed per month in various specialties (orthopedics, general surgery, cardiology, esthetics, otolaryngology, ophthalmology, urology, etc.). Its structure comprises Ambulatory Medical Specialties, CME, Cardiology and Interventional Radiology Center, Adult Intensive Care Unit (ICU), Neonatal ICU, Surgical Center (SC), Obstetrics Center (OC), Maternity, Pediatrics, Dialysis and Renal Transplantation Center, Coronary Care Unit, Lithotripsy, Medical and Surgical Clinic.

The CME, continuously operating, performs cleaning processes, disinfection and sterilization of health products, targeting the supply of Units/Services of the HSL. Its area consists of a dressing room, office, staging area, purge, sterilization room and sterile equipment area. It has two ultrasonic washers, one washer-disinfector, three pre-vacuum autoclaves and a low-temperature hydrogen peroxide plasma sterilizer. The professional staff comprises a Nurse Coordinator (from 7 a.m. to 4 p.m.), a nurse (from 3 p.m. to 9 p.m.), 18 nursing technicians and 3 nursing assistants distributed to ensure proper operation across all periods (morning, afternoon and night).

The flow of products is continuous: they are received in the receiving and cleaning area (purge), then go to the preparation and sterilization area (clean area), and finally to the storage area (sterile area). Areas are bounded by physical barriers in order to prevent the clean pieces from being in contact with contaminated pieces.

The Clothing Service controls incoming and outgoing clothes, collection of dirty laundry, receipt of clothing

processed in outsourced laundry and supply of all units and services. The service is composed of a Supervisor and eight chambermaids.

To map the process of reprocessing double and simple cotton fields from the surgical lap, steps adopted in previous studies were taken[6,7].

Data collection began when the hospital maids, nursing auxiliary and technicians agreed to participate in the study by signing the Informed Consent and Informed.

RESULTS

To map the steps of surgical fields reprocessing, non-participative observations of all professionals working in the SR and CME were made, and then meetings were held with professionals of the different scenario — morning, afternoon and night periods (odd and even) —, for detailing, completion and validation of the steps and activities observed.

Four maids who had been working for a longer period (one year and six months) in the Clothing Service participated in the meetings, as well as seven nursing assistants and technicians with long experience in CME — two professionals with more than 18 years of experience, one with more than seven years, two with more than five years, and two with more than two years of experience.

After the double and single Cotton Fields are used, they are discarded in collectors and store bags in the purge of Unit/Center to be collected by a CS employee. An outsourced laundry is responsible for the removal, processing and return of the clothes to SR.

In the end of the procedure, in the surgery center or other unit/service of the hospital, all components of the open surgical LAP package are discarded in collector bags placed in the purge room, to be collected by an SR employee.

The collector bags are taken from the purge room to an area for storing dirty clothes until they are removed by an outsourced laundry. The outsourced laundry is responsible for removing daily the dirty clothes, weighing, washing, ironing, folding and returning them to SR. The hospital pays the service according to the weight of clothes processed.

Upon delivery to the SR, the clothes are barcode controlled, separated by type (private clothes, aprons, fields, sheets, blankets, jumpers, towels), counted and stored in cabinets with dividers. The SR staff assembles the clothing cars based on the established quota for each unit/service, and proceeds to supply.

In CME, the clothing car is received in the clean area. To begin the assemblage process of surgical LAP packages, nurses separate the recommended amount of surgical drapes (six double fields, a single field and a double for packing), revise the folds, remaking them when not properly made. They put a chemical integrator between the third and the fourth field, finish the package with masking and autoclave tapes.

Then the LAP packages are labeled with a permanent marker (name of who performed the procedure, date and remarks) and the label of traceability, then arranged in the autoclave carts; after that, they are discriminated in the printed sterilization control and processed in the pre-vacuum autoclave. Each autoclave sterilization cycle holds a surgical-grade packaging containing a chemical integrator used as a parameter for load release.

Routinely, the Bowie Dick test is conducted in all three autoclaves. Biological indicators are placed in the second load of the day and all loads with implantable materials sterilized within 24 hours. After sterilization, a nursing professional wearing a cap and protective thermal insulation gloves unloads the autoclave and stores the LAP packages on specific shelves.

The CME assembles and performs the sterilization of 40–60 LAP packages a day, targeting the supply of units/sectors according to their surgical demands.

To better understand the steps of surgical fields reprocessing, the flow chart shown in Figure 1 was assembled.

DISCUSSION

The processes of health organizations require evaluation and control as to effectiveness, efficacy, production, productivity and quality, as issues related to costs have important implications in service delivery. Restraints are made necessary so that there is compliance with a larger number of customers using the non-abundant resources available[8].

Studies performed in Brazil to map different processes (admission process of nursing technicians, training programs in CPR and process of disinfection and sterilization of hospital-medical assets) have showed that mapping makes it possible to better visualize resources consumed and hence lead to optimization[6,7,9].

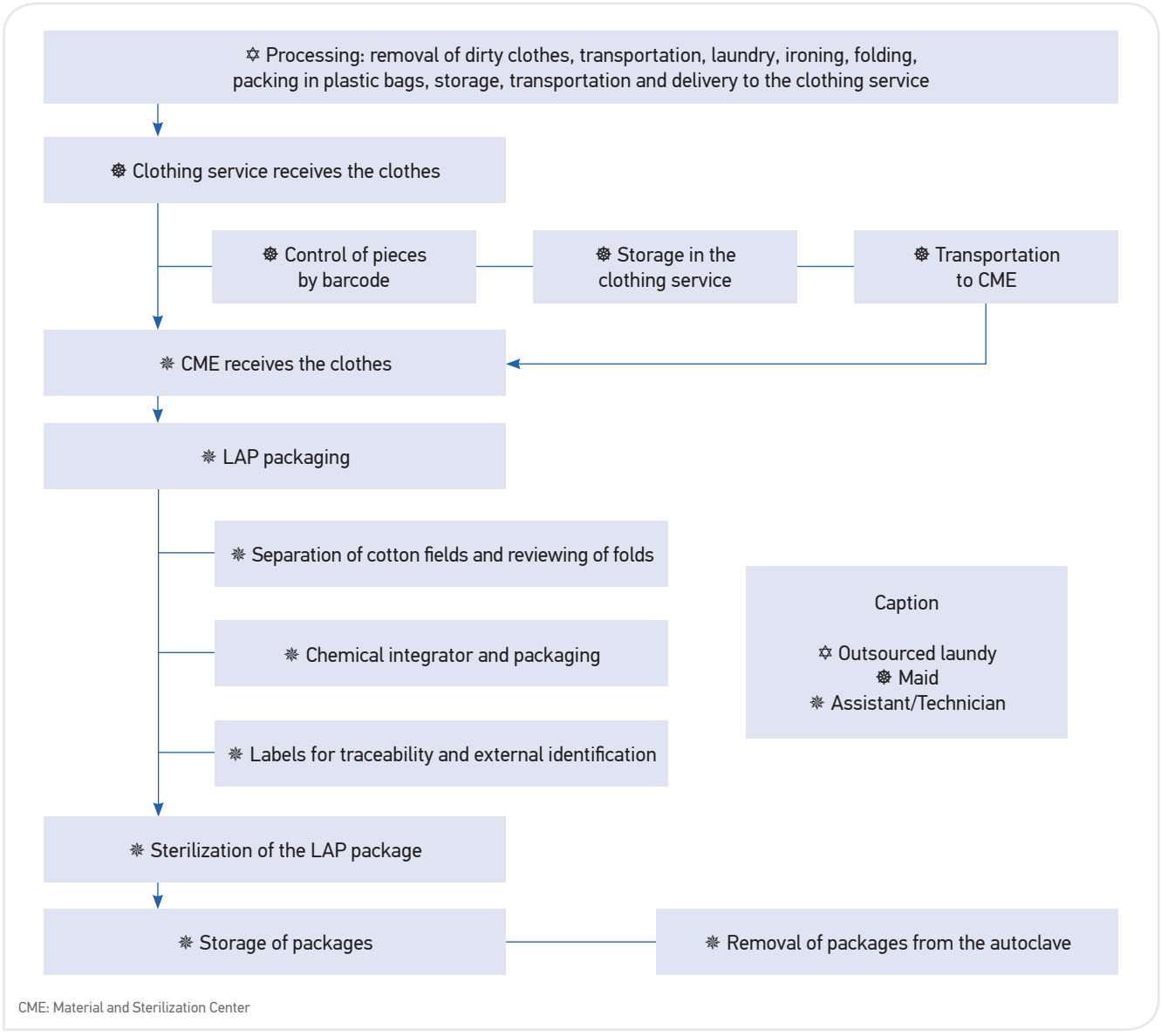


Figure 1. Flowchart of activities involved in cotton fields reprocessing. São Paulo, 2014.

In the context of CME, analyzing the cause-effect relationship in activities of the implementation process and resource consumption, and identifying how these activities influence costs will monitor the process and allow improvement of the management practice[9].

Knowing the steps of cotton fields reprocessing in the HSL by mapping made it possible to propose some improvements for the preparation of LAP packages. For example, their assemblage should be assigned to the clothing service staff, which already happens in other institutions.

Considering that quality should always be linked to low costs and high productivity[8], such a change would allow nursing Technicians / Assistants to perform more specific and complex activities at the CME, reducing personnel costs in the assemblage of LAP packages.

Direct observation, non participative, allowed us to recognize some of the difficulties of the clothing service maids in activities involved in surgical fields reprocessing.

Upon removal of pieces from the sealed plastic bags and input control through the bar code reader, some assets lost their barcode label. As all pieces had also its barcode number manually transcribed on the fabric, the maids would control it by entering that number in the collector, increasing the time taken for this activity.

It is suggested that the Coordination of HSL monitor this activity for a longer period and inquire the maids of management propositions for this occurrence in order to draw alternative solutions that reduce the time spent improperly and costs associated.

In private entities, unnecessary expenses for the preparation of a good or service refer to the increase of resources for business survival. Due to fierce competition, they need to do more with fewer resources in order to attract and retain customers who end up becoming more demanding, requiring high-quality products at a lower price[10].

Whatever the nature of the health organization is, public or private, the waste represented by unnecessary resources spent on production processes, products and services for customer support aggravates the difficulties arising from limited resources, thus requiring the adoption of mitigating measures[11].

Both administrators and users of the public health services have been more and more concerned with the high costs of health, with the difficulty of funding it, and with the impact of costs on the service quality[12]. Thus, hospitals need to take on the challenge of maintaining high levels of quality, requiring effectiveness and efficacy in costs related to the quality of service and customer satisfaction[12].

CONCLUSION

Achieving this single-case study enabled the mapping of the steps and activities related to the reprocessing of double and single Cotton fields composing surgical LAP packages used in a teaching hospital. It allowed a better view of resources consumed in the process by providing information that will contribute to a rational allocation of resources involved.

The methodology adopted allows the in-depth identification of a process and can be reproduced in other public and private hospitals to map different processes, aiming at improvement and better performance of resources consumed.

REFERENCES

1. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária (ANVISA). Resolução da Diretoria Colegiada - RDC nº 15, de 15 de março de 2012. Dispõe sobre requisitos de boas práticas para o processamento de produtos para a saúde e dá outras providências. Brasília: Ministério da Saúde; 2012.
2. Calicchio LG, Santos FP, Silva CPR. Indicadores de monitoramento em Centro de Material e Esterilização. In: Leão ER, Silva CPR, Alvarenga DC, Mendonça SHF. Qualidade em saúde e indicadores como ferramenta de gestão. São Caetano do Sul: Yendis; 2008. p.281-93.
3. Brito MFP, Galvão CM, Françolin L, Rotta SG. Validation of the sterilization process of medical and hospital devices according to different packaging types. Rev Bras Enferm. 2002;55(4):414-9.
4. Psaltikidis EM. Desafios atuais e futuros para a Central de Materiais e Esterilização. [citado 2013 abril 04]. Disponível em: http://www.nascecme.com.br/artigos/Desafios%20atuais%20e%20futuros%20para%20a%20CME%20-%20final.pdf
5. Yin RK. Estudo de caso: planejamento e método. 4ª ed. Porto Alegre: Bookman; 2010.
6. Okano HIH, Castilho V. Survey on the cost of the admission process of nursing technicians in a teaching hospital. Rev Esc Enferm USP. 2007;41(3):492-9.
7. Follador NN, Castilho V. The direct cost of the cardiopulmonary resuscitation training program in a university hospital. Rev Esc Enferm USP. 2007;41(1):90-6.
8. Bittar O. J. N. V. Gestão de processos e certificação para qualidade em saúde. Rev Assoc Med Bras. 2000;46(1):70-6.
9. Jerico MC, Castilho V. Cost management: the implementation of the activity-based costing method in central sterilizing services. Rev Esc Enferm USP. 2010;44(3):745-52.
10. Castilho V, Castro LC, Couto AT, Maia FOM, Sasaki NY, Nomura FH, et al. Survey of the major sources of waste in the health care units of a teaching hospital. Rev Esc Enferm USP. 2011;45(n.esp):1613-20.
11. Dias LNS, Matias-Pereira J, Farias MRS, Pamplona VMS. Factors associated with the waste of health resources allocated by the Federal Government to the Municipalities audited by the Office of the Comptroller General. Rev Contab Finanç. 2013;24(63):206-18.
12. Schutz V, Siqueira BT. A enfermagem e o custo com os materiais hospitalares: uma revisão bibliográfica. Cogitare Enferm. 2011;16(1):148-53.
13. Bonacim CAG, Araujo AMP. Cost management applied to public university hospitals: the experience of the Ribeirão Preto Medical School Clinics Hospital of the University of São Paulo. Rev Adm Pública. 2010;44(4):903-31.

ANALYSIS OF ADVERSE EVENTS IN AN OUTPATIENT SURGICAL CENTER

Análise de eventos adversos em um Centro Cirúrgico ambulatorial

Análisis de eventos adversos en un centro de Cirugía Ambulatoria

Flávia Giendruczak da Silva[1], Nery José de Oliveira Junior[2], Dionísia Oliveira de Oliveira[3], Diana Rodrigues Nicoletti[4], Emily Comin[5]

ABSTRACT: Objective: To analyze the adverse events reported in the Surgical Center for patient safety. **Method:** This is a documentary retrospective study to investigate the reporting of adverse events happened in a private outpatient Surgery Center. **Results:** Through the Epidemiology Service and Risk Management (SEGER), the survey data for the year 2014 were collected, with 250 event notifications as results. **Conclusion:** Through the survey, it was found a deficiency in the notification and recognition process by the professionals of the institution in face of situations of adverse events or failures in the care process.

Keywords: Patient safety. Operating room nursing. Perioperative care.

RESUMO: Objetivo: Analisar os eventos adversos notificados no Centro Cirúrgico para a segurança do paciente. **Método:** Trata-se de um estudo documental retrospectivo para investigar as notificações dos eventos adversos acontecidos em um Centro Cirúrgico ambulatorial privado. **Resultados:** Por meio do Serviço de Epidemiologia e Gerenciamento de Risco (SEGER), foram coletados os dados da pesquisa, durante o ano de 2014, tendo como resultados 250 notificações de eventos. **Conclusão:** Mediante a pesquisa constatou-se uma deficiência no processo de notificação e reconhecimento pelos profissionais da instituição diante das situações de eventos adversos ou falhas no processo de cuidados.

Palavras-chave: Segurança do paciente. Enfermagem de centro cirúrgico. Cuidados perioperatórios.

RESUMEN: Objetivo: Analizar los eventos adversos reportados en la Sala de Operaciones para la seguridad del paciente. **Método:** Se trata de un estudio retrospectivo documental para investigar los informes de eventos adversos ocurrió en un Centro De Cirugía ambulatoria privada. **Resultados:** A través del Servicio de Epidemiología y Gestión de Riesgos (SEGER) se recogieron los datos de la encuesta para el año 2014, con los resultados de 250 notificaciones de eventos. **Conclusión:** A través de la encuesta era una deficiencia en el proceso de notificación y reconocimiento por parte de los profesionales de la institución frente a situaciones de eventos adversos o fallas en el proceso de atención.

Palabras clave: Seguridad del paciente. Enfermería del quirófano. Cuidados perioperatorios.

[1]Nurse. Specialist in Surgical Center. Nurse in the Operation Room of the Hospital Moinhos de Vento. E-mail: flavia_gsilva@yahoo.com.br
[2]Nurse. Master in Nursing by the Federal University of Rio Grande do Sul (UFRGS). Technical Responsible Nurse of the Hospital Giovanni Battista, Sistema de Saúde Mãe de Deus. Professor in the Faculdade de Desenvolvimento do Rio Grande do Sul (FADERGS). E-mail: nery.oliveirajr@gmail.com
Avenida Jacuí, 638/311, Cristal, 90810-150, Porto Alegre (RS), Brasil. Telefone: (51) 3378-9919
[3]Nurse. Specialist in Health Management and Infection Control. Nurse in the Infection Control and Risk Management of the Hospital Giovanni Battista, Sistema de Saúde Mãe de Deus. E-mail: dionisia.oliveira@maededeus.com.br
[4]Student of the Nursing course in the Centro Universitário Ritter dos Reis. E-mail: diana.nicoletti@hotmail.com
[5]Student of the Nursing course in the Centro Universitário Metodista of IPA. E-mail: emilycomin@hotmail.com
Received: 09 Nov. 2015 – Approved: 23 Nov. 2015.
DOI: 10.5327/Z1414-4425201500040004

INTRODUCTION

The Surgical Center (SC), due to its complexity, demands a different perspective on patient care, working with different professionals and the integration of multiple units. Their specificity needs attention in the processes surrounding the patient. Based on this premise, it is understood the activity in the SC involves complex tasks, full of changes and uncertainty, carried out under ambient conditions dominated by pressure and stress. Therefore, these activities require extra professional attention in the processes involving the patient[1].

In this context, we may emphasize the many surgeries carried out daily, explaining the safety of the patient in the perioperative preparation. The hospital environment has many health risks to the patients, which may lead to the worsening of the recovery process. Therefore, it is considered an important role of the professional in the identification of factors which may affect the safety of the patient and the evaluation of prevention measures to the exposure to risks and damages caused by the care service[2].

The hospitals are increasingly concerned about ensuring a quality of care to their clients. In this context, the safety of the patient, through risk management, has been highlighted with the implementation of prevention measures to the exposure to risks, as well as the damages to the client due to health care assistance[3]. Therefore, the team must be alert to the activities developed to that one may avoid mistakes caused by lack of preparation and lack of attention during patient's care.

Studies show that the scientific and technological advances have increased every year, generating a greater number of surgical procedures, having a direct impact in the occurrence of adverse events[4]. In this context, it is arguable the importance of safety in relation to the adverse events which may be caused during the assistance of the health teams, being necessary to review measures for the prevention of damages and risks to the health of the patient[5]. Many of the adverse events caused by the Nursing staff are due to errors of medication, falls of patients, extubation, Burns during the procedure, bleeding by disconnection of drains and others, however several studies are being made for the evaluation of services and the protocols used in the institutions[6].

Some limitations still persist despite the studies previously made, being necessary to evaluate the notifications made before the unpreparedness and absence of knowledge of many professionals.

The concern about the safety of the patient has been a subject much discussed by hospitals. The care given by the professionals is increasingly complex, requiring technical and scientific knowledge and specific skills for each case. Based on the above, the following questioning is made: which are the adverse events more often reported in the surgical center?

This study aimed at evaluating the safety of the patient before adverse events in the surgical Center, pointing out the possible causes for them, and evaluating the knowledge of professionals in the notification of errors made by the staff working in the surgical centers.

OBJECTIVE

To analyze the adverse effects notified in the Surgical Center for the safety of the patient.

METHOD

It is a retrospective documentary study in order to investigate the notifications of the adverse events in a private outpatient Surgical Center in the city of Porto Alegre. The research project was approved by the Research Ethics Committee of the *Hospital Mãe de Deus* under No. 035820/2015 and CAAE 44507515.3.0000.5328.

The hospital has 170 employees, 90 of which are employees of Nursing, and their main strategy is the outpatient Surgical Center. Besides the surgical Center (Surgical Center and Post-Anesthetic Care Unit), the institution offers hemodialysis and Oncology services. The Surgical Center has 8 operating rooms, in which are carried out, approximately, 800 monthly surgeries, and the cosmetic procedures represent 80% of the surgical production, followed by traumatology surgeries, among other low-complexity ones.

Data collection was carried out by the database service, consulting the notification platform, making an analysis based on the quality and coherence of the data. The notification of the events is made by an anonymous reporting system (Appendix 1), via intranet, which is open to all levels of organization. These notifications are registered in a platform to which the Epidemiology Service and Risk Management (SEGER) gives continuity to the treatment of notifications, with the instrument of quality and the cause-effect analysis

(Ishikawa Diagram) and the plan of action. The SEGER and the computerized notification system of adverse events exist in the institution since 2012.

In this system, there is a specific notification instrument for each of the adverse event occurred or technical complaint to be notified. In order to fill it out, it is not necessary a previous registration, and only the risk management team has access to the information.

The hospital classifies their notifications into:

- technical complaint – any suspicion of modification, irregularity, malfunction of a product and/or material related to technical or legal aspects and which may or may not cause damage to individual or collective health;
- almost failure – any variation in the process which does not affect the outcome, but whose recurrence results in a significant chance of a several adverse event;
- process error – an event which is not consistent with the routine of care or procedures of the hospital;
- medication error – any unintentional act in the process of prescription, dispensing, transcription or administration of a drug or medication;
- adverse event – are unwanted incidents, therapeutic problems, iatrogenic damage or any unadverted occurrence directly associated with caring or services provided in the jurisdiction of a health care establishment. As a possible result of deliberate or omission acts, there are;
- sentinel event – an unexpected occurrence involving death or several damage, both physical and psychological, or the risk arising from it.

Several damage refers to, specifically, the loss of an organ or function. The expression "or the risk resulting from this" includes any variation in the process to which a recurrence may lead to a significant chance of severe adverse event[7,8].

Among their classifications, the hospital defines as an adverse event the notifications on: bacteremia, medication error, extravasations, phlebitis, fall, removal of catheter, pressure ulcers (PU), adverse reaction, cardiac arrest (CA), hyperglycemia, severe hypoglycemia, adverse event itself. The other events are classified into: process error, technical complaint and almost failure.

There were included and analyzed all the complete records of incidents reported on the platform of institutional recording in the period from January to December 2014. The exclusion criteria were the notifications performed with incorrect filling out or inconsistency to the subject.

The data were analyzed according to the number of notification, the reason of the report, the professional category and the quality of the information. The data collected were stored in an electronic database and submitted to a Microsoft Excel spreadsheet, version 2010, statistically analyzed and presented in absolute and relative frequencies.

RESULTS

The SEGER of the institution is active and is responsible for receiving all notifications registered in the platform and for following up and treating them. In 2014, the institution hosted 6,186 procedures of cosmetic and curative purposes.

In 2014, it was performed the registration of 250 notifications of these in the institution, 90 (36%) of them were registered by the Surgical Center and 19% (n=17) of them were considered adverse events. The occurrence of adverse events in the SC in the studied period was 2.8% (n=17/6,186).

In Table 1, it is observed the frequency of adverse events (n=17) and he administrative occurrences (n=73). As for the kind, it was verified that the highest number of notifications — 40% (n=36) of the total — is related to the process error (failure in the follow-up of the routine, protocols),

Table 1. Distribution of administrative notifications and adverse events in the notification platform, according to the type. Porto Alegre, 2014.

Administrative notifications / adverse events	Frequency	%
Process error	36	40
Technical complaint	34	37.8
Adverse event	7	7.8
Medication error	5	5.6
Almost failure	3	3.3
Adverse reaction	2	2.2
Phlebitis	1	1.1
Fall	1	1.1
Pressure Ulcer	1	1.1
Total	90	100

followed by technical complaints related to suspected modification, irregularity and/or malfunction of a product and/or material in 37.8% (n=34), adverse event related to the patient themselves in 7.8% (n=7), medication error in 5.6% (n=5) and almost failure in 3.3% (n=3). Only 2% of the notifications is related to falls (one case) and phlebitis (one case).

In March, after conducting institutional capacitation regarding the notification of adverse effects, it was observed an increased number of notifications to 45% (n=45), being 18% of them performed by the SC (Figure 1). The month with the lowest number of notifications related to the SC was July. On average, there were 7.5% of the notifications, and this is the month with the highest demand for labor, considered as the high season.

In Figure 1, it is registered a number of total notified events in the platform comparing the number of notified events to the Surgical Center in the period of the study. The notifications related to adverse events were the slightest when compared to the process errors, for which there were identified the highest one for notifications.

As for the highest number of notified events, it was identified the process error (40%). From these errors, the highest prevalence was the patterns related to Nursing – 63.9% (n=23), followed by doctors – 27.8% (n=10) and administrative – 8.4% (n=3). Of the total of events, 37.8% are related to the technical complaint, especially about prevalent problems in the refrigeration environment (n=28), followed by equipments (n=6), which need annual preventive maintenance.

As for the adverse events related to the patient themselves, there were five cases, two of which were Burns caused by electrocautery. As for the medication errors, they were related to errors in the prescription of medications in two cases, followed by more than three occurrences in the administration of those. The greatest evidences of failure were related to identification errors (missing identification bracelet, inappropriate identification). Regarding the adverse reaction, there were two occurrences of skin reaction. Among the cases in which there was one occurrence: UP level I, by the poor positioning in a long-duration surgery; followed by a phlebitis level I and a fall in the recovery room due to the patient not following the instructions given by Nursing. It is worth to mention the there was no fall to the ground, but a difference in height instead, with no damage.

DISCUSSION

The data suggests there has been underreporting and that it may be related to the lack of knowledge by the professionals in relation to the consequences which may affect the patient

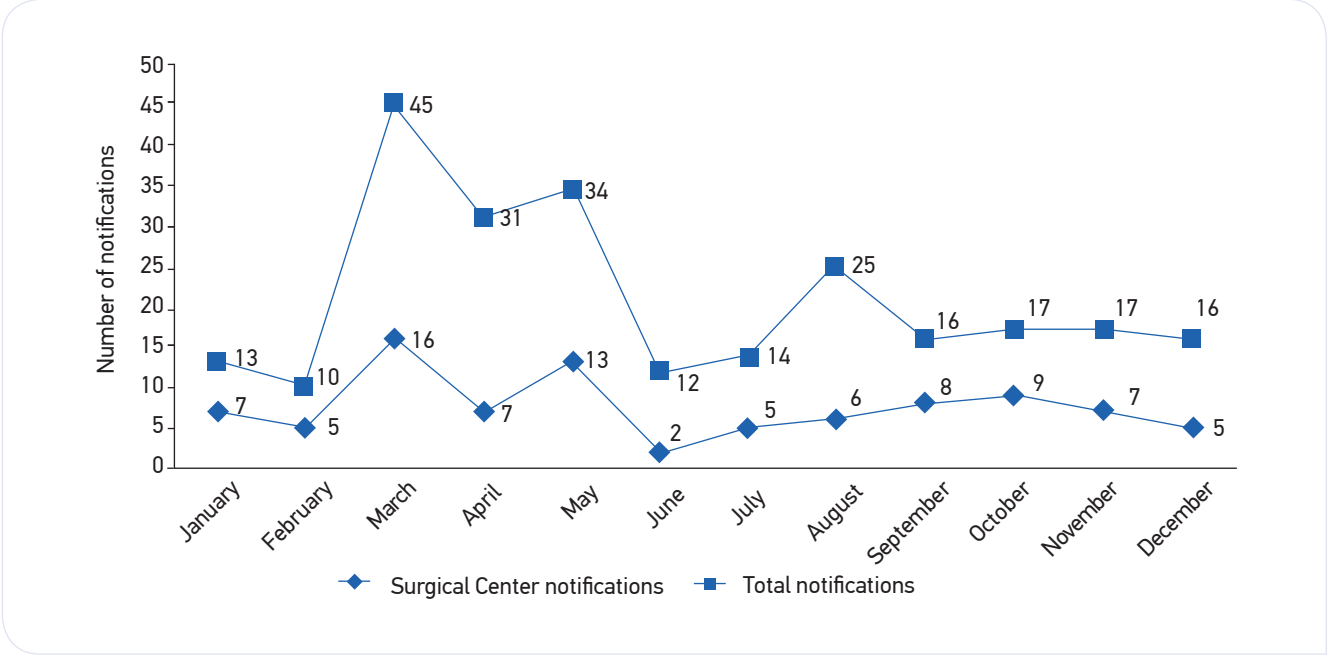


Figure 1. Number of notifications in the Surgical Center and the total number of notifications in the period from January to December 2014.

and the fear of punishment by the institution. Some of the many reasons leading professionals to not reporting incidents are based on feelings such as shame, self-punishment, fear of criticism from other people and litigation. The institution must encourage participation actions and appreciation of the professionals developing a non-punitive culture, but educational actions instead[9].

The notification is considered a practical means of communication, which provides the institution with knowledge on unexpected and unwanted facts, enabling the building of a database and the execution of modifications and the planning of safer processes, allowing the prevention from future adverse events.

The act notifications by professionals must be continuously encouraged, considering that its analysis affects the prevention of these events, being important that they recognize the error as a flaw in the process and not a form of suppression, but instead a way of supporting the planning of strategies which minimize their occurrence and/or avoid new mistakes.

In relation to the number of notifications registered, the greatest number of registers occurred in months when there was professional training on the subject, and the lowest records occurred during high season, months in which the professionals increase their work demand. In health services, the educational processes must be continuous and with defined objectives, in an attempt to directly fulfill the needs of the both the institutions and the professionals. The Perioperative Nursing team must go through trainings of effective and continuous skills, in addition to simulations[4,10].

As for the most common occurrence of notifications, the errors in processes related to the non-compliance of routines and institutional patterns by the Nursing, doctors and administrative professionals, it was highlighted the absence of continuous education in order to meet the needs in the assistencial process within the period studied, besides the integration of new professionals.

Followed by the notifications relates to the technical complaints regarding refrigeration, it was observed that, in the period studied, the institution was having great problems related to the corrective maintenance of the equipments, which, after the renovation of the whole climatization system, presents a significant improvement.

As for the main occurrence of adverse events directly involving the patient, there were identified Burns caused by improper use of the electrocautery. The risk of burns due to the use of the electrocautery may be associated to the placement of the neutral plate, as well as to bad electrical installations. Due to this condition, one of the main intentions of a security program in hospitals must be the comprehensive training regarding the use of powered medical equipments[7], besides the preventive maintenance of the devices, in order to avoid any bad wiring which may lead to health risk of assistencial teams, corroborating the safety of the surgical patient.

There was a case of fall notified during the period studied, which meets what occurs during professional practice, considering the pre- and postoperative period have greater risk of falls than the perioperative period. The fall may be explained by inadequate monitoring of patients with no conditions of wandering off alone or by the non-adherence to the instructions given by the Nursing team.

Studies show that the fall is the most common adverse event among hospitalized patients, totaling about 70% of the accidents which occur within the hospital. The risk factors are present mainly in clients hospitalized in surgical units, which evidences the need of increasing monitoring of patients who require postoperative assistance. Some measure may be taken in order to avoid falls, such as high railings on the beds, among other preventive actions[11].

The vents related to medication errors refer to the prescription and administration of medical drugs. In the hospital context, usually, Nursing is responsible for these errors since such practices are present in their routine. However, medication error is a professional matter, not limited to only one professional category. The work overload, the medical prescription and the incorrect identification of patients are factors most commonly involved in medication errors[12].

Pressure ulcers occurred in one single case; it was identified after the end of a long-term procedure, highlighting the poor positioning of the patient. The nurse along with the anesthesiologist and the surgical team decide which is the best position to place the patient on the operating table, considering the scientific knowledge of the anatomical and physiological alterations of the patient, associated to the kind of anesthesia, the kind of procedure and length of the surgery to which they will be submitted, so that the positioning is appropriate and it does not result in postoperative complciations[4,13].

In relation to phlebitis, there was just one reported case in the SR, classified as level I. Despite the low incidence of phlebitis in the institution, it is important to reinforce that it is considered a intravenous therapy (IVT) complication directly related to Nursing care, therefore educational and qualification

actions are necessary for the Nursing team regarding IVT specificities, especially regarding the early detection of phlebitis[14].

The notification of adverse events in the SEGER platform are essential to the process of health assistance, since they portray a documented fact, in addition to ensuring the effective communication reality between the assistencial team and health managers, providing legal support and, consequently, working for the patient's safety.

Given the above, there must be a commitment on the part of health professionals when reporting an event occurred in a detailed way, avoiding subnotification, since the records can reliably contribute for educational chances and corroborate better assistencial results. The results found in this research show that, for the management of adverse events, it is necessary the commitment of all health professionals, in order to build awareness about the importance of the notifications and their responsibilities, ensuring the safety of the patient and the quality of the service.

CONCLUSION

The present research concluded that the number of notifications have risen from the workers' training, in addition to being an stimulus, reinforcing the importance of the records of events for the improvement of the assitencial process.

In relation to the limitations of the notified data, it was verified that the records were related to the routines and the institutional patterns, with higher notification in technical areas, showing a lower result regarding the adverse events or failures in the perioperative period. We understand that the notifications must be stimulated and monitored by the Epidemiology and Risk Management service based on the results presented during the year.

The correct and complete Record of the adverse event contributes for the development of a plan of action in the surgical field; however, when the Record is scarce and/or inappropriate, it compromises the care given to the patient, as well as the analysis of the event by the service managing the notifications.

In order to have a cohesive Record, it is necessary to monitor the notifications and results in the quality of care in the outpatient surgical area, as well as to stimulate the records by the professionals in the perioperative period, in order to prevent adverse events and to reinforce the safety of the patient.

REFERENCES

1. Lima AM, Sousa CS, Cunha ALSM. Segurança do paciente e montagem de sala operatória: estudo de reflexão. Rev Enferm UFPE on line. 2013;7(1):289-94 [acesso em 2015 set 08]. Disponível em: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/download/4047/5522

2. Oliveira Jr NJ. Segurança do paciente: o checklist da cirurgia segura em um centro cirúrgico ambulatorial [dissertação]. Porto Alegre: Universidade Federal do Rio Grande do Sul; 2015. [acesso em 2015 ago 20]. Disponível em: http://www.bibliotecadigital.ufrgs.br/da.php?nrb=000965823&loc=2015&l=1f2b9de8b7a025a7

3. Fassini P, Hahn GV. Riscos à segurança do paciente em unidade de internação hospitalar: concepções da equipe de enfermagem. Rev Enferm UFSM. 2012;2(2):290-9 [acesso em 2015 ago 20]. Disponível em: http://cascavel.ufsm.br/revistas/ojs-2.2.2/index.php/reufsm/article/view/4966/3753

4. Grigoleto ARL, Avelar MCQ. Posicionamento cirúrgico de clientes submetidos à cirurgia de quadril: eventos adversos. Rev SOBECC. 2012;17(1):27-34.

5. Grigoleto ARL, Gimenes FRE, Avelar MCQ. Segurança do cliente e as ações frente ao procedimento cirúrgico. Rev Enferm UFPE on line. 2011;13(2):347-54 [acesso em 2015 jul 17]. Disponível em: https://www.fen.ufg.br/fen_revista/v13/n2/v13n2a22.htm

6. Capucho HC, Arnas ER, Cassiani SHBD. Segurança do paciente: comparação entre notificações voluntárias manuscritas e informatizadas sobre incidentes em saúde. Rev Gaúcha Enferm. 2013;34(1):164-72 [acesso em 2015 set 03]. Disponível em: http://seer.ufrgs.br/index.php/RevistaGauchadeEnfermagem/article/view/26538/24527

7. World Health Organization. World Alliance for Patient Safety. Global Patient Safety Challenge: 2005-2006. [Internet]. 2005. [acesso em 2015 nov 17]. Disponível em: http://www.who.int/patientsafety/events/05/GPSC_Launch_ENGLISH_FINAL.pdf

8. Agência Nacional de Vigilância Sanitária - ANVISA. Diretrizes para o Gerenciamento do Risco em Farmacovigilância. [Internet]. 2008. [acesso em 2015 nov 17]. Disponível em: http://portal.anvisa.gov.br/wps/wcm/connect/8236f400446ae386a886fd9a09637ab4/Farmaco+4_final.pdf?MOD=AJPERES

9. Souza LP, Bezerra ALQ, Silva AEBC. Eventos adversos: instrumento de avaliação do desempenho em centro cirúrgico de um hospital universitário. Rev. Enferm UERJ. 2011;19(1):127-33 [acesso em 2015 set 27]. Disponível em: http://www.facenf.uerj.br/v19n1/v19n1a21.pdf

10. Lipira LE, Gallagher TH. Disclosure of adverse events and errors in surgical care: challenges and strategies for improvement. World J Surg. 2014;38:1614-21 [cited 2015 Aug 15]. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24763441

11. Carneiro FS, Bezerra ALQ, Silva AEBC, Souza LP, Paranaguá TTB, Branquinho NCSS. Eventos adversos em uma clínica cirúrgica de uma Hospital Universitário: Instrumento de avaliação da qualidade. Rev Enferm UERJ. 2011;19(2):204-11 [acesso em 2015 ago 15]. Disponível em: http://www.facenf.uerj.br/v19n2/v19n2a06.pdf

12. Corbellini VL, Schilling MCL, Frantz SF, Godinho TG, Urbanetto JS. Eventos adversos relacionados a medicamentos: percepção de técnicos e auxiliares de enfermagem. Rev Bras Enferm. 2011;64(2):241-7 [acesso em 2015 set 02]. Disponível em: http://www.scielo.br/pdf/reben/v64n2/a04v64n2.pdf

13. Lopes CMM, Galvão CM. Posicionamento cirúrgico: evidências para o cuidado de enfermagem. Rev. Latino-Am. Enfermagem [online]. 2010;18(2):287-94 [acesso em 2015 Ago 07]. Disponível em: http://www.scielo.br/pdf/rlae/v18n2/pt_21.pdf

14. Magerote NP, Lima MHM, Silva JB, Correia MDL, Secoli SR. Associação entre flebite e retirada de cateteres intravenosos periféricos. Texto Contexto - Enferm. 2011;20(3):486-92 [acesso em 2015 set 10]. Disponível em: http://www.scielo.br/pdf/tce/v20n3/09.pdf

Appendix 1. Data collection instrument.

ELECTIVE SURGERIES: CANCELLATIONS AND CAUSES

Cirurgias eletivas: cancelamentos e causas

Cirugías electivas: cancelaciones y causas

Naraiamma Oliveira Botazini[1], Lucas Dionísio Toledo[2], Diba Maria Sebba Tosta Souza[3]

ABSTRACT: Objective: To investigate the number of cancelled elective surgeries and to identify its causes. **Methods**: A descriptive, exploratory, prospective and quantitative study was conducted in a university hospital using data from scheduled and cancelled elective surgeries in the period from April to June 2014, which were extracted from TASY System and the Statistical and Medial File Service. **Results**: 1,699 elective surgeries were scheduled during three months, of which 466 (27.4%) were cancelled. 336 (72.1%) cancellations occurred in the morning; and patients of the Brazilian Unified Health System had 384 (29.2%) surgeries cancelled of the 1,314 scheduled ones. The Proctology sector had 22 cancelled surgeries (43.1%) of 51 scheduled, and Orthopedics had 133 (38.3%) of 347. The main reason for cancellation was "surgeon's criterion", seen in 264 cases (56.7%). **Conclusion**: The number of cancellations was high, and the detailed causes were not identified because the records do not specifically report the reason for cancellation.

Keywords: Perioperative nursing. Perioperative care. Quality indicators, health care. Hospital administration. Hospitals, teaching.

RESUMO: Objetivo: Investigar o número de cirurgias eletivas que são canceladas e identificar as suas causas. **Métodos**: Estudo descritivo, exploratório, prospectivo e quantitativo, realizado em um hospital universitário utilizando os dados de cirurgias eletivas agendadas e canceladas no período de abril a junho de 2014, extraídos do Sistema TASY e do Serviço de Arquivo Médico e Estatística. **Resultados**: Durante três meses, foram agendadas 1.699 cirurgias eletivas, das quais 466 (27,4%) foram canceladas. O turno matutino foi responsável por 336 (72,1%) não realizações, e os pacientes do Sistema Único de Saúde tiveram 384 (29,2%) cirurgias canceladas dentre 1.314 agendadas. O setor de Proctologia teve 22 canceladas (43,1%), dentre 51 agendadas, enquanto a Ortopedia teve 133 (38,3%), dentre 347. O principal motivo dos cancelamentos foi "a critério do cirurgião", observado em 264 casos (56,7%). **Conclusão**: O número de suspensões foi alto e as causas detalhadas não foram identificadas, pois os registros não informam de forma específica o motivo do cancelamento.

Palavras-chave: Enfermagem perioperatória. Assistência perioperatória. Indicadores de qualidade em assistência à saúde. Administração hospitalar. Hospitais de ensino.

RESUMEN: Objetivo: Investigar el número de cirugías electivas que se cancelan e identificar las suyas causas. **Métodos**: Estudio descriptivo, exploratorio, prospectivo y cuantitativo, realizado en un hospital universitario utilizando los datos de cirugías electivas programadas y canceladas en el período entre abril hasta junio del 2014, extraídos de lo sistema TASY y del Servicio de Archivo Médico y Estadística. **Resultados**: Por tres meses, se programaron 1.699 cirugías electivas, de las cuales 466 (27,4%) fueron canceladas. El turno de la mañana representó 336 (72,1%) cancelaciones, y los pacientes del Sistema Único de Salud de Brasil tenían 384 (29,2%) cirugías canceladas entre 1.314 programadas. El sector de Proctología tuvo 22 (43,1%) de sus 51 procedimientos cancelados y el Ortopedia tuvo 133 (38,3%) de los 347. El principal motivo de la cancelación fue el "criterio del cirujano", observado en 264 casos (56,7%). **Conclusión**: El número de cancelaciones fue alto y las suyas causas detalladas no fueran identificadas porque los registros no informan específicamente el motivo de cancelación.

Palabras clave: Enfermería perioperatoria. Atención perioperativa. Indicadores de calidad de la atención de salud. Administración hospitalaria. Hospitales escuela.

[1]Post-graduate student of Nursing in a Center of Surgery, Anesthetic Recovery and Center of Material and Sterilization at Albert Einstein – Instituto Israelita de Ensino e Pesquisa; Nurse graduated at the School of Health Sciences "Doutor José Antônio Garcia Coutinho", Universidade do Vale do Sapucaí (Univás). E-mail: naraiamma@hotmail.com
Rua Joaquim Lopes da Costa, 21 – CEP: 37550-000 – Pouso Alegre (MG), Brasil – Telefone: (35) 99959-5458.
[2]Student of Chemical Engineering at the School of Engineering of Lorena, Universidade de São Paulo (EEL-USP). E-mail: lucasdtoledo@hotmail.com
[3]PhD in Sciences at the Postgraduate Program of Plastic Surgery at Universidade Federal de São Paulo (Unifesp); Professor at the Masters of Sciences Applied to Health and the Nursing and Pharmacy courses at Univás. E-mail: dibasouz@uai.com.br
Received: 08 Sep. 2015 – Approved: 20 Oct. 2015.
DOI: 10.5327/Z1414-4425201500040005

INTRODUCTION

The word surgery can be defined as the field of Medicine that aims at studying and developing activities in order to care for and treat internal and external changes, to keep the quality of life of the patient[1,2].

Surgeries can be classified as to the level of contamination, the time, the size and the medical specialty. Those considered to be less aggressive to the patient and not deep are minor. Those conducted frequently, lasting for a few hours, are medium; and the major surgeries require special equipment or more than one team, and usually last long hours[1,2].

In the process of organizing surgical planning, the nurse is the professional skilled to manage the preoperative needs, while preparing the patient. This person should identify the infections before the elective surgeries and communicate the doctor when finding a focus of infection[3].

The structure of the surgery program to be carried out is conducted by a nurse one day before the surgery. The team in charge should issue a previous surgery note. The information in this note is inserted in a data base and is used in the preparation of these surgeries by the teams of anesthesia, nurses, surgeons, laboratories, centers of material, sterilization and blood. The cancellation may occur if surgeons, anesthesiologists, nurses or patients request it[4].

Among the possibilities of structural organization, it is possible to find both the coordinator and the assistant nurse. The former has several jobs, and is in charge of keeping the administrative, technical, operational and ethical controls in the activities of the Surgery Center; of providing the human and material resources to perform the surgeries; of conducting the strategic planning of the Nursing department; of scheduling in a specific map and guiding the setup of the rooms. The latter should check the surgery schedules previously, supervise the work of the professionals of the Nursing team and make the shifts of the daily activities of the employees. The schedule of the surgeries is organized by the administrative assistant[3].

When a patient who will be submitted to an anesthetic-surgical procedure is admitted to the institution, a process of nursing assistance begins, and that does not depend on the characteristics involving the admission or the intervention: emergency or urgent surgeries, elective operations, emergency care or hospital admission[2].

The role of the nurse in terms of planning and managing the routine of the Surgery Center is mentioned by authors who defend technological improvements in surgery schedules and the need for all suspended surgeries to be rescheduled for the same day or week[4].

It is also important to know the method used to schedule surgeries in the analyzed hospital, so that it is possible to find errors coming from such a procedure[5].

There are many consequences when surgeries are cancelled. There are changes in the routine of the patient and the family, because after they are informed of the need to go through surgery, everyone needs to rethink their activities to adjust to this new event. Besides, there are changes regarding hospital administration, which provides time and material resources to conduct both the cancellation and the new schedule, when necessary[5]. The costs of these events are also considerable, so, the concern with this matter is justified[6].

It is important to observe the reasons to cancel the procedures, especially in the specialties in which this event is more frequent. For that, nurses should study these data and present them to the board in order to reduce such rates[7].

Among the reasons to cancel surgeries, the absence of patients on the scheduled day is analyzed by some authors[8]. Suspensions caused by errors in schedule are also discussed, and can be prevented by better planning. The same authors point out to the need for an infrastructure that supports the collection of reliable data, which can be used by the Nursing department for better planning[8].

Some of the changes proposed to minimize the suspension of surgeries are: confirmation of the schedule prior to the surgery; control and investigation of the reasons for suspension, besides periodical meetings to discuss and plan future surgeries[9].

Some researchers recommend other actions to minimize the number of cancellations[10]. Some of them are: pre-op visit, besides the improved communication between institution and users; confirmation of the date of surgery on the days close to the procedure; visit to the hospital before the anesthesia; control of indicators to manage problems; creation of study groups to provide better and more humanized care[10].

In the university hospital of this study, it was possible to observe frequent cancellations of surgeries, and these were not analyzed statistically to identify the specialties and the reasons for cancellation. Knowing the consequences of this phenomenon, it was chosen to conduct a study to verify,

quantitatively, the occurrences of these events, and specially their causes.

OBJECTIVES

To investigate the number of scheduled elective surgeries that are cancelled and identify the causes.

METHODS

This is a descriptive, exploratory and prospective study with a quantitative approach. It was conducted in a university hospital with the TASY System and *Serviço de Arquivo Médico e Estatística* (SAME), in the south of Minas Gerais. The unity of the Surgery Center is comprised of seven operation rooms, and there minor, medium and major surgeries are conducted in several specialties, every month. This institution cares for hospitalized patients or those admitted at outpatient surgery. The surgery schedule is established from 7 a.m. to 7 p.m., every day, from Monday to Friday, and on Saturdays in the morning. Night, weekends and holidays are used in cases of urgency and emergency.

The University Hospital is classified by the Ministry of Education (MEC) and by the Ministry of Health (MS) as a General Teaching Hospital, according to ordinance 450, from March 23, 2005, including secondary and tertiary levels of complexity. There are 264 hospital beds in the following specialties: Medical Clinic, General Surgery, Cardiology, Endocrinology, Gastroenterology, Gynecology, Obstetrics, Nephrology, Urology, Neurology, Neurosurgery, Ophthalmology, Orthopedics/Traumatology, Otorhinolaryngology, Plastic, Thoracic surgeries, Intensive Care Units (ICU), Pediatrics and Adult, out of which 231 are destined to the Unified Health System (SUS)[11]. The organization is highly resolute in procedures of medium and high complexity, being considered as a secondary and tertiary reference in the macro-region of the South of Minas Gerais for more than 53 cities, with an estimated population of 1,000,000 inhabitants, according to the last census. The number of SUS patients is always increasing. The hospital is the only one with a general emergency room in the region that is part of the reference system in urgency, emergency and elective services, for pregnant women with high risk (level III); high complexity (Neurosurgery, level II), Traumatology/Ortopedics; complexity in cornea and kidney transplant; Adult, Neonatal and Pediatric ICU (type II) and cardiac surgeries[11].

The sample was comprised of information from the System TASY, including patients who had elective surgeries scheduled and canceled from April to June, 2014, accounting for 1,699 scheduled operations and 466 canceled ones.

The inclusion criteria were scheduled and cancelled elective surgeries registered in the TASY system, and non-inclusion criteria contemplated urgency and emergency surgeries, as well as C-sections and deliveries.

This study was conducted in accordance with resolution 466/12, which guides investigations with human beings and keeps their anonymity. It was approved in report 642,997, from April 30, 2014, by the Research Ethics Committee of the university. The data recorded in TASY were collected, with the evaluation of the surgical procedures conducted on a daily basis. This information was stored in a specific form that had two parts: the first included sociodemographic data, and the second, information regarding the surgical procedure.

The data were analyzed by descriptive statistics, with absolute and relative numbers, using statistical tools. The results were organized in tables and graphs, which were inserted in Excel – Microsoft Office® 2013.

RESULTS

The hospital had 1,699 elective surgeries scheduled in the three months, from April to June, 2014, of which 466 (27.4%) were canceled. The analysis of data regarding the scheduled and canceled procedures was made per month, and the results are presented in Table 1.

In the total period of the study, out of 808 surgeries scheduled for male patients, 223 (27.6%) were cancelled; and of 888 for female patients, the total of suspensions was 240 (27.0%). Some surgeries in the records of cancellation had blank or incorrect information about the patient. These data were classified in the sex category as "Unidentified".

The surgeries scheduled for 1 p.m. and later were in the afternoon shift. There were 1,154 surgeries in the morning, and out of these, 336 (29.1%) were cancelled; among the 545 surgeries scheduled for the afternoon, 130 (23.9%) were cancelled.

After analyzing the day chosen for each surgery in the total period, the following was observed: on Monday, 343

Table 1. Scheduled and cancelled surgeries according to sex, shift, week day, health insurance and clinical specialty in April, May and June, 2014.

Categories	April			May			June			Total		
	Sc	Can	%	Sc	Can	%	Sc	Can	%	Sc	Can	%
Surgeries	581	150	25.8	579	154	26.6	539	162	30.1	1699	466	27.4
Sex												
Male	293	71	24.2	250	66	26.4	265	86	32.5	808	223	27.6
Female	288	79	27.4	327	86	26.3	273	75	27.5	888	240	27.0
Unidentified	0	0	-	2	2	100	1	1	100	3	3	100
Shift												
Morning	383	101	26.4	377	105	27.9	394	130	33.0	1154	336	29.1
Afternoon	198	49	24.7	202	49	24.3	145	32	22.1	545	130	23.9
Week day												
Monday	96	29	30.2	125	30	24.0	122	29	23.8	343	88	25.7
Tuesday	151	37	24.5	117	30	25.6	124	42	33.9	392	109	27.8
Wednesday	132	32	24.2	120	25	20.8	102	27	26.5	354	84	23.7
Thursday	128	42	32.8	130	45	34.6	96	33	34.4	354	120	33.9
Friday	74	10	13.5	87	24	27.6	95	31	32.6	256	65	25.4
Health insurance plan												
Unified Health System	460	130	28.3	455	130	28.6	399	124	31.1	1314	384	29.2
Insurance	85	14	16.5	80	9	11.3	78	13	16.7	243	36	14.8
Private	25	2	8.0	24	3	12.5	19	3	15.8	68	8	11.8
Unidentified	11	4	36.4	20	12	60.0	43	22	51.2	74	38	51.4
Clinical specialty												
Proctology	21	7	33.3	14	6	42.9	16	9	56.3	51	22	43.1
Orthopedics	127	49	38.6	107	41	38.3	113	43	38.1	347	133	38.3
Urology	30	9	30.0	29	12	41.4	34	13	38.2	93	34	36.6
General Surgery	76	19	25.0	59	21	35.6	51	18	35.3	186	58	31.2
Odontology	8	4	50.0	14	3	21.4	9	2	22.2	31	9	29.0
Otorhinolaryngology	13	3	23.1	15	3	20.0	26	9	34.6	54	15	27.8
Neurology	88	19	21.6	56	19	33.9	69	21	30.4	213	59	27.7
Plastic surgery	60	16	26.7	81	22	27.2	59	13	22.0	200	51	25.5
Gynecology	41	11	26.8	58	5	8.6	28	7	25.0	127	23	18.1
Cardiology	34	4	11.8	32	5	15.6	35	9	25.7	101	18	17.8
Pediatrics	16	3	18.8	18	3	16.7	14	2	14.3	48	8	16.7
Vascular	32	2	6.3	65	11	16.9	45	10	22.2	142	23	16.2
Ophthalmology	14	1	7.1	15	3	20.0	15	3	20.0	44	7	15.9
Oncology	21	3	14.3	16	0	0	25	3	12.0	62	6	9.7

Sc: scheduled; Can: cancelled.

scheduled operations and 88 (25.7%) cancellations; on Tuesday, 392 scheduled surgeries and 109 (27.8%) cancellations; on Wednesday, of the 354 scheduled operations, 84 (23.7%) were suspended; on Thursday, from 354 surgeries, 120 (33.9%) were cancelled; and of the 256 on Friday, 65 (25.4%) were cancelled.

Among the 1,314 surgeries scheduled for SUS patients, 384 (29.2%) were cancelled, whereas those who were admitted by the private system had 68 surgeries scheduled, out of which 8 (11.8%) were cancelled. People who were hospitalized by some kind of medical insurance had higher rates than the latter: of 243 scheduled surgeries, 36 (14.8%) were cancelled.

Regarding specialties, there was a major variation both in the number of surgeries and in the percentage of cancellations. Proctology and Orthopedics had the highest rates of cancellation in the period, with 51 scheduled procedures and 22 cancelled ones (43.1%), and 347 scheduled surgeries and 133 (38.3%) cancellations, respectively; for Urology, out of 93 scheduled operations, 34 (36.6%) procedures were suspended. Oncology had the lowest rate, scheduling 62 procedures and cancelling 6 (9.7%).

The 466 surgeries that were cancelled were analyzed as to the reason of cancellation and divided in the same categories observed previously. The result is in Table 2.

The number of cancellations in April, May and June was of 150 (32.2%), 154 (33.0%) and 162 (34.8%), respectively. In the analysis by sex, 233 (47.9%) cancellations involved male patients, whereas 240 (51.5%) were of female patients. The other three (0.6%) were of patients who were not identified as to sex. The morning shift was in charge of 336 (72.1%) cancellations. Regarding the day of the week, Friday corresponds to a total of 65 (13.9%) suspensions, whereas Thursday represents 120 (25.8%) cancellations. SUS was in charge of 384

Table 2. Distribution of scheduled and cancelled surgeries in April, May and June, 2014.

Categories	April		May		June		Total	
	n	%	n	%	n	%	n	%
Cancelled surgeries	150	32.2	154	33.0	162	34.8	466	100
Sex								
Male	71	47.3	66	42.9	86	53.1	223	47.9
Female	79	52.7	86	55.8	75	46.3	240	51.5
Unidentified	0	0	2	1.3	1	0.6	3	0.6
Shift								
Morning	101	67.3	105	68.2	130	80.2	336	72.1
Afternoon	49	32.7	49	31.8	32	19.8	130	27.9
Week day								
Monday	29	19.3	30	19.5	29	17.9	88	18.9
Tuesday	37	24.7	30	19.5	42	25.9	109	23.4
Wednesday	32	21.3	25	16.2	27	16.7	84	18.0
Thursday	42	28.0	45	29.2	33	20.4	120	25.8
Friday	10	6.7	24	15.6	31	19.1	65	13.9
Health insurance plan								
Unified Health System	130	86.7	130	84.4	124	76.5	384	82.4
Insurance	14	9.3	9	5.8	13	8.0	36	7.7
Private	2	1.3	3	1.9	3	1.9	8	1.7
Unidentified	4	2.7	12	7.8	22	13.6	38	8.2

Continue...

Tabela 2. Continuation.

Categories	April		May		June		Total	
	n	%	n	%	n	%	n	%
Clinical specialty								
Proctology	49	32.7	41	26.6	43	26.5	133	28.5
Orthopedics	19	12.7	19	12.3	21	13.0	59	12.7
Urology	19	12.7	21	13.6	18	11.1	58	12.4
General Surgery	16	10.7	22	14.3	13	8.0	51	10.9
Odontology	9	6.0	12	7.8	13	8.0	34	7.3
Otorhinolaryngology	11	7.3	5	3.2	7	4.3	23	4.9
Neurology	2	1.3	11	7.1	10	6.2	23	4.9
Plastic surgery	7	4.7	6	3.9	9	5.6	22	4.7
Gynecology	4	2.7	5	3.2	9	5.6	18	3.9
Cardiology	3	2.0	3	1.9	9	5.6	15	3.2
Pediatrics	4	2.7	3	1.9	2	1.2	9	1.9
Vascular	3	2.0	3	1.9	2	1.2	8	1.7
Ophthalmology	1	0.7	3	1.9	3	1.9	7	1.5
Oncology	3	2.0	0	0.0	3	1.9	6	1.3
Reason for cancellation								
Surgeon's criterion	84	56.0	95	61.7	85	52.5	264	56.7
Lack of hospital beds	23	15.3	21	13.6	23	14.2	67	14.4
Non-attendance	19	12.7	18	11.7	29	17.9	66	14.2
Lack of bed in Intensive Care Unit	3	2.0	5	3.2	8	4.9	16	3.4
Surgery has already been performed	4	2.7	4	2.6	3	1.9	11	2.4
Unfavorable clinical condition	3	2.0	5	3.2	2	1.2	10	2.1
Error in schedule	3	2.0	2	1.3	5	3.1	10	2.1
Surgery rescheduled	3	2.0	0	0.0	4	2.5	7	1.5
Procedure suspended	2	1.3	1	0.6	1	0.6	4	0.9
Not specified	1	0.7	1	0.6	1	0.6	3	0.6
Lack of fasting	1	0.7	1	0.6	0	0.0	2	0.4
Patient died	0	0.0	1	0.6	1	0.6	2	0.4
Refusal to perform surgery	1	0.7	0	0.0	0	0.0	1	0.2
Lack of material	1	0.7	0	0.0	0	0.0	1	0.2
Anesthetist's criterion	1	0.7	0	0.0	0	0.0	1	0.2
Not authorized by insurance	1	0.7	0	0.0	0	0.0	1	0.2

(82.4%) of cancellations, and private surgeries represented 8 (1.7%) of the total in the period. Surgeries from insurance companies accounted for 36 (7.7%) and those without health insurance in the records were 38 (8.2%).

A total of 14 clinical specialties was analyzed. Orthopedics had a total of 133 (28.5%) cancelled procedures in the period, followed by Neurology, with 59 (12.7%). Oncology had fewer cancellations, 6 (1.3%).

The most frequent reason for cancellation was "the surgeon's criterion", being 264 (56.7%) in the period, followed by "lack of hospital beds", with 67 (14.4%) and "non-attendance", with 66 (14.2%).

DISCUSSION

The 27.4% rate of cancellations found in the analyzed period is high. Similar studies indicated values between 5.1[6] and 39.3%[12]. In this last investigation, a system was implemented to reduce this high rate, and, after a second analysis, the percentage was 15.9. Other investigations also found rates of 11.4[13], 16[5], 17[7] and 17.3%[4].

In the collection period, the three months had similar numbers of scheduled surgeries. However, June had a higher rate of cancellation in relation to the other months: 30.1% of the surgeries were cancelled.

Regarding sex, the cancellation rates were close for both genders. Even though there were differences between the months alone, in the final analysis they were compensated and the values were close. This result is compatible with other studies that did not find big differences in this distribution, when cancellations among men were 45 and 58.7%[14]. However, there is a difference in relation to another study, in which female people presented 83.3% of cancellations[15].

The cancellation rate of the morning shift (72.1%) was higher than the afternoon. Because of that, the number of surgeries scheduled for the morning (1,154) was almost twice as high in relation to those scheduled for the afternoon (545). Similar data were found, reporting that cancellations in the morning were also more frequent, accounting for 76.3%[8], whereas, in another study, 77.8% of cancellations took place in the afternoon[15]. This difference between values can be attributed to the different ways each institution manages its surgeries per clinical specialties in the analyzed periods.

In the analysis per weekday, Thursdays had higher cancellation rates in every month of evaluation. The lowest rate was found on Fridays, Wednesdays and Mondays, in April, May and June, respectively. In the distribution of cancellations, Thursdays were responsible for the highest value (25.8%), whereas Friday had the lowest one (13.9%). This is owed to the fact that the number of surgeries scheduled for that day was lower in two of the three analyzed months. In a study with a sample of 18 cancelled surgeries, 82.2% of them had been suspended on a Thursday[15], whereas in another one, Wednesdays had more cancellations, 24.1%, and the lowest number, except for Saturday, was on Tuesday (15.2%)[8]. As in the analysis per shifts, these results may have been influenced by the variation in the distribution of specialties on weekdays in different institutions.

SUS had the highest rates of cancellation (29.2%), in comparison to surgeries performed by insurance companies (14.8%). With high rates of cancellation and high number of surgeries performed by this system, it represents 82.4% of all cancellations. This result is also found in studies showing that 82.7, 73.1 and 61.67% of cancellations were attributed to patients from SUS[6,8,9].

The highest rate of cancellation was found in surgeries of Proctology (43.1%), followed by Orthopedics, with the second highest rate of cancellation (38.3%). This result is similar to that found in analyses in which Orthopedics also had the second highest rate, with 36.4 and 26.2%[7,14], and another one in which this specialty presented 27.8% of the cancelled procedures[16]. Urology, which, in this study, had the third highest rate, was higher in another study, with 39.1% of surgeries suspended[14]. In the distribution of cancellations, Orthopedics appears with the highest absolute value, 133 (28.5%), as well as in a study in which it represents 18.4% of total cancellations[4]. In three other investigations, the highest number of cancellations belongs to General Surgery; however, in this study, such a specialty presented the third highest frequency[6,9,13].

The most frequent reason for cancelling surgeries was the "surgeon's criterion". In the study by Nascimento et al.[7], a similar reason appears as the most frequent one, called "Clinic's request", and the authors state that "this reason, in fact, hides the real motivation for suspension". This justification for cancellation corroborates the results in this study, which was also the most used one for all clinical specialties. Then there were the reasons "Lack of hospital beds" and "Non-attendance". The former appears in other studies[11] as a

reason for cancellation, and the latter is very common[4-6,8,13,16]. One of the main reasons for cancellation observed in other analyses is the unfavorable clinical condition, which, in this study, represented only 2.1% of the cases. It is possible that other cases, when patients were not clinically prepared for the surgical procedure, are included in those cancellations requested by the surgeon.

The results showed high cancellation rates, and the reasons could not be identified in detail, because more than half of those observed in the period was requested by the surgeon, without specificities, so there could be different reasons. With this difficulty, it was chosen to elaborate a protocol to register cancellations and their causes in detail, including more information and a list of justifications for this procedure, according to Appendix 1.

FINAL CONSIDERATIONS

The number of cancellations of scheduled surgical procedures found in this study was high, especially among SUS patients, mostly female. The specialties that cancelled more frequently in the period were Orthopedics and Proctology. The causes could not be identified in detail, because the most common justification was "surgeon's criterion", thus not describing clearly the exact reason leading that procedure to be cancelled.

These cancellations cause several biopsychosocial consequences to the patient, changes in the family and health professionals in the several sectors of the hospital. Material resources are wasted from both sides, generating costs that could be prevented by not cancelling the procedures. Efficient interventions can be implemented, however, the decision over which are most adequate for the context depends on an evaluation regarding the situation of the institution.

The perspective of this study encourages the use of the protocol presented in Appendix 1, with the record of specific data regarding surgeries and the reasons for cancellation. This protocol was built to include new information, so that it is possible to make more comparisons with the results obtained in other studies.

Literature presents several interventions that can be performed to reduce the incidence of each reason for cancellation, so a new registration system for the suspensions may favor an analysis that will lead to a better diagnosis of this problem. After some interventions, it may be possible to observe a reduction in the rates of cancellation of this institution. Therefore, the highest level of satisfaction of employees and patients involved may be achieved with the improved quality of care in the institution. So, the service can be more effective, contributing to the increasing quality in the care provided by the institution.

REFERENCES

1. Goffi FS. Técnica cirúrgica: bases anatômicas, fisiopatológicas e técnicas da cirurgia. 4. ed. São Paulo: Atheneu; 2007.
2. Maia MR, Mativi EO, Malamão KA, Bomfim MV. Enfermagem em Centro Cirúrgico, Central de Materiais e Esterilização e Recuperação Pós-Anestésica. In: Murta GF, organizadora. Saberes e práticas: guia para o ensino e aprendizagem de enfermagem, 3º volume, 4. ed. São Caetano do Sul, SP: Difusão; 2009. p. 301-92.
3. SOBECC. Práticas Recomendadas SOBECC: Centro Cirúrgico, Recuperação Pós-Anestésica, Centro de Material e Esterilização. 5 ed. São Paulo: SOBECC; 2009.
4. Macedo JM, Kano JA, Braga EM, Garcia MA, Caldeira SM. Cancelamento de cirurgias em um hospital universitário: causas e tempo de espera para novo procedimento. Rev SOBECC. 2013;18(1):26-34.
5. Landim FM, Paiva FD, Fiuza ML, Oliveira EP, Pereira JG, Siqueira I. Análise dos fatores relacionados à suspensão de operações em um serviço de cirurgia geral de média complexidade. Rev Col Bras Cir. 2009;36(4):283-7.
6. Perroca MG, Jericó MC, Facundin SD. Cancelamento cirúrgico em um hospital escola: implicações sobre o gerenciamento de custos. Rev Lat-Am Enferm. 2007;15(5):48-53.
7. Nascimento LA, Tillvitz LR, Garcia AC, Fonseca LF. Além das taxas de suspensão cirúrgica: uma análise de seus reais motivos. VII EPCC – Encontro Internacional de Produção Científica Cesumar; 2011; Maringá. Maringá: CESUMAR; 2011.
8. Perroca MG, Jericó MC, Facundin SD. Monitorando o cancelamento de procedimentos cirúrgicos: indicador de desempenho organizacional. Rev Esc Enferm USP. 2007;41(1):113-9.

9. Paschoal ML, Gatto MA. Taxa de suspensão de cirurgia em um hospital universitário e os motivos de absenteísmo do paciente à cirurgia programada. Rev Lat-Am Enferm. 2006;14(1):48-53.

10. Ávila MA, Gonçalves IR, Martins I, Moyses AM. Cancelamento de cirurgias: uma revisão integrativa da literatura. Rev SOBECC. 2012;17(2):39-47.

11. Histórico do Hospital das Clínicas Samuel Libânio. Pouso Alegre: Hospital das Clínicas Samuel Libânio; 2013 [citado em 2013 nov 10]. Disponível em: http://mentorweb.univas.edu.br/hcsl/hcsl_Interna.asp?opc=1

12. Mendes FF, Mathias LA, Duval Neto GF, Birck AR. Impacto da implantação de Clínica de Avaliação Pré-Operatória em indicadores de desempenho. Rev Bras Anestesiol. 2005;55(2):175-87.

13. Pittelkow E, Carvalho R. Cancelamento de cirurgias em um hospital da rede pública. Einstein (São Paulo). 2008;6(4):416-21.

14. Barbosa MH, Goulart DM, Andrade EV, Mattia AL. Análise da suspensão de cirurgias em um hospital de ensino. 2012;26:174-83.

15. Fonseca KA, Oliveira Júnior LB, Beraldo AF, Araújo DA. Indicadores hospitalares: monitoramento e análise do cancelamento das cirurgias pactuadas do HU/CAS – UFJF com o PRO-HOSP. HU Revista. 2009;35(3):199-207.

16. Kumar R, Gandhi R. Reasons for cancellation of operation on the day of intended surgery in a multidisciplinary 500 bedded hospital. J Anaesthesiol Clin Pharmacol. 2012;28(1):66-9.

Appendix 1. Form to register the cancellation of surgeries.

Nome: _____ Idade: _____ Sexo: ( ) M ( ) F
Data: _____ / _____ / _____

Nome da cirurgia: _____

Especialidade:
( ) Cardiologia
( ) Ginecologia
( ) Geral
( ) Neurologia
( ) Odontologia
( ) Oftalmologia
( ) Oncologia
( ) Ortopedia
( ) Otorrinolaringologia
( ) Pediatria
( ) Plástica
( ) Proctologia
( ) Urologia
( ) Vascular

Turno: ( ) Manhã ( ) Tarde ( ) Noite

Dia da semana: ( ) Segunda ( ) Terça ( ) Quarta ( ) Quinta ( ) Sexta

Agendamento: ( ) Eletiva ( ) Comunicação Interna ( ) Emergência

Plano de Saúde: ( ) SUS ( ) Convênio ( ) Particular

Porte: ( ) Pequeno ( ) Médio ( ) Grande ( ) Não identificado

Momento da suspensão: ( ) Antes do preparo da SO ( ) Depois do preparo da SO
( ) Durante o procedimento anestésico-cirúrgico

Causas:

Paciente	( ) Não comparecimento	( ) Recusa à realização de cirurgia
	( ) Condição clínica desfavorável	( ) Intubação difícil
	( ) Falta de jejum	( ) Paciente foi a óbito
Org. da Unidade	( ) Falta de vaga	( ) Erro na programação cirúrgica
	( ) Prioridade para urgência	( ) Transferência para outro hospital
	( ) Falta de exames	
Recursos Humanos	( ) Falta de hemoderivados	( ) Falta de instrumentador
	( ) Tempo cirúrgico excedido	( ) Preparo pré-operatório sem êxito
	( ) Falta de anestesiologista	( ) Não liberado pela anestesista
	( ) Falta de cirurgião	( ) Mudança de conduta médica
	( ) Falta de equipe de enfermagem	
Recursos Materiais	( ) Falta de material	( ) Falta de equipamentos
	( ) Outros	( ) Não especificado

PROCESSING OF HEALTH PRODUCTS IN MATERIAL AND STERILIZATION CENTERS*

Processamento de produtos para saúde em centro de material e esterilização

Procesamiento de productos para salud en centro de material y esterilización

Maria Zélia de Araújo Madeira[1], Ana Maria Ribeiro dos Santos[2], Odinéa Maria Amorim Batista[3], Flávia Tomaz Coelho Rodrigues[4]

ABSTRACT: Objective: To analyze the processing of health products in Material and Sterilization Centers (MSC) in Health Care Establishments of the city of Teresina – PI. **Method:** Transversal analytic observational study performed at three health care establishments through an interview with the professional in charge for the MSC and through direct observation *in loco* with a script. **Results:** Two of the health care establishments studied presented appropriate technical conditions and one presented partially appropriate techniques. The professionals in charge of the MSC related an insufficient staff for the work demand. **Conclusion:** It was observed, in one of the places studied, the noncompliance with the current legislation, which constitutes sanitary infraction and represents a risk to the safety of the process and the patient. Some structural and organizational adjustments are required. Also, human resources management is necessary.

Keywords: Sterilization. Nursing. Patient safety.

RESUMO: Objetivo: Analisar o processamento de produtos para saúde em Centro de Material e Esterilização (CME) de Estabelecimentos de Assistência à Saúde do município de Teresina (PI), Brasil. **Método:** Estudo observacional analítico de seguimento transversal realizado em três estabelecimentos de assistência à saúde, por meio de uma entrevista com o profissional responsável pelo CME e da observação direta *in loco,* a partir de um roteiro. **Resultados:** Dois dos locais pesquisados apresentaram condições técnicas adequadas e um apresentou condições técnicas parcialmente adequadas. Os profissionais responsáveis relatavam quadro de pessoal insuficiente para a necessidade de trabalho. **Conclusão:** Observou-se em um dos locais pesquisados o descumprimento das legislações vigentes, o que constitui infração sanitária e põe em risco a segurança do processo e do paciente, sendo necessárias adaptações estruturais e organizacionais. Além da necessidade de gerenciamento de recursos humanos.

Palavras-chave: Esterilização. Enfermagem. Segurança do paciente.

RESUMEN: Objetivo: Analizar el procesamiento de productos para salud en Centro de Material y Esterilización (CME) de Establecimientos de Asistencia de Salud en el municipio de Teresina-PI. **Método:** Estudio observacional analítico de seguimiento transversal realizado en tres establecimientos de asistencia de salud por medio de entrevista con el profesional responsable por el CME y observación directa in situ con un guión. **Resultados:** Dos de los locales analizados presentaron condiciones técnicas adecuadas y uno presentó condiciones técnicas parcialmente adecuadas. Los profesionales responsables relataban un cuadro de personal insuficiente a la necesidad. **Conclusión:** Se observó en uno de los locales analizados el incumplimiento de las legislaciones vigentes, lo que constituye infracción sanitaria y pone en riesgo la seguridad del proceso del paciente. Siendo necesarias adecuaciones estructurales y organizacionales. Además, la necesidad de gerenciamiento de recursos humanos.

Palabras clave: Esterilización. Enfermería. Seguridad del paciente.

[1]Nurse. PhD in Medical Sciences, Universidade Estadual de Campinas (UNICAMP). Professor in the Nursing program of Universidade Federal do Piauí (UFPI). E-mail: zeliamadeira15@yahoo.com.br
Rua Humberto de Campos, 1291. Lourival Parente. CEP: 64023-600. Teresina (PI), Brasil. Telefone: (86) 99987-2371
[2]Nurse. PhD in Sciences, Universidade de São Paulo (USP). Professor in the Nursing program of UFPI. E-mail: ana.mrsantos@gmail.com
[3]Nurse. Master in Nursing, UFPI. Professor in the Nursing program of UFPI. E-mail:oenf@uol.com.br
[4]Undergraduate student in Nursing, UFPI. E-mail: fflaviatomaz@gmail.com
*Article resulting from a term paper: Processing of Health Products in Material and Sterilization Centers, 2014, Universidade Federal do Piauí.
Received: 02 May 2015 – Approved: 24 Sep. 2015.
DOI: 10.5327/Z1414-4425201500040006

INTRODUCTION

The Material and Sterilization Center (MSC) is defined as a functional unit intended for processing health products[1]. Its mission is to supply the care and diagnostic services with processed materials, ensuring the quantity and quality needed for safe care[2].

The MSC is an important department that supports health institutions, associated to the quality of services provided[3]. With technological advancement and the development of surgical techniques, instruments have become more complex and sophisticated, resulting in the need for improvement in material processing techniques and personnel to the performance of these tasks[4].

Any failure during processing involves possible compromise to sterility, increasing risk of trans- or postoperative infection cases and in all non-surgical procedures, such as dressing[5].

Careful inspection of cleaning is one of the critical points so that a product can be reused, because waste can prevent the contact of the sterilizing agent, causing adverse immune effects in patients, such as Systemic Inflammatory Response Syndrome (SIRS) and eye Toxic Anterior Segment Syndrome (TASS), aside from contributing to accelerate damage to the instruments[2].

In this sense, the professionals working in the MSC should take active responsibility in the prevention and control of hospital infections, adopting measures to cause microbial death and ensure the safety of material processing[4,6].

Work on the MSC is full of difficulties associated with the work process itself, including the existence of occupational hazards, lack of human resources, lack of support due to the institutional demand, instability in the intersectoral communication and professionals acting without technical training for the job, reflecting directly on workers and on and the quality of the indirect assistance provided[4].

From these reflections, the following question arose: "How does the processing of products in the Material Sterilization Center (MSC) occur in Health Care Establishments (EAS) in the city of Teresina (PI)?".

OBJECTIVE

To analyze the processing activities of the Material Sterilization Center in Health Care Establishments in the city of Teresina (PI), Brazil.

METHODOLOGY

Transversal analytic observational study, carried out in three Health Care Establishments: a large hospital and education center, a large philanthropic hospital and a Health Unit of the city of Teresina (PI), in June 2014.

Data were obtained through interviews with the professionals in charge of the MSC and direct observation in loco with an observation script.

The observation instrument was elaborated with closed questions, based on the inspection checklist of the Brazilian Health Surveillance Agency (ANVISA)[7] for Material and Sterilization Centers, on the existing national legislation[1,8-10] and practices of the Association of Operating Room Nurses, Anesthetic Recovery and Material and Sterilization Center (SOBECC). It was based on three categories:

1. physical structure of the MSC;
2. product processing;
3. worker's health.

Each category was built with independent variables and the following scores: one (1) = adequate response; and zero (0) = inadequate response, totaling 96 points, allocated according to the categories described. After scoring each category, the percentage of responses were calculated.

The Establishments with a Class I MSC and the one with a Class II MSC received a score that was calculated, respectively, in the following formula: Final score = score obtained / maximum score (77) x 100, and final score = score obtained / maximum score (96) x 100. This difference occurred because some items of the instrument did not apply to both realities. They were classified into three levels: adequate (67 – 100%), partially adequate (66 – 34%) or inadequate (33 – 0%).

The inclusion criterion was fully operational MSCs with one professional in charge present during the direct observation; and the exclusion criteria was MSCs that did not meet these requirements.

The project was approved by the Ethics Committees of the Health Care Establishments (HCE) and the Research Ethics Committee (CEP) of Universidade Federal do Piauí, CAAE No. 30987614.7.0000.5214. All ethical guidelines of Resolution No. 466/2012 of the National Council on Health were met[11]. The participants also signed an Informed Consent.

RESULTS

The three health care establishments have their own Material and Sterilization Centers and performed the processing of products; one was a small MSC, classified as Class I (HCE 1); and two MSCs as Class II (HCE 2) and (3 HCE).

MCSs surveyed are coordinated by nurses. According to the profile, they are in the 25-35 years age group. In two HCEs, professionals had been working in the establishment for 1-3 years, and only one professional had been for more than three years. In the Class II MCSs, the professionals in charge were exclusive to the department, having been working there for 1-3 years. These units have 2 or more nurses.

Table 1 below shows that the three MSCs performed the cleanup, disinfection and sterilization activities on products in a centralized manner. They had all recommended areas for the activities performed. It was also noted that there were physical barrier between the areas considered contaminated and cleaned. All had containers for the disposal of perforating objects.

It is also noteworthy that HCE 1 did not have its own dryer with filtered hot air, medical air guns for drying products and magnifying lenses with at least 8x magnification, to visually assess the cleaning. In this MSC, the transportation of materials was not conducted with wheeled tables or trolleys, and distribution was not performed in closed containers.

The dimensions of workbenches in all MSCs were compatible with the activities to be performed. The workstations had ergonomic chairs or stools with adjustable height. The conditions of the floor, walls, ceiling and lighting were adequate. HCE 1 did not perform preventive maintenance of machines and had no system for keeping monitoring records for 5 years.

Table 2 presents the flow of continuous, unidirectional product processing in all MSCs surveyed. The products to be processed are received in the reception and cleanup area, cleaned, dried, checked and separated, sent to the preparation area, where they are inspected, packed and sent to sterilization, storage and distribution.

However, in HCE 1, workers in the dirty area transited to the clean area and vice versa. There was not a Standard Operating Procedure (SOP) for the processing steps either. All surveyed MSCs had appropriate devices for manual cleaning, during which the instruments are disassembled before cleaning and visual inspection during the drying stage. Only in HCE 2 the solution was not changed after every use.

The MSCs of HCE 2 and 3 performed chemical disinfection, which is made with a glutaraldehyde or peracetic acid

Table 1. Characterization of Materials and Sterilization Centers according to physical structure. Teresina, PI, 2014.

Items	HCE 1	HCE 2	HCE 3
Centralized department	Yes	Yes	Yes
Has all areas recommended by RDC nº 15	Yes	Yes	Yes
Has a recipient for the disposal of perforating materials	Yes	Yes	Yes
Has workbenches with dimensions that allow the conference of materials	Yes	Yes	Yes
Has cold and hot water taps	No	No	No
Has its own dryer with filtered hot air and compressed medical air guns	No	Yes	Yes
Has wheeled tables or trolleys for transportation	No	Yes	Yes
Has workstations with ergonomic chairs or stools	Yes	Yes	Yes
Has magnifying lenses with at minimum 8x magnification	No	Yes	Yes
Carries out preventive maintenance of machines	No	Yes	Yes
Has a system for keeping monitoring records for 5 years	No	Yes	Yes
The distribution of materials is carried out in closed containers	No	Yes	Yes
Clean environment, abrasion-resistant flooring, walls with waterproof coatings, roof in good condition and natural lighting	Yes	Yes	Yes

RDC: *Resolução de Diretoria Colegiada*; HCE: Health Care Establishments.

Table 2. Characterization of Materials and Sterilization Centers according to product processing. Teresina, PI, 2014.

Items	HCE 1	HCE 2	HCE 3
Continuous and unidirectional flow	Yes	Yes	Yes
Workers in the dirty area do transit in the clean clean and vice versa area without removal of PPE and adequate hand hygiene	No	Yes	Yes
There is a Standard Operation Procedure in place for processing stages	No	Yes	Yes
Has appropriate equipment for manual cleaning	Yes	Yes	Yes
Disassembles the instruments before cleaning	Yes	Yes	Yes
Changes the solution with every use	Yes	No	Yes
Conducts a visual assessment during cleaning	Yes	Yes	Yes
Uses a glutaraldehyde or peracetic acid solution in disinfection	-	Yes	Yes
Uses labels in the outer sealed package	No	Yes	Yes
The chamber in the equipment is filled up to 80% of maximum capacity	Yes	Yes	Yes
Uses packaging recommended by ANVISA	No	Yes	Yes
Conducts the Bowie-Dick test	No	Yes	Yes
Uses Class V or VI chemical indicator	No	No	Yes
The monitoring of the physical parameters is recorded in each sterilization cycle	No	Yes	Yes
Sterilization is daily monitored with a biological indicator in the loads	No	Yes	Yes
The sterilization process is documented and records are kept for a minimum of 5 years	No	Yes	Yes

PPE: personal protection equipment; HCE: Health Care Establishments.

solution. In these places, there is the complete immersion of the product in the solution, respecting the time recommended by the manufacturer. Professionals handle the disinfected materials with a clean technique and record the disinfection process in writing.

As also shown in Table 2, HCE 1 does not use packaging recommended by ANVISA or labels and in the outside of the sealed package. In all establishments surveyed, the critical heat-resistant materials are sterilized by saturated steam (autoclave) and the equipment's chamber is filled up to a maximum of 80% of the total capacity.

The HCE 1 does not use the Bowie-Dick test (Class II indicator) and does not perform monitoring with a biological indicator. Class V or VI chemical indicators are used for routine monitoring of the success of sterilization and release only in HCE 3.

The monitoring of the physical parameters is recorded in every sterilization cycle and the process is documented and filed for a minimum of five years in HCEs 2 and 3.

Table 3 shows that the professionals working in the department receive training in the three MSCs. The facilities provide PPE to employees; however, professionals in HCE 1 were not using them. MSCs have their own dressing room with toilets and showers for employees. HCE 1 does not have a room dedicated to the employee's rest period. In all MSCs, the professionals in charge reported insufficient staff for the workload.

According to the graph shown in Figure 1, in HCE 1, from a total of 77 observations, 43 (56%) were adequate. In HCEs 2 and 3, from a total of 96 observations, respectively, 82 (85%) and 90 (94%) were adequate.

In the study, the three institutions were classified based on the following score: inappropriate MSC = 0-33%; partially adequate MSC = 34-66%; and adequate MSC = 67-100%.

As revealed in Table 4, with a percentage of 56% of adequate observations, we can classify MSC in HCE 1 as partially adequate. With the percentage of 85 and 94% of

Table 3. Characterization of Materials and Sterilization Centers according to worker's health. Teresina, PI, 2014.

Items	HCE 1	HCE 2	HCE 3
There is training for professionals working in the MSC	Yes	Yes	Yes
The establishment provides PPE	Yes	Yes	Yes
Number of professionals is adequate to workload	No	No	No
Workers use the PPE	No	Yes	Yes
Has changing rooms with toilets and showers for employees	Yes	Yes	Yes
Has a room dedicated for the rest period	No	Yes	Yes
PPE available	Goggles, procedure gloves, long-barreled nitrile or butyl rubber gloves, mask and long-sleeve impermeable apron.	Goggles, procedure gloves, mask, long-sleeve impermeable apron and waterproof anti-slip footwear	Goggles, procedure gloves, long-barreled nitrile or butyl rubber gloves, mask, long-sleeve impermeable apron, waterproof anti-slip footwear and ear plugs.

MSC: Materials and Sterilization Centers; PPE: personal protection equipment; HCE: Health Care Establishments.

adequate observations, we can classify, respectively, MSCs in HCE 2 and 3 as adequate.

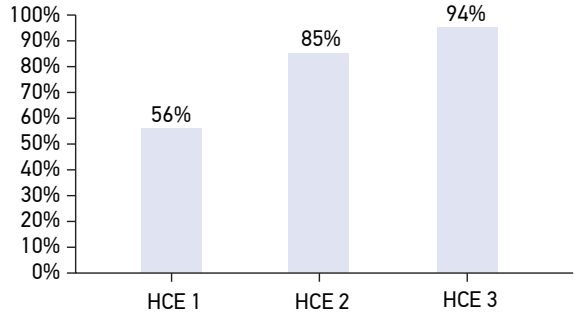
DISCUSSION

The professionals in charge of the MSCs studied were young nurses. The MSC must have a college-graduated professional in charge for the coordination of all activities related to the processing of products[1,2].

A study conducted in basic health units in the state of São Paulo found that the technical responsibility for the reprocessing of critical items in these places was legally assigned to the nurse. For the authors, this professional must possess basic knowledge for planning and evaluation of this process[12].

In the Class II MSC, the professional in charge should operate exclusively in this unit during their workday[1,2]. The exclusivity of the nurse in the department is supported by their knowledge on care actions and on their ability to see the needs of the work, giving them the fundamental characteristics to coordinate the MSC[13]. Thus, the surveyed units were adequate.

In physical structure category, the MSCs studied have all of the areas recommended, and the presence of a physical



HCE: Health Care Establishments.

Figure 1. Percentages of adequacy of Materials and Sterilization Centers of Health Care Establishments.

Table 4. Classification of Materials and Sterilization Centers of Health Care Establishments. Teresina, PI, 2014.

Classification	HCE 1	HCE 2	HCE 3
Adequate MSC	–	85%	94%
Partially adequate MSC	56%	–	–
Inadequate MSC	–	–	–

MSC: Materials and Sterilization Centers; HCE: Health Care Establishments.

barrier between the areas considered contaminated and clean was observed. These spaces are proposed with the objective of the organization and optimization of the work process, as well as environmental separation in order to reduce the risk of contamination[1,2].

In one of the establishments surveyed (HCE 1), the physical structure did not have the materials needed to carry out the processing, such as: its own dryer with filtered hot air, medical air guns for drying products and magnifying lenses. A Class I MSC must have medical compressed air, inert gas or filtered air, dry and free of oil, for drying the material, and the cleanliness of products should be assessed by visual inspection, with the help of magnifying lenses[1].

The dryers with filtered hot air and medical air guns ensure proper and complete drying of materials with minimal handling, and the magnifying lenses ensure greater accuracy in the visual assessment of cleaning[2].

The distribution of materials in one of the establishments (HCE 1) was not done in closed containers. The transportation of processed products should be done in closed containers, according to the Resolution of the Collegiate Board of Directors (RDC no. 15)[1].

These data show the absence of some physical conditions in HCE 1 for carrying out the basic activities. The physical structure of the MSC has significant importance in the control of hospital infections, since it can interfere with processing steps, and its microbiological barriers, if inadequate, can facilitate the transmission of microorganisms[14].

In the product processing category, the flow of materials is continuous and unidirectional in every MSC. However, in one case, workers transited between the dirty and the clean areas. The continuous unidirectional flow of material and personnel is needed in order to avoid cross-contamination of dirty materials with clean and sterilized materials, in order to ensure the rationalization of the work[2].

All MSCs surveyed had appropriate devices for manual cleaning, which occurs when instruments are disassembled before the cleaning and visual inspection during drying. One of the establishments did not change the solution after every use. The presence of suitable items and the implementation of best practices are indispensable in order to ensure safety and efficiency in processing and to prevent damage to the products[2].

Two establishments (HCE 2 and 3) perform chemical disinfection, which is made with a glutaraldehyde or peracetic acid solution. In these MSCs, the products are completely immersed in the solution, respecting the time recommended by the manufacturer. Professionals handle the disinfected materials with a clean technique and record the disinfection process in writing.

Germicides used for chemical disinfection must be approved and registered by ANVISA, such as glutaraldehyde and peracetic acid. The contact of the disinfectant solution with all surfaces of the product and the exposure time recommended by the manufacturer ensure process efficiency. The handling of products disinfected with a clean technique prevents recontamination of materials, and the record of disinfection allows monitoring and traceability[2]. The establishments were studied according to the recommendations, in order to ensure the safety of the procedure and the patient.

The processing of products, in one of the units surveyed, was held without labels on the outside of the sealed package, although identification is required on the packaging of the product undergoing sterilization by means of labels[1].

One of the establishments (HCE 1) did not use packaging recommended by ANVISA. The used containers should be regularized by ANVISA for specific use in sterilization. It is not allowed the use of kraft paper packaging, paper towels, manila, newsprint and aluminum blades[1].

The monitoring of sterilization with a Class II chemical indicator (Bowie-Dick), biological indicators and physical parameters was not performed. It is mandatory to carry out a test to evaluate the performance of the air removal system (Class II indicator) of the vacuum pump-assisted autoclave, in the first cycle of the day. The control with biological indicators must be done daily in a test pack, and with physical indicators, it should be recorded after each cycle[1].

In one of the establishments (HCE 1), the sterilization process was not recorded, the preventive maintenance of the machines was not performed and there was no Standard Operating Procedure (SOP) for the processing steps. MSCs must have a manual or automated information system to record the monitoring and control of the cleaning and disinfection or sterilization steps, as well as the maintenance and monitoring of equipment. Each step in the processing of medical materials must follow a SOP based on current scientific framework and appropriate standardization[1].

Two locations (HCEs 1 and 2) did not use class V or VI chemical indicators for control of the sterilization process. Monitoring should be done in each load in a test test pack with chemical integrators (V or VI classes)[1].

The results show non-compliance with legal requirements. The sterilization practice within pre-established criteria, based on official investigations and standards, is essential to ensure that procedures involving critical items are not responsible for the transmission of infections[12]. Failures in control may reflect on the quality of customer service, since they constitute a risk factor for transmission of infections[6].

In all HCEs, the absence of cold and hot water taps was observed. These items are recommended in order to avoid adverse events to the patient and damage to the processed products and equipment[2].

From these results, we can see the disparity of realities in different aspects (municipal hospital, state hospital and philanthropic hospital). Due to the complexity of the procedures performed in large hospitals, they are equipped with an adequate MSC and complex physical and operational structure. But the small hospital, for performing less complex procedures, has neglected its MSC, endangering the security of the processing activities and of the patient.

A study conducted in hospitals of Salvador, which aimed to analyze the technical conditions for the reprocessing of medical products, found structural and procedural inadequacies in the MSCs studied. According to these authors, the results are reflexes of managerial and organizational difficulties of the MSC, the result of lack of investment and limited supply of material resources[15].

On the workers' health category, the establishments surveyed offer training to the professionals working in the department. These should be given specific and periodic training according to RDC No. 15[1].

In the MSCs surveyed, the professionals in charge reported insufficient staff for the workload. This finding is consistent with findings in the literature. Despite the vital role that MSCs plays in the quality of care, it is noted that that this sector has an insufficient number of employees, or a lack of proper employee qualification for the development of activities[16].

A study conducted in a MSC of a public hospital in Goiania (GO) analyzed the forced that drive and restrain work in that department and found that the deficit of human and material resources restrict the work process, pointing to a need to find solutions that can count on the support from managers and the institution[17].

The nurse responsible for the MSC needs to establish strategies to cope with the shortage of human resources[4]. In this sense, activities to be developed should be managed, foreseeing and organizing priorities without jeopardizing the safety and quality of processing[12].

All establishments surveyed provided PPE to employees. However, in HCE 1, the professionals did not use such equipment. A study conducted in a hospital in Rio Grande do Sul with nursing assistants and technicians who work in a Materials and Sterilization Center, noted that most reported use of PPE, which reinforces the importance that the worker attributes to the use of this equipment for the prevention of occupational accidents[14].

Another study conducted in primary care units in the State of São Paulo with professionals working in the MSC found that these workers do not make proper use of PPE[12]. It is worth noting that these equipment, when used, are extremely important for worker protection, but it is considered that, for adherence to its use, companies need to test them with workers and hear their suggestions and criticisms[18].

Two of the HCEs showed adequate technical conditions and presented good scores in all three categories. In these places, we found adequate physical structures and organizational conditions for the activities developed by the MCS, showing interest and investment in this department, in addition to compliance with current legislation. One of the establishments had partially adequate technical conditions and showed some level of non-compliance in all categories, requiring structural and organizational adjustments in the establishment surveyed.

Work in a MSC requires risk planning and management, and this is only possible with adequate physical and operational structure and committed professionals[15].

CONCLUSION

This study allowed us to analyze the product processing activities in Material and Sterilization Centers in Health Care Establishments, as this department plays an important role in the prevention of nosocomial infection and in the quality of care delivered to the customer.

Of the establishments surveyed, two had adequate technical conditions and one had partially adequate technical conditions, demonstrating the disparity of interest and investment from managers in the different realities. It was observed that, in one of the establishments, there was non-compliance with the existing laws, such as RDC No. 15/2012, which constitutes a health violation and endangers the safety of processing and

the patient, requiring structural and organizational adjustments in the surveyed site.

In the MSCs surveyed, professionals in charge reported insufficient staff for the workload, pointing to the indispensability of human resource management with the support of managers and institution. It was also noted that one of the places that workers that did not use PPE. These equipments are of fundamental importance for the protection and safety of the worker.

To ensure the quality and safety of the processing, adequate physical structure, organizational conditions and human resources are essential.

REFERENCES

1. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução nº 15, de 15 de março de 2012. Dispõe sobre requisitos de boas práticas para o processamento de produtos para saúde e dá outras providências. Brasília: Diário Oficial da União; 2012.

2. Sociedade Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização – SOBECC. Manual de Práticas Recomendadas da SOBECC. 6. ed. São Paulo: SOBECC; 2013.

3. Taube SAM, Labronici LM, Maftum MA, Méier MJ. Processo de Trabalho do Enfermeiro na Central de Material e Esterilização: percepção de estudantes de Graduação em Enfermagem. Cienc Cuid Saúde. 2008;7(4):558-64.

4. Pezzi MCS, Leite JL. Investigação em Central de Material e Esterilização utilizando a Teoria Fundamentada em Dados. Rev Bras Enferm. 2010;63(3):391-6.

5. Silva AC, Aguiar BGC. O Enfermeiro na Central de Material e Esterilização: uma visão das unidades consumidoras. Rev. Enferm. 2008;16(3):377-81.

6. Tipple AFV, Pires FV, Guadagnin SVT, Melo DS. O monitoramento de processos físicos de esterilização em hospitais do interior do estado de Goiás. Rev Esc Enferm. 2011;45(3):751-7.

7. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Tecnologia da Organização dos Serviços de Saúde. Instrumento Nacional de Inspeção em Serviços de Saúde – INAISS. Centro de Material Esterilizado. [acesso em 2013 dez 17]. Disponível em: http:/ www.anvisa.gov.br/servicosaude/organiza/inaiss/index2.htm

8. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução nº 50, de 21 de fevereiro de 2002. Dispõe sobre o Regulamento Técnico destinado ao planejamento, programação, elaboração, avaliação e aprovação de projetos físicos de estabelecimentos assistenciais de saúde. Brasília: Diário Oficial da União; 2002.

9. Brasil. Ministério da Saúde. Agência Nacional de Vigilância Sanitária. Resolução nº 307, de 14 de novembro de 2002. Altera a Resolução - RDC nº 50 de 21 de fevereiro de 2002. Brasília: Diário Oficial da União; 2002.

10. Brasil. Ministério do Trabalho e Emprego. Norma Regulamentadora 32, de 30 de agosto de 2011. Dispõe sobre segurança e saúde no trabalho em serviços de saúde. Brasília: Diário Oficial da União; 2011.

11. Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução nº 466, de 12 de dezembro de 2012. Diretrizes e Normas Regulamentadoras de Pesquisas Envolvendo Seres Humanos. Brasília: Diário Oficial da União; 2013.

12. Costa LFV, Freitas MIP. Reprocessamento de artigos críticos em unidades básicas de saúde: perfil do operador e ações envolvidas. Rev Bras Enferm. 2009;62(6):811-9.

13. Taube SAM, Meier MJ. O processo de trabalho da enfermeira na central de material e esterilização. Acta Paul Enferm. 2007;20(4):470-5.

14. Espíndola MCG, Fontana RT. Riscos ocupacionais e mecanismos de autocuidado do trabalhador de um centro de material e esterilização. Rev Gaúcha Enferm. 2012;33(1):116-23.

15. Costa EAM, Costa EA. Risco e segurança sanitária: análise do reprocessamento de produtos médicos em hospitais de Salvador, BA. Rev Saúde Pública. 2012;46(5):800-7.

16. Costa JA, Fugulin FMT. Atividades de enfermagem em centro de material e esterilização: contribuição para o dimensionamento de pessoal. Acta Paul Enferm. 2011;24(2):249-56.

17. Martins VMF, Munari DB, Tipple AFV, Bezerra ALQ, Leite JL, Ribeiro LCM. Forças impulsoras e restritivas para trabalho em equipe em um Centro de Material e Esterilização de hospital escola. Rev Esc Enferm. 2011;45(5):1183-90.

18. Ribeiro RP, Vianna LAC. Uso dos Equipamentos de Proteção Individual entre Trabalhadores das Centrais de Material e Esterilização. Cienc Cuid Saúde. 2012;11(Supl.):199-203.

HEART TRANSPLANTED PATIENTS IN MEDIATE POSTOPERATIVE PERIOD: NURSING DIAGNOSES BASED ON HORTA ASSUMPTIONS*

Transplantados cardíacos em pós-operatório mediato: diagnósticos de Enfermagem segundo pressupostos de Horta

Trasplantados cardíacos en el pos-operatorio mediato: diagnósticos de Enfermería según los supuestos de Horta

Selme Silqueira de Matos[1], Aidê Ferreira Ferraz[1], Gilberto de Lima Guimarães[1], Vania Regina Goveia[1], Isabel Yovana Quispe Mendoza[1], Salete Maria de Fátima Silqueira[2], Tânia Couto Machado Chianca[3], Dacle Vilma Carvalho[4]

ABSTRACT: Objective: To identify the profile of Nursing diagnoses in heart-transplanted patients in the postoperative period from the Taxonomy II of the North-American Nursing Diagnosis Association, and to discuss them using Horta's assumptions and scientific literature. **Method:** A retrospective, descriptive, exploratory study performed in Belo Horizonte, Minas Gerais State, Brazil, in a large-sized general hospital. The sample consisted of 49 adult patients, aged ≥18 and <60 years, of both genders, heart-transplanted subjects in the postoperative period. Data were collected from patient records. **Results:** We identified 12 Nursing diagnoses, divided into 10 real and two potential ones, 100% belonging to the psychobiological basic human need. **Conclusion:** There was not a diagnostic identification for psychosocial and psychospiritual needs. According to Horta, the biologicist paradigm moves Nursing career to the patient's fragmentation, keeps nurse in alienation, and is opposed to the pragmatic focused on holism.

Keywords: Nursing diagnosis. Heart transplantation. Perioperative nursing. Nursing theory.

RESUMO: Objetivo: Identificar o perfil dos diagnósticos de Enfermagem nos pacientes transplantados cardíacos em pós-operatório mediato, a partir da Taxonomia II da *North-American Nursing Diagnosis Association*, e discuti-los à luz dos pressupostos de Horta e da literatura científica. **Método:** Estudo retrospectivo, descritivo, exploratório, realizado em um hospital geral de grande porte de Belo Horizonte, em Minas Gerais. A amostra foi composta por 49 pacientes adultos, de ambos os sexos, idade ≥18 anos e <60 anos, transplantados cardíacos em pós-operatório mediato. Os dados foram coletados a partir do prontuário do paciente. **Resultados:** Foram identificados 12 diagnósticos de Enfermagem, classificados em 10 reais e dois potenciais, sendo 100% pertencentes à necessidade humana básica psicobiológica. **Conclusão:** Não houve identificação diagnóstica para as necessidades psicossocial e psicoespiritual. Segundo Horta, o paradigma biologicista move a carreira à fragmentação do paciente, mantém o enfermeiro em alienação e opõe-se à pragmática centrada no holismo.

Palavras-chave: Diagnóstico de enfermagem. Transplante de coração. Enfermagem perioperatória. Teoria de enfermagem.

RESUMEN: Objetivo: Identificar el perfil de los diagnósticos de Enfermería en pacientes trasplantados cardíacos, durante el pos-operatorio mediato utilizándose la Taxonomía II del *North-American Nursing Diagnosis Association*, y discutirlos basándose en los supuestos de Horta y de la literatura científica. **Método:** Estudio retrospectivo, descriptivo y exploratorio, realizado en un hospital general de gran tamaño en Belo Horizonte, Minas Gerais, Brasil. La muestra fue compuesta por 49 pacientes adultos, de ambos los géneros, con edad ≥18 años y <60 años, trasplantados cardíacos en el pos-operatorio mediato. Los datos fueron recolectados desde la historia clínica del paciente. **Resultados:** Fueron identificados 12 diagnósticos de Enfermería, clasificados en 10 reales y dos potenciales, per los 100% pertenecían a la necesidad humana básica psicobiológica. **Conclusión:** No se identificó diagnóstico para las necesidades psicosocial y psicoespiritual. Según Horta, el paradigma biologicista conlleva a fragmentar el paciente, manteniendo al enfermero alienado y contrario a la pragmática centrada en el holismo.

Palabras clave: Diagnóstico de enfermería. Trasplante de corazón. Enfermería perioperatoria. Teoría de enfermería.

[1]PhD in Nursing; Assistant Teachers in the Basic Nursing Department of the School of Nursing of Universidade Federal de Minas Gerais (UFMG). E-mail: selmesilqueira@gmail.com; afferraz@terra.com.br; drgilberto.guimaraes@hotmail.com; vaniagoveia@ufmg.br; isabelyovana@ufmg.br
Vania Regina Goveia. Avenida Professor Alfredo Balena, 190. CEP: 30130-100. Belo Horizonte (MG), Brasil. Telefone: (31) 3409-9886.
[2]PhD in Nursing; Associate Professor in the Basic Nursing Department of the School of Nursing of UFMG. E-mail: saletesilqueira@gmail.com
[3]PhD in Nursing; Professor in the Basic Nursing Department of the School of Nursing of UFMG. E-mail: taniachianca@gmail.com
[4]PhD in Nursing; Emeritus Professor in the Basic Nursing Department of the School of Nursing of UFMG. E-mail: dacle@enf.ufmg.br
*Data extracted from the doctoral thesis of the 1st author, entitled "Nursing diagnosis in patients in mediate postoperative period of heart transplant and validation of diagnosis considered most characteristic: spiritual anguish", defended in 2009 at the School of Nursing of Universidade Federal de Minas Gerais - Belo Horizonte (MG), Brazil.
Received: 12 Aug. 2015 – Approved: 17 Sep. 2015.
DOI: 10.5327/Z1414-4425201500040007

INTRODUCTION

Heart transplantation is performed when the probability of a lifespan is greater in the surgical treatment than the clinical treatment. It is a complex procedure that has organic, social and psychological impacts on the patient, which implies the need for specialized care[1].

Thus, the heart transplant patient, in the mediate postoperative period beginning 24 hours after surgery, demands mediate and accurate professional actions from nurses, which require scientifically-based planning. Thus, the nursing care as a result of professional action should move nurses to act in a lucid, reflective way, in a technically and humanistically competent manner, because this care is critical to patient recovery[2,3].

The nurse is the professional required to coordinate and implement health care, from meeting the patient's basic human needs (BHN), aiming at their better response to treatment. Therefore, it is up to this professional to seek technical, scientific and humanistic improvement to tend to the patient's needs[4].

The search for this improvement moves the nursing professionals to surround themselves with care alternatives, through a characteristic work methodology, which is based on the scientific method, expressed by the Systematization of Nursing Assistance (SEA). It is being implemented in the healthcare practice and provides greater security to patients, improves the quality of care and ensures autonomy to the professionals, as it enables them to organize the work and operate the nursing process (NP)[1].

The NP is part of a set of actions that express the nurses' way of acting and thinking towards the patient and his family, with regard to health promotion, prevention and treatment of disease. It consists of five interdependent steps, namely: data collection or Nursing history; Nursing diagnosis (ND); planning; implementation and evaluation of Nursing. This constitutes the methodological tool that guides Nursing care[4].

In addition, the NP must be based on a theoretical framework to guide data collection, the establishment of the ND and intervention planning. It should also provide data for the evaluation of results.

In this study, the philosophical presuppositions of Wanda de Aguiar Horta were used to guide it[4,5], which are based on Maslow's Theory of Human Motivation, whose primary concept is the hierarchy of the BHN. These are arranged in five levels of priority, outlined from the most basic to the most complex, namely: physiological needs, safety and security, love and gregariousness, self-esteem and self-actualization. Nursing employs the proposition by John Mohana, which ranks the BHN in: psychobiological, psychosocial and psycho-spiritual[5].

The conjectures by Horta allow nurses to reflect upon and move towards a healthcare practice centered around understanding the patient as a person, as well as stimulating their participation as subjects of the therapeutic plan and contributing to the production, further development and expansion of the knowledge on Nursing[1,5].

Thus, among the steps of the NP, the ND is recognized as a guide for the remaining steps, as it represents the basis for the selection of the actions towards the expected results. It is drawn from the interpretation and collation of the data collected and culminates in the decision-making process about diagnostic concepts, which express the answers of the patient, family or community on the health versus disease binomial[3-5].

It is understood that knowing the diagnostic profile of patients is relevant to the nursing care because the ND is the guiding principal for the remaining steps of the NP. Thus, this study aimed to identify the profile of the ND in heart transplant patients in the mediate postoperative period based on the Taxonomy II of the North American Nursing Diagnosis Association (NANDA) and discuss them in light of Horta's assumptions and the scientific literature[5,6].

METHODS

This is a descriptive, exploratory and retrospective study. The scenario was the Intensive Care Unit (ICU) of a large general hospital, located in Belo Horizonte, Minas Gerais, whose staff had 20 specialist nurses who cared to patients in the postoperative period of cardiac surgery, including cardiac transplants. The ICU nurses were responsible for the drafting of the Nursing history and the for the formulation of the ND in their respective work shifts. The population consisted of 60 medical records of heart transplant patients in the mediate postoperative period, which that occurs after the first 24 hours, lasting about 2 to 10 days[7].

Sociodemographic data and the ND were collected from medical records of patients who underwent heart transplantation and recorded on an instrument previously developed for this purpose. The data collection phase lasted three months and included transplant patients over a period of 48 months from the implementation of the NP in the unit. The ND with a reliability rate of 70% were included in the study, which was understood as a measure of agreement between the diagnostic findings of two or more nurses — in this case, between the researcher and the hospital nurses, using the same data from the records of patients in the mediate postoperative period after a heart transplant. Data analysis was performed using descriptive statistics and discussed in the light of Horta's assumptions on the scientific literature[5,8].

Inclusion criteria were adults of both sexes, aged ≥18 years and <60 years, who underwent a heart transplantation procedure, in the mediate postoperative period, admitted to the ICU. Exclusion criteria were patients with serious complications in the immediate postoperative period (<24 hours) such as: global graft dysfunction, pulmonary hypertension with use of intra-aortic balloon, hypocontractility with low cardiac output and acute renal failure; patients who had no Nursing history and evolution in the medical record. After the application of the criteria, the sample consisted of 49 records.

The study was approved by the Research Ethics Committee of Universidade Federal de Minas Gerais (UFMG), under protocol no. ETIC 397/06, according to Resolution 196/96, revoked by Resolution 466/12 of the National Health Council, protecting the anonymity of the persons undergoing treatment and of the professionals who issued the ND.

RESULTS

The results are presented by the characterization of the patients who underwent heart transplantation and the distribution of ND given by nurses in the mediate postoperative period.

Table 1 shows that among the 49 patients undergoing heart transplantation, 67.3% were male; ages ranged between 18 and 60 years; 77.6% were married and 59.2% were Catholic Christians. As for education level, 65.3% had primary education and 8.2% had higher education.

Concerning the ND, 12 diagnoses were listed, and are classified into real (n=10) and potential (n=2). Among the real are: impaired bed mobility; ineffective protection; impaired gait; impaired tissue integrity, attributed to 100% of the heart transplant patients; imbalanced nutrition, less than body requirements, in 93.9% of patients; decreased cardiac output in 87.7% of them; acute pain in 83.7%; impaired gas exchange and ineffective breathing pattern attributed to 79.6%; in addition, impaired urinary elimination was attributed to 73% of subjects. Among the potential diagnoses are: risk of infection assigned to 100% of the patients and risk of constipation to 77.5%.

When evaluating the ND and identifying the BHN affected, it was shown that 100% of them concerned the psychobiological needs. Therefore, there was no identification of diagnoses for psychosocial and psycho-spiritual needs, as shown in Table 1.

Table 1. Frequency distribution of heart transplant patients, according to sociodemographic data, in Belo Horizonte, 2009.

Variables	n	%
Sex		
Male	33	67.3
Female	16	32.6
Age		
18 to 30 years	6	12.2
31 to 40 years	13	26.5
41 to 50 years	16	32.7
51 to 60 years	14	28.6
Marital status		
Single	3	6.1
Married	38	77.6
Other	8	16.3
Education		
Primary education	32	65.3
Secondary education	9	18.3
Higher education	4	8.2
Not informed	4	8.2
Religion		
Catholic	29	59.2
Evangelicalism	13	23.5
Spiritism	3	8.1
Not informed	4	9.2

DISCUSSION

This topic was organized into two sections: in the first, the analysis of the classification of the ND in heart transplant patients in the mediate postoperative period in the light of Horta's assumptions. Then, these diagnoses were discussed according to NANDA's Taxonomy II and the scientific literature[5,6].

Analysis of the classification of nursing diagnoses in heart transplant patients in the mediate postoperative period in the light of Horta's assumptions

There was a predominance of male patients aged between 41 and 60 years, and in relation to education, the majority had elementary school, a condition that favors the patient's social vulnerability, which could compromise their adherence to the treatment plan. Such situations should arouse in the nurse the clarity of their role as a health educator, aiming to establish actions with the patient that guide them to personal growth and development[9].

The ND were classified according to Horta's assumptions regarding the psychobiological BHN. The data revealed a trend by nurses to highlight this aspect at the expense of psychosocial and psycho-spiritual aspects. This fact stems from the prevailing understanding that life ends in the biological dimension, in addition to the highest valuation given to technological advances promoted by science[5,10].

Chart 1. Distribution of nursing diagnoses according to related or risk factors, defining characteristics and basic human need affected.

Nursing Diagnoses	Related or risk factors	Defining characteristics	Basic human need affected
Impaired bed mobility	Major surgery	Impaired immunity; impaired healing	Psychobiological
Ineffective protection	Inadequate nutrition, immunosuppression	Impaired immunity; impaired healing	Psychobiological
Impaired gait	Mediate postoperative period for major surgery (2 to 10 days)	Impaired ability to walk	Psychobiological
Impaired tissue integrity	Surgical procedure	Invasion of body structures (breaking of the dermis and epidermis)	Psychobiological
Imbalanced nutrition, less than body requirements	Inability to eat or drink food or absorb nutrients, caused by prior congestive heart failure, pain, anxiety or nausea	Body weight 20% or more below the ideal. Account of lower food intake than the recommended daily portion; lack of interest in food	Psychobiological
Decreased cardiac output	Altered heart rate	Fatigue, oliguria, edema, arrhythmia	Psychobiological
Acute pain	Major surgical procedure, invasive	Verbal or coded reporting; evidence observed by facial expression; changes in appetite and food; position to avoid pain	Psychobiological
Impaired gas exchange	Imbalanced ventilation-perfusion	Restlessness, drowsiness, shortness of breath, confusion or irritability	Psychobiological
Ineffective breathing pattern	Body position, fatigue, anxiety, decreased energy or pain	Beating of the ala of nose; dyspnea; use of accessory muscles to breathe and imbalanced ventilation-perfusion	Psychobiological
Impaired urinary elimination	Surgical anesthesia, urinary tract infection	Urinary retention and dysuria	Psychobiological
Risk of infection	Immobilization in bed	–	Psychobiological
Risk of constipation	Invasive procedures, malnutrition, immunosuppression, chronic disease, increased environmental exposure to the pathogen	–	Psychobiological

Thus, influenced by the advances of modern science, the nursing profession uses the scientific technical view. This perspective is philosophically grounded, especially marked by the separation of the knowledge obtained from objectivity and subjectivity, and therefore, the biologicist aspect is considered foundational to the Nursing care practice[11].

This paradigm comes from Positivism and, for this philosophical current, science is objective; therefore, human subjectivity is not valuated. Such influence was evidenced in this study because, due to the complexity of human existence, the nurse sub-categorized ND to psychosocial and psychospiritual BHNs[5,11].

Of course, the importance of the biological aspect as founder and sustainer of human life cannot be ignored; however, Horta's views is that life is not defined only by it, because the patient aspires to be worth in their entirety, that is, to be recognized as a person[5,11,12].

Another relevant aspect of the biologicist paradigm is the anthropological concept claimed by it. In it, the human being is perceived as a machine, which implies the loss of health in the individual, strictly identified as an operational failure, subject to correction, maintenance and adjustment. It is inferred, therefore, that the state of alienation experienced by nurses should not be analyzed from the perspective of lack of skills or competencies to identify diagnoses that are beyond the psychobiological level. However, it lies in the deformed vision of the human dimension in their social, political and ethical aspects[10].

In contemporary times, the influence of the separation between objectivity and subjectivity is clear, notably in the hospital setting. In that setting, scientific objectivity is manifested from professional specialization; fragmentation in the work processes; priority in the valuation of technical knowledge; increasing use of technologies and innovations in terms of equipment, medicines, at the expense of the valuation of the aspects that involve knowledge from subjectivity. These elements characterize the setting surrounding the care of patients undergoing heart transplantation. On the unit where they spend the mediate postoperative period, technological advances and the professional expertise of nurses are notorious[9].

Historically, the Brazilian Nursing activity, in the healthcare and educational aspect, has been marked by its closeness to the biomedical model, which exacerbates the biologicist aspects in its professional training. Consequently, the biologicism amalgamates the worldview of nurses, moving them to care for patients in a fragmented way. This characteristic builds on the anthropological concept of man as a machine[5,11].

Overcoming this inherited biologicist paradigm will cause the awakening of the nurse to the recognition of the patient's subjective dimension, giving nurses the ability to identify the ND to psychosocial and psychospiritual BHNs. This will cause the transformation of nurses, allowing the planning of the nursing care, intrinsically valuable, by seeing the patient as a person[5].

In this way, it is up to the nurse, in the exercise of the NP, to keep their attitudes critical and reflective. They can thus overcome the hegemonic biologicist vision influencing the profession today, and will then reaffirm the integrity that characterizes the patient, valuing the psychobiological, psychosocial and psychospiritual needs[5].

Thus, what science divided is reintegrated, and assumes a new anthropological concept based on holism. In it, man is an indivisible, dynamic whole, in constant interaction with the environment. This endeavor begins at the birth, culminating in death. Such a concept is a basic element of Horta's assumptions and should constitute the fulcrum used by nurses to subsidize the healthcare practice[5,13].

Nursing Diagnoses in heart transplant patients in the mediate postoperative period according to NANDA's Taxonomy II

Real and potential ND relate to the fields of disposal or exchange, activity or rest, safety or security, nutrition and comfort[6].

The diagnoses of impaired bed mobility and gait, as well as the risk of constipation, are closely related to each other. This fact focuses on the sharing of related risk factors, based on major surgery and immobilization in bed. About 30-60% of patients admitted to ICU after surgery developed generalized weakness related to immobility. Stimulation and conducting exercises in bed are essential components of the Nursing care, from the realization of bed baths, changing positions, among others, and enable nurses to participate in the fight against immobility[14,15].

Such developments, in synergy with other health professionals, promote physical benefits (e.g., stimulation of intestinal peristalsis, muscle strengthening, pressure ulcer prevention, among others), maintaining the patient's

mental health, reducing oxidative stress and inflammation, because performing exercises in the bed, whether active or passive, stimulate the increased production of anti-inflammatory cytokines[14,15].

Thus, early mobilization of the patient has been identified as an effective intervention to reduce physical weakness and, when associated with the correct positioning in bed, to avoid physical disabilities, weakness of the respiratory, abdominal and peripheral muscles, and to provide patient interaction with their environment, working their motor, cognitive and psychological stimulation[14,15].

The diagnosis of impaired tissue integrity and risk of infection were common to, as related or risk factors, the performance of invasive surgical procedure. The surgery, in addition to breaking the epithelial barrier, disrupts the arrival of glucose, amino acids and oxygen to the tissue, triggering a series of systemic reactions that facilitate the occurrence of infectious processes[16].

In the surgical site occurs hypoxia, pH change and fibrin deposition. Hypoxia and acidosis hinder the migration of neutrophils and their microbicidal activity; the deposition of fibrin contributes to infection, as bacteria sequesters and modifies the local defense mechanism. In addition to invasive procedures and insufficient primary defense due to surgical trauma, several factors influence the incidence of wound infection, among them: patient's preoperative clinical status (age, nutritional status, chronic diseases, etc.); technical conditions of the surgery; preoperative hospital stay; sequestering and destruction of leukocytes promoted by cardiopulmonary bypass[16].

Therefore, it is up to the nurse to assess the patient's clinical condition daily and prevent potential complications, electing, for example, Nursing interventions related to the supervision of the skin, establishing, among others, the following activities: examining the skin and mucous membranes for redness, excessive heat, edema and draining; observing extremities for color, heat, swelling, pulse, texture, edema and ulcerations; monitoring the skin for excessive drying and moisture[17].

The diagnoses of ineffective protection and imbalanced nutrition, less than body requirements, lower than bodily needs, can be considered as solidarity, that is, the basis on which they sit have, from their defining characteristics, a close relationship. Ultimately, imbalanced nutrition has a synergistic effect on immunity deficiency and results on impaired healing[18].

The patient, due to the cardiovascular bypass, undergoes changes in the body's physiological balance, which is a complex and multifactorial aggressor agent. Blood cells are subject to the action of various forces, which differ from the normal circulation; thus, erythrocytes, leukocytes and platelets are affected by both the physical trauma and the contact with the surfaces of the circuit. Leukocytes are sequestered from the circulation and others are destroyed, lowering the body's defense against infection and releasing inflammatory and pro-oxidative factors, which exert synergism to move the patient to an unbalanced nutritional status and harm the immune defense[16-18].

Therefore, nurses should promote safety and prevent complications, using the Nursing intervention for nutritional monitoring, choosing activities that bring the best benefit to the patient, such as: monitoring the occurrence of nausea, vomiting, pallor, flushing and dryness, as well as redness, swelling and cracks in the mouth/lips[17].

The diagnosis of decreased cardiac output had altered heart rate as a related factor. This is defined as an insufficient amount of blood pumped by the heart to meet the bodily metabolic requirements. A study shows that this diagnosis is also related to lower blood pressure, altered heart rate, arrhythmia, altered central venous pressure, altered left atrial pressure, impaired peripheral perfusion, changes in appearance and oliguria; such factors are shared by this research[19].

Thus, nurses must remain in a state of attention to the manifestation of this condition; to do so, they shall list the Nursing intervention that denotes cardiac care and establish activities that match the patient's care, such as: monitoring cardiovascular status and vital signs often, monitoring the respiratory condition for symptoms of heart failure and the occurrence of dyspnea, fatigue, tachypnea and orthopnoea[17].

The diagnosis of impaired urinary elimination had anesthesia as an associated factor. An investigation shows that acute kidney injury (AKI) is one of the main complications after cardiac surgery and produces decrease in urine volume. This fact is associated with cardiovascular bypass and blood pressure, in addition to the kidney injury mechanism produced by the anesthetic used. The association between the amount of blood components received and the development of AKI during transplantation was also demonstrated[20].

Nurses should keep close attention to the quantitative and qualitative aspects of urinary elimination, and should

also assess the choice of Nursing intervention based on the control of urinary elimination, as well as establish activities, namely monitoring the urinary elimination, including frequency, consistency, odor, volume and color; checking the appearance of signs and symptoms of urinary retention and guiding the patient to verify the presence of symptoms of urinary tract infection[17].

The diagnosis of acute pain was evident from the risk factor 'major surgery, invasive', having as defining characteristics the verbal report, the change in appetite and position to avoid the pain. This results from trauma to the chest wall and ribs, given the incisions, the presence of drains and the retraction of the sternal edges, which can cause fracture or microfracture in the ribs, and intercostal muscle strain. It is up to the Nursing professional to list interventions that can help the patient overcome this condition, either through the administration of medication, or through the non-pharmacological control of pain[21,22].

It is also noteworthy that the pain related to the surgical procedure is associated with noxious stimuli, especially in the sternotomy, changing lung function by upper chest instability. Thoracic and abdominal pain may favor the following losses: tensing of the muscles of the diaphragm and chest wall; hindering of the ability to cough, breathe and move in bed; decreasing the vital and functional residual lung capacity, as well as resulting in atelectasis and pneumonia[21,22].

In this sense, pain control should be a concern of the nurse, for their correct evaluation and conduct promote comfort and well-being and prevent respiratory complications. Thus, the Nursing professional should choose the Nursing intervention for pain control and establish activities that care for the patient, such as controlling environmental factors that may influence a patient's response to discomfort (e.g. temperature, lighting or ambient noises); observing the occurrence of non-verbal factors of discomfort, especially in patients unable to communicate effectively; and investigating with the patient for factors that alleviate or worsen pain[17].

The diagnosis of impaired gas exchange and ineffective breathing pattern had the imbalance between ventilation and perfusion as their intersection point. The defining characteristics listed pointed to the clinical status of sensory, cognitive and mood alterations in the clientele; followed by dyspnea and accessory use of muscles to breathe. Impaired gas exchange and ineffective breathing pattern may be signs of pulmonary complications[15].

Pulmonary complications account for 40% of deaths in patients aged over 70 years and are the second most frequent cause of complications after cardiac surgery. Factors such as prolonged intraoperative time, cardiovascular bypass, general anesthesia, surgical incision, intensity of surgical manipulation or number of drains may predispose to changes in lung function, in addition to the psychological factor, in which the patient believes he can break the suture when breathing or coughing, which may cause changes in respiratory function[15].

Moreover, it is up to the nurses to strive to promote the best conditions of the patient, choosing a Nursing intervention for respiratory monitoring, proposing, among others, the following activities: monitoring the frequency, pace, depth and effort in breathing; checking the occurrence of noisy breathing, such as wheezing, shrill and snoring; verifying the occurrence of fatigue of the diaphragmatic muscles and monitoring the patient's respiratory secretions[17].

CONCLUSION

In conclusion, it can be said that ND were identified for heart transplant patients in the mediate postoperative period, classified in real and potential. As for Horta's assumptions, there were no psychosocial and psycho-spiritual diagnoses. The titles for the diagnoses of psychobiological nature were impaired bed mobility, ineffective protection, impaired gait, impaired tissue integrity, imbalanced nutrition, decreased cardiac output, acute pain, impaired gas exchange, impaired urinary elimination, ineffective breathing pattern, risk of constipation and risk of infection.

The predominance of psychobiological factors made evident the influence of the biologicist paradigm on the professional Nursing practice. This reinforces the need to sensitize nurses about the development and prioritization of a critical and reflective attitude about the care pragmatics, in order to awaken them to the adoption of the anthropological concept based on holism. Only then, they will have the conditions that will enable them to judge the ND that expresses the entirety of the patient, from the identification of BHN in the psychobiological, psychosocial and psycho-spiritual spheres, giving them the recognition of the person, which is a basic concept of Horta's assumptions and a transforming factor in the Nursing practice.

REFERENCES

1. Ribeiro CP, Silveira CO, Benetti ER, Gomes JS, Stumm EM. Diagnósticos de enfermagem em pacientes no pós-operatório de cirurgia cardíaca. Rev Rene [Internet]. 2015 [citado 2015 Jun 5]; 16(2):159-67. Disponível em: http://www.revistarene.ufc.br/revista/index.php/revista/article/view/1953

2. Associação Brasileira de Enfermeiros de Centro Cirúrgico, Recuperação Anestésica e Centro de Material e Esterilização. Práticas Recomendadas SOBECC. 6. ed. São Paulo: Manole; 2013.

3. Vargas RS, França FC. Processo de Enfermagem aplicado a um portador de cirrose hepática utilizando as terminologias padronizadas NANDA, NIC e NOC. Rev Bras Enferm [Internet]. 2007 [citado 2012 Set 20]; 60(3):348-52. Disponível em: http://www.scielo.br/pdf/reben/v60n3/a20.pdf

4. Conselho Federal de Enfermagem. Resolução COFEN n. 358, de 15 de outubro de 2009. Dispõe sobre a Sistematização da Assistência de Enfermagem e a implementação do Processo de Enfermagem em ambientes, públicos ou privados, em que ocorre o cuidado profissional de Enfermagem, e dá outras providências. [Internet]. Brasília; 2009 [citado 2013 Mar 22]. Disponível em: http://novo.portalcofen.gov.br/resoluo-cofen-3582009_4384.html

5. Horta WA. Processo de Enfermagem. São Paulo: EDUSP; 2005.

6. North American Nursing Diagnosis Association. Diagnósticos de Enfermagem da NANDA: definições e classificação (2009-2011). Porto Alegre: Artmed; 2010.

7. Lemos CS, Suriano ML. Desenvolvimento de um instrumento: metodologia de ensino para aprimoramento da prática perioperatória. Rev SOBECC. 2013;18(4):57-69.

8. Batista CG. Concordância e fidedignidade na observação. Psicologia. 1977;3(2):39-49.

9. Guimarães GL, Mendoza IY, Goveia VR, Baroni FC, Godoy SC, Matos SS. Diagnósticos de enfermagem em hemodiálise fundamentados na Teoria de Horta. Rev Enferm UFPE [Internet]. 2014 [citado 2014 Out 30]; 8(10):3444-51. Disponível em: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/6588/pdf_6291

10. Valença CN, Santos RC, Medeiros SM, Guimarães J, Germano RM, Miranda FA. Reflexões sobre a articulação entre o *homo faber* e o *homo sapiens* na enfermagem. Esc Anna Nery Rev Enferm [Internet]. 2013 [citado 2014 Out 30]; 17(3):568-72. Disponível em: http://www.scielo.br/pdf/ean/v17n3/1414-8145-ean-17-03-0568.pdf

11. Santos QG, Azevedo DM, Costa RK, Medeiros FP. A crise de paradigmas na ciência e as novas perspectivas para a enfermagem. Esc Anna Nery Rev Enferm [Internet]. 2011 [citado 2014 Nov 13]; 15(4):833-7. Disponível em: http://www.scielo.br/pdf/ean/v15n4/a24v15n4.pdf

12. Stein-Backes D, Stein-Backes M, Lorenzini-Erdmann A, Büscher A, Salazar-Maya AM. Significado da prática social do enfermeiro com e a partir do Sistema Único de Saúde brasileiro. Aquichan [Internet]. 2014 [citado 2015 Jun 15]; 14(4):560-70. Disponível em: http://www.scielo.org.co/pdf/aqui/v14n4/v14n4a10.pdf

13. Frazão CM, Araújo AD, Lira AL. Implementação do processo de enfermagem ao paciente submetido à hemodiálise. Rev Enferm UFPE [Internet]. 2013 [citado 2014 Fev 20]; 7:824-30. Disponível em: http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/3335/pdf_2349

14. Bax AM, Araújo ST. Expressão não verbal do paciente no cuidado: percepção do enfermeiro em unidade cardiointensiva. Esc Anna Nery Rev Enferm [Internet]. 2012 [citado 2014 Fev 20]; 16(4):728-33. Disponível em: http://www.scielo.br/pdf/ean/v16n4/12.pdf

15. Mussalem MA, Silva AC, Couto LC, Marinho L, Florencio AS, Araújo VS, et al. Influência da mobilização precoce na força muscular periférica em pacientes na Unidade Coronariana. Assobrafir Ciência [Internet]. 2014 [citado 2014 Out 10]; 5(1):77-88. Disponível em: http://www.uel.br/revistas/uel/index.php/rebrafis/article/view/17530/14460

16. Galdeano LE, Rossi LA, Nobre LF, Ignácio DS. Diagnóstico de enfermagem de pacientes no período transoperatório de cirurgia cardíaca. Rev Latino-am Enferm [Internet]. 2003 [citado 2014 Out 10]; 11(2):199-206. Disponível em: http://www.scielo.br/pdf/rlae/v11n2/v11n2a09.pdf

17. Bulechek GM, Butcher HK, Dochterman JM. Classificação das intervenções de Enfermagem NIC. 5. ed. Rio de Janeiro: Elsevier; 2010.

18. Okoshi MP, Romeiro FG, Paiva SA, Okoshi K. Caquexia associada à insuficiência cardíaca. Arq Bras Cardiol [Internet]. 2013 [citado 2014 Out 10]; 100(5):476-82. Disponível em: http://www.scielo.br/pdf/abc/v100n5/aop5041.pdf

19. Fidelis CS, Moraes ED, Bezerra ML, Chaves RG, Nunes SF. Diagnóstico de enfermagem segundo a taxonomia II da NANDA de pacientes internados em uma unidade de terapia intensiva em Imperatriz, Maranhão, Brasil. J Manag Prim Health Care [Internet]. 2013 [citado 2015 Fev 20]; 4(3):151-7. Disponível em: http://www.jmphc.com/ojs/index.php/01/article/view/151/102

20. Santos JC, Mendonça MA. Fatores predisponentes para lesão renal aguda em pacientes em estado crítico: revisão integrativa. Rev Soc Bras Clin Med [Internet]. 2015 [citado 2015 Jul 1]; 13(1):69-74. Disponível em: http://files.bvs.br/upload/S/1679-1010/2015/v13n1/a4780.pdf

21. Faria Filho GS, Caixeta LR, Stival MM, Lima LR. Dor aguda: julgamento clínico de enfermagem no pós-operatório de cirurgia cardíaca. Rev Min Enferm. 2012;16(3):400-9.

22. Novaes ES, Torres MM, Oliva AP. Diagnósticos de enfermagem em clínica cirúrgica. Acta Paul Enferm [Internet]. 2015 [citado 2015 Jul 1]; 28(1):26-31. Disponível em: http://www.scielo.br/pdf/ape/v28n1/1982-0194-ape-028-001-0026.pdf