RESEARCH ASSESSMENT – NEW HORIZONS

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Research investment has been increasing each year. Governments and research support foundations have been estimated to invest around US$1.4 trillion in scientific research around the world per year[1]. Such numbers lead to important questions: where can we focus our investments? What studies can we fund? The answers for these questions are based on the metrics of scientific quality and productivity assessment, with the aim of identifying scientific researchers and projects with merit to receive such financial supports[2].

Currently, research assessment is based on the publication and citation counts, considering the impact factor (IF) of published journals and their derivatives such as the h-index. The IF is frequently used as a primary parameter to compare the scientific production of researchers and institutions; it was initially created as a tool to help librarians identifying the journals that would be acquired, but not like a measure of scientific quality of a manuscript research[3]. Investigators have documented several limitations of using this metric tool to assess the research quality. These vary from biased citations in journals to the specificity of IF proprieties of the working field, which include articles with several methods of investigation, fragility of the editorial policy that can be manipulated, absence of transparency, and public access to data used for calculating the IF[2-5].

The need of improving research assessment and criteria used by fund support agencies made that groups of researchers and scientific editors gathered to talk about alternative strategies. One of these groups, comprising editors of academic journals from the Cellular Biology area, was formed during the Annual Meeting of the American Society of Cellular Biology, in San Francisco, California, in 2012. It elaborated a series of recommendations known as San Francisco Declaration on Research Assessment (DORA), a document signed by more than 150 scientists and 75 academic organizations[2]. The recommendations of DORA are aimed at research funding agencies, academic institutions, journals, organizations that provide metrics and investigators in general. They are based on the need of eliminating the use of metrics such as IF and h-index in obtained financial supports, commitment, and investigator's promotion considerations. Also, they are based on the need of assessing the research through its merit and not through that of the journal where it was published, and on the need of capitalizing on the opportunities offered by the online publication.

Marcia McNutt, editor-in-chief from the journal *Science*, in her Editorial from November 2014, approaches and criticizes the emphasis given to literature measurements, which, in her opinion, "misrepresent the process and do not allow distinguishing qualified candidates." She also suggests that young scientists should be assessed through their availability to taking risks, ability of working together in different teams, through the resolution of complex problems with innovative and creative solutions, and also through their ethical behavior since the experiment until the publication of results[1].

Uneasiness with the current used metrics is increasingly mobilizing investigators, and alternative measurements are gaining more followers among the most well-known scientists in all areas of knowledge.

This is a new scenario where young investigators may be closer to equality of conditions with senior investigators in the evaluation of their projects, if they are able to show innovation, commitment, ability to work in groups, and ethics.

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EXPOSURE OF NURSING STAFF TO RADIATION IN THE OPERATING ROOM: A DESCRIPTIVE STUDY

Exposição da equipe de Enfermagem à radiação em centro cirúrgico: um estudo descritivo

La exposición del personal de Enfermería a la radiación en la sala de operaciones: un estudio descriptivo

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ABSTRACT: Objective: To determine radiation exposure of the nursing staff in the Surgical Centers of seven hospitals in six countryside cities of São Paulo State, Brazil. **Method:** We conducted a quantitative and descriptive study through interviews with nurses working for over a year in operating rooms of seven units belonging to six cities. **Results:** Thirty employees were interviewed, all of whom were women; 8 (26.7%) were older than 40 years, 25 (83.3%) were nursing technicians, and 14 (46.7%) had been working in the Surgical Center from 1 to 5 years. Of these, 28 (93.3%) reported contact with radiation and only 11 (39.3%) used some type of protection, only 2 (7.1%) were using a dosimeter, and 25 (89.3%) did not have different salaries because of dangerousness degree of their activities. **Conclusion:** The radiological protection standards are not strictly enforced by the institutions included in the study.
KEYWORDS: Nursing. Operating room nursing. Occupational health nursing. Occupational health. Radiation, nonionizing.

RESUMO: Objetivo: Verificar a exposição à radiação da equipe de Enfermagem nos Centros Cirúrgicos de sete hospitais de seis cidades do interior do Estado de São Paulo. **Método:** Realizou-se um estudo quantitativo e descritivo, por meio de entrevista dos profissionais de Enfermagem, atuantes há mais de um ano em sete unidades dos Centros Cirúrgicos pertencentes a seis cidades diferentes. **Resultados:** Foram entrevistados 30 funcionários, sendo que todos pertenciam ao sexo feminino, oito (26,7%) tinham mais de 40 anos, 25 (83,3%) eram técnicos de Enfermagem e 14 (46,7%) atuavam em Centro Cirúrgico entre um e cinco anos. Destes, 28 (93,3%) relataram contato com radiação e apenas 11 (39,3%) utilizavam algum tipo de proteção; apenas dois (7,1%) faziam uso do dosímetro e 25 (89,3%) não possuíam remuneração diferenciada devido ao grau de periculosidade de suas atividades. **Conclusão:** As normas de proteção radiológica não são rigorosamente cumpridas pelas instituições incluídas neste estudo.
PALAVRAS-CHAVE: Enfermagem. Enfermagem de centro cirúrgico. Enfermagem do trabalho. Saúde do trabalhador. Radiação não ionizante.

RESUMEN: Objetivo: Determinar la exposición a la radiación del personal de Enfermería de quirófano en siete hospitales en seis ciudades del interior del estado de San Pablo, en Brasil. **Método:** Estudio cuantitativo y descriptivo, a través de entrevistas a enfermeras que trabajan durante más de un año en el quirófano en siete unidades pertenecientes a seis ciudades diferentes. **Resultados:** Se entrevistaron a 30 empleados, todos los cuales eran mujeres, ocho (26,7%) tenían más de 40 años, 25 (83,3%) eran técnicas de Enfermería y 14 (46,7%) trabajaban en el Centro de Cirugía entre uno y cinco años. De ellos, 28 (93,3%) informaron contacto con la radiación y sólo 11 (39,3%) utilizaban algún tipo de protección, sólo dos (7,1%) estaban usando un dosímetro y 25 (89,3%) no tenían salarios diferentes por el grado de peligrosidad de sus actividades. **Conclusión:** Las normas de protección radiológica no son estrictamente cumplidas por las instituciones incluidas en el estudio.
PALABRAS CLAVE: Enfermería. Enfermería de quirófano. Enfermería del trabajo. Salud laboral. Radiación no ionizante.

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INTRODUCTION

Many hospital units, especially the Surgical Center (SC), contain equipment that emits radiation and exposes employees, especially the medical and nursing teams, to its associated risks.

The ionizing radiation is the one that comes from this type of equipment, defined as an electromagnetic particle that, after getting in touch with matter, removes electrons from the atoms and molecules, changing them into ions. On the basis of this definition, some examples of ionizing radiation are alpha, beta, and gamma particles, emitted by sources of radiation such as X-ray devices[1].

In SC units, C-arm and X-ray devices use this harmful radiation, which are necessary for neurosurgeries, orthopedic interventions, and vascular and heart surgeries.

In comparison to the United States, Brazil still lacks investigations on the effects of radiation and radiological protection.

However, the Ministry of Health officially acknowledges that many diseases can be related to the ionizing radiation exposure, such as malignant tumors of the nasal cavity, bronchi, lungs, and skin; thyroid cancer; bone sarcoma; leukemia; myelodysplastic syndrome; bone marrow hypoplasia; purpura and other hemorrhagic manifestations; agranulocytosis; radiation-induced polyneuropathy; gastroenteritis; male infertility; and other acute effects of radiation[2].

When a person is exposed to high doses of radiation, most of the cells are affected, thus preventing the maintenance of life. However, the effects of exposure to low doses of radiation are still not clear because they can be masked by the genetic predisposition to some diseases, as is the case of cancer[3].

Besides the dose of radiation the body is exposed to, the effects of ionizing radiation depend on the rate of absorption, the characteristics of exposure (either acute or chronic), and the type of affected tissue. Therefore, the consequences are not considered so severe if the received dose is fractioned in small amounts for a long period, thus giving the affected cells a chance to regenerate between one dose and the next[3].

However, aiming at radiological protection, it is best to consider that any radioactive dose received, regardless of being low or high, is directly related to the occurrence of damage to health[3].

Therefore, the radiation doses received by a person are evaluated with a dosimeter, which is an individual monitor able to measure the effective dose of radiation received by the subject while staying in risk areas, or during work hours, thus enabling us to assess if the values of exposure are within the limits established by law to preserve the health of the employee[1].

Respecting the limits of received radiation doses is an important matter in radiological protection programs. However, according to the International Commission on Radiological Protection (ICRP), these levels are often not followed in the health field, both for employees and for patients[4].

According to the ICRP, the limit for the occupational radiation dose is up to 20 millisievert (mSv) a year. The National Council on Radiation Protection and Measurements (NCRP), which provides the limits of occupational doses for specific organs or tissues, establishes that the annual dose of received ionizing radiation is up to 50 mSv[5].

Therefore, before a member of the team begins performing activities that involve being exposed to ionizing radiation, it is important to elaborate a specific radioprotection plan, one that contains the characteristics, the methods of storage and transportation of the radioactive source, the calculation memory of location and the relationship of the accessories and instruments, and the plan of action to be used in emergency situations[6].

It is also worth mentioning that, while the employee is exposed to radiation, not only the individual dose of received ionizing radiation must be monitored, but also the surrounding areas when the emitter source is activated. The activity must be immediately interrupted and the source must be removed in case exposure is superior to the limit established by the National Commission for Nuclear Energy (CNEN)[6].

The use of ionizing radiation in the hospital environment symbolizes major progress in the health field. However, it has to be used properly, under completely safe conditions, to ensure full protection to health professionals, the public, and the environment against the harmful effects of radiation. However, studies that evaluate the characteristics associated with the exposure to ionizing radiation among health professionals, especially nursing professionals, are still scarce in the national literature. Therefore, it is necessary to know this reality.

OBJECTIVES

The objectives of this study were:

- to verify the exposure to radiation among nursing staff working in SC units of seven hospitals, coming from six countryside cities in the state of São Paulo;
- to define the profile of the SC worker exposed to radiation, in seven hospitals from six countryside cities in São Paulo;
- to describe the time of daily/annual exposure to radiation to which the nursing staff working in SC units of hospitals in the countryside of São Paulo is exposed; and
- to verify the existence of payment connected to the level of dangerousness involved in the working activities of employees from the nursing staff working in SC units in hospitals in the countryside of São Paulo.

METHOD

A quantitative study, with nonexperimental, prospective, and descriptive design was conducted in seven hospitals located in six countryside cities of the state of São Paulo, which had SC units and used radiation-emitting devices.

The participants of the study signed the informed consent form, after the researcher provided them with information regarding the objectives of the study, clarifying that they could give up at any time and that they would not be submitted to any type of risk or damage.

The nonprobability convenience sample was chosen and included all nursing employees (nurses, technicians, and nursing auxiliaries) who accepted to take part in the investigation by signing the informed consent and who had been exposed to radiation in their work activities, working in an SC for at least a year.

Data were collected by the researchers through interviews conducted from February to March, 2013, using one data collection instrument that included information on professional category and sociodemographic characteristics, time of work in the SC area, use of radioprotection equipment, frequency of exposure to radiation, and receiving wage benefits for insalubrity.

The instrument for data collection was submitted to apparent and content validation by professionals in the health field, experienced in SC and occupational health. The judges evaluated the instrument as to its ability to achieve the objectives proposed in the research. The evaluators suggested minor changes, which were accepted.

The data collected were descriptively analyzed, and there was also a mathematical-statistical analysis using absolute numbers, mean, and percentage.

The study met national guidelines established in resolution 466/2012, from the National Health Council[7], and international principle of human research ethics, being approved under number CAAE 12324813.7.0000.5503.

RESULTS

The research counted on the collaboration of 30 professionals in the nursing staff, working in SC units from seven hospitals, located in six countryside cities in the state of São Paulo. Therefore, 33% nursing professionals working in the included SC units agreed to participate in the investigation.

All individuals were women, and 8 (26.7%) subjects were older than 40 years. Most participants (25 or 83.3%) were nursing technicians, and 14 (46.7%) had worked in an SC for 1–5 years (Table 1).

Almost all of the interviewed employees reported having contact with radiation-emitting equipment, such as X-ray devices and C-arms (28 or 93.3%); 26 (86.7%) subjects declared that the walls in the operating room (OR) were not coated with radioprotection material (Table 2).

Among the 28 employees who reported having contact with radiation, only 11 (36.7%) mentioned the use of radioprotection equipment, wearing the thyroid protection collar, and the lead apron in 7 (23.3%) cases. As to weekly contact with radiation, the answers varied because they were presented according to the surgery shift of the services in which the employees were working (Table 3).

The regular use of the dosimeter was mentioned by only 2 (7.1%) of the individuals, and only 3 (10.7%) reported earning differentiated wages due to the frequent contact with radiation (Table 3).

Only 1 (3.6%) interviewee mentioned health problems caused by the excessive exposure to ionizing radiation, referring "back pain" as a factor associated to that condition. However, only 7 (25.0%) professionals who

reported having contact with radiation undergo routine examinations (Table 3).

Finally, participants who claimed to be exposed to radiation were asked about a shift, which maintained fixed employees to work in surgeries that use radioactive devices; 6 (21.4%) employees worked on a differentiated shift from Monday to Friday, and only 4 (14.3%) mentioned the shift was also established on weekends (Table 3).

Table 1. Distribution of the sociodemographic variables of the investigated subjects

Variables	n	%
Sex		
Male	–	–
Female	30	100.0
Age (years)		
22–25	6	20.0
26–30	5	16.7
31–35	7	23.3
36–40	4	13.3
Older than 40	8	26.7
Professional category		
Nursing auxiliary	2	6.7
Nursing technician	25	83.3
Nurse	3	10.0
Time of work (years)		
Less than 1	3	10.0
1–5	14	46.6
6–10	6	20.0
11–15	2	6.7
16–20	1	3.3
More than 20	4	13.3

Table 2. Distribution of interviewees according to type of exposure to radiation

Variables	n	%
Use of X-rays and/or C-arm		
Yes	28	93.3
No	2	6.7
Wall of the operating room coated with radioprotection material		
Yes	2	6.7
No	26	86.7
I don't know	2	6.7

Table 3. Distribution of the variables associated with the occupational exposure to radiation

Variables	n	%
Use of protection		
Yes	11	39.3
No	17	60.7
Type of protection		
Only apron	2	18.2
Apron and collar	7	64.6
Apron, collar, and glasses	2	18.2
Frequency of contact with radiation		
Variable	8	28.6
Once a week	6	21.4
Twice a week	3	10.7
Three times a week	6	21.4
Four times a week	4	14.3
Five times a week	1	3.6
Use of the dosimeter		
Yes	2	7.1
No	26	92.9
Differentiated payment (insalubrity)		
Yes	3	10.7
No	25	89.3
Periodical exams		
Yes	7	25.0
No	21	75.0
Health problem related to working in a surgical center		
Yes	1	3.6
No	27	96.4
Differentiated shift to "take turns" in surgeries using radiation during the week		
Yes	6	21.4
No	22	78.6
Differentiated shift to "take turns" in surgeries using radiation during the weekends		
Yes	4	14.3
No	24	85.7

DISCUSSION

This study comprised nursing professionals working in seven SC units, in six countryside cities in the state of São Paulo. Despite the limitations regarding the number of included subjects, it is worth to mention that these professionals represented, in average, 33% of the nurses working in the SC units included in this investigation, considering the totality of health institutions available in the analyzed region.

The results of this study pointed out to the nonuse of protection devices by most of the participants, as well as the lack of differentiated payment for insalubrity, which shows the lack of awareness of these professionals in relation to their occupational rights and risk to health caused by excessive exposure. Another important aspect is that most members in the nursing team included in this investigation have been working in SC units for 1–5 years; therefore, it is possible to consider that, if there was exposure, as mentioned by the interviewees, this is a recent period and may not yet have caused damaging effects to their health.

However, it is worth to emphasize that, during interviews, only one employee mentioned presenting a health problem caused by exposure to radiation, referring "back pain." This aspect leads us to the following reflection: the probable unawareness regarding the damages to health caused by exposure to radiation, as well as its more frequent signs and symptoms, which shows the lack of preparation, associated with the poor education for work, because not only this employee but most interviewees refer as to the nonuse of protection, such as the apron and the thyroid protection collar.

However, this aspect also reinforces another occupational risk to which nursing workers are exposed, that is, the development of osteomuscular conditions resulting from the characteristics of the work activity, such as the manipulation of heavy weight by a team that is predominantly composed of female members; then, back pain stands out often in this population[8].

Brazil has guidelines for radiological protection that defend the health professional against ionizing radiation exposure. Among them, Ordinance no. 453/98 established basic guidelines for radiological protection[9], and the CNEN, by NN 3.01/11, defines them for those who are exposed to ionizing radiation[10].

In this sense, the Ministry of Labor and Employment, by Regulation 32 (NR 32), which approaches matters of safety and health in Health Services, refers to situations of exposure to physical agents, such as ionizing radiation in the workplace[11].

Even though the law exists, the results in this study show that employees are unaware of the risks to which they are submitted during radiation exposure. Besides, the occupational rights to protection, in relation to ionizing radiation, have been observed to be ignored by health institutions. It is important to point out that radiological protection is necessary whenever radiation is used[5].

The lack of awareness regarding the risks associated with the exposure to radiation among the professionals may be one of the factors explaining its negligent use. Therefore, the scientific literature emphasizes the importance of providing the team with safety trainings against radiation[12].

It is mentioned that the unawareness of the risks associated with radiation is not dependent on the class of the health workers, which may be proven by an investigation conducted with resident doctors of urology, observing that half the interviewees did not know that some devices could cause cancer. The authors concluded that the level of awareness regarding ionizing radiation was very low in the studied sample, as well as the knowledge about the importance of protection against the ionizing radiation, therefore emphasizing the need for the medical team to attend safety courses for working with radiation[13].

This aspect should also be expanded to courses addressed to the nursing staff. Then, students would get more detailed orientation as to the necessary care around radiation-emitting sources, thus raising awareness about the involved risks for themselves and the patients.

The adoption of procedures to reduce radiation exposure, such as protection devices, leads to a significant reduction in mortality and morbidity of the tissues that are sensitive to radiation, such as the thyroid and the eyes[12].

To reaffirm the mentioned aspect, a previous experimental study tried to measure the exposure to radiation coming from the C-arm in relation to susceptible organs, in a mannequin with dosimeters installed in the eyes, thyroid, chest, hands, and gonads, simulating the situation of a surgeon during a back surgery procedure. The authors measured the radiation emitted by the device and received

by the mannequin in four positions that are conventionally used in such surgical procedures. The results showed that the longer the distance from the emitting source, the lower the radiation doses received; these are always higher on the hands of the surgeon, when compared to the other assessed organs. Besides the hands, higher doses affect, respectively, breast and gonads[14].

Therefore, in accordance with the shown results, it is worth to mention that a single dosimeter, under a protection apron for the whole body, is not sufficient to measure the doses of radiation received by some parts of the body, such as eyes, head, hands, neck, and thyroid. It would be ideal to use at least two dosimeters, one over the apron and another one under it, to get more accurate measures of the doses among employees that are strongly irradiated[14]. However, this last aspect is frequently implanted in the reality of different health institutions, and, in this study, more than 90% interviewees who had frequent contact with radiation were not using this equipment.

First, it is important to raise awareness in the team about the importance of using the dosimeter to control the received rates of radiation. Considering there is no dose of radiation that is considered safe, even if the worker is exposed to a low dose for a long period, there will be risks to health[12].

Even though the members of the nursing teams, circulating in the room, are further from the operating field, it does not reduce the cumulative effect of the exposure to radiation throughout the years. On the other hand, the surgical technicians, also members of the nursing team, are close to the operating field and often receive the same doses of radiation as those received by the surgeons. Usually, because they are not employees in the hospital institutions, they do not get the benefits they would be entitled to due to insalubrity of the exposure.

The risks associated with the exposure of pregnant women to radiation, which, according to gestational age, can cause abortion and even some types of malformations[15]. Considering that most nurses are women, at productive age, as shown by this investigation, this aspect must be evaluated by the people in charge of the nursing staff.

Finally, the benefits resulting from the use of diagnostic and therapeutic methods, by using the ionizing radiation, are unquestionable; however, it is important to observe the ethical features related to the use of excessive doses of radiation for health professionals and patients. Therefore, the discussion of the theme involving health workers, regulatory agents, institutions, or societies addressed to studying this theme is essential to ensure the involvement of all subjects who manipulate or request the use of these devices. It is necessary to provide health professionals with a minimum training, which can generate more knowledge regarding safe manipulation measures[16].

The SC environment is filled with occupational risks for the multiprofessional health team, especially nursing, due to its constant presence. Such risks range from temperature of the environment, quality of the air in the OR[17], and also the one that is most frequently described in literature: the occupational biological risk, which, despite being the most clear one, to which the nursing staff is exposed, is still under-notified, which suggests the need for raising awareness and preparing the professionals as to the importance of notification in these events[18].

Therefore, it is observed that the nursing team must be better oriented regarding all occupational risks related to the SC activities, showing the importance of using protection equipment, of undergoing regular exams, among others, aiming at maintaining the health and the quality of life at work.

CONCLUSIONS

By analyzing the exposure of the nursing team to radiation in SC, in different hospitals from six cities in the countryside of the state of São Paulo, it was observed that the 30 interviewed participants were women; most of the sample comprised nursing technicians, aged between 31 and 35 years, who had been working from 1 to 5 years in SC units.

Among the assessed subjects, 28 reported having contact with radiation; however, 11 employees used some sort of protection. The frequency of contact ranges, depending on the number of surgeries that are conducted every week, but most are exposed between one and three times a week to ionizing radiation sources. Only 11% employees reported earning more due to the

level of dangerousness associated with the exposure to radiation, and only 7% used the dosimeter.

The data shown suggest the need to train all professionals working in SC units regarding the safe and conscious use of radiation, thus minimizing future health-associated problems, as well as more control coming from health services as to the use of safety devices, being in charge of providing safe work conditions to the staff.

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EXPERIENCE OF MORBID OBESE INDIVIDUAL SUBMITTED TO BARIATRIC SURGERY

Vivência do obeso mórbido submetido à cirurgia bariátrica

Experiencia de obesidad mórbida que la cirugía bariátrica

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ABSTRACT: Objective: To understand the experience of the morbidly obese patients undergoing bariatric surgery. **Method:** We opted for the existential phenomenology as a reference of Martin Heidegger. Ten people who were registered in the bariatric surgery service of a teaching hospital in Maceió, Alagoas, were interviewed from March to November 2011. **Results:** From the discourses, four categories were formed that constitute the elements of the experience: requiring surgery, preparing for surgery, experiencing the prospect of surgery, and awakening to a new life. **Conclusion:** We conclude that the experience is permeated by a difficult process. Hence, it becomes imperative that a comprehensive assistance is given to the individuals throughout the process of bariatric surgery so they can overcome possible complications until the conquest of a new life.

KEYWORDS: Nursing. Morbid obesity. Bariatric surgery.

RESUMO: Objetivo: Este estudo teve como objetivo compreender a vivência do obeso mórbido submetido à cirurgia bariátrica. **Método:** Optou-se pela fenomenologia existencial como referencial de Martin Heidegger. Foram entrevistados dez sujeitos, de março a novembro de 2011, inscritos no serviço de cirurgia bariátrica de um hospital de ensino em Maceió, Alagoas. **Resultados:** Dos discursos, emergiram quatro categorias que constituíram os elementos da vivência: Necessitando da cirurgia; Preparando-se para a cirurgia; Vivenciando a perspectiva da cirurgia; Despertando para uma nova vida. **Conclusão:** Conclui-se, portanto, que a vivência é permeada por um processo difícil. Torna-se, então, fundamental uma assistência integral durante todo o processo da cirurgia bariátrica para a superação das possíveis complicações até a conquista de uma nova vida.

PALAVRAS-CHAVE: Enfermagem. Obesidade mórbida. Cirurgia bariátrica.

RESUMEN: Objetivo: Este estudio tuvo como objetivo comprender la experiencia de los obesos mórbidos. **Método:** Optamos por la fenomenología existencial como una referencia a Martin Heidegger. Diez personas fueron entrevistadas entre marzo y noviembre de 2011, ingresó en el servicio de cirugía bariátrica de un hospital universitario en Maceió, Alagoas. **Resultados:** De los discursos, las categorías se constituyeron elementos de la experiencia: Exigir la cirugía; Preparación para la cirugía; Experimentar la perspectiva de la cirugía; El despertar a una nueva vida. **Conclusión:** Se concluye, por tanto, que la experiencia está permeado por un proceso difícil, por lo tanto, se vuelve imperativo que una asistencia integral en todo el proceso de la cirugía bariátrica para superar las posibles complicaciones hasta la conquista de una nueva vida.

PALABRAS CLAVE: Enfermería. Obesidad Mórbida. Cirugía Bariátrica.

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INTRODUCTION

Currently, half a million people (equivalent to 12% of world population) are considered obese — according to the World Health Statistics 2012 report, prepared by the World Health Organization[1]. In Brazil, obesity affects much of the population as a result of poor eating habits and sedentary lifestyle. Consequently, in the last 6 years, the proportion of obese increased from 11.4% in 2006 to 15.8% in 2011[2].

On the basis of the nutritional standards of the Brazilian population in the past few years, obesity has become a public health problem. To facilitate the treatment of patients with morbid obesity, bariatric surgery was regulated under the Unified Health System (SUS) by Ordinance No. 628/GM of April 26, 2001[3].

Bariatric surgery is considered the most effective treatment for obesity class II and III by altering the anatomy and physiology of the digestive tract. However, side effects may occur in the postoperative period as a result of nutritional deficiencies, reduced gastric capacity, and alterations in nutrient absorption along the gastrointestinal tract. Despite the changes, the main objectives of bariatric surgery are to offer low risk, reduce excess weight superior than 50% in the long term in at least 75% morbidly obese patients, improve quality of life with few side effects, lower reoperation rate for less than 2 years, and being reversible and reproducible[4].

Monitoring the morbidly obese patients submitted to bariatric surgery process is responsibility of the multiprofessional health-care team of highly complex care unit, following the guidelines established by Ordinance No. 492 of August 31, 2007[5].

The morbidly obese patients require meticulous preparation in the perioperative, from the decision-making to undergo surgical treatment to the follow-up assessment in the clinical setting or domicile after surgery, as this treatment is characterized by great physical and psychological changes, which often generate feelings of uncertainty and frailty[6].

This preparation should also be offered by primary care professionals, which have an important role in the process. It is essential to maintain the link with the professionals of specialized care to improve the provision of care for morbidly obese patients submitted to bariatric surgery. During the preoperative period, teams must offer support to the individual and their families, especially regarding food discipline, counseling, and support for preparation for surgery. This care should be maintained in the postoperative phase for the full and gradual recovery of digestive function[7].

The role of nursing is essential while taking care of education, assistance, and management functions. Therefore, studies have been conducted with the intention of improving the quality of care, which requires a differentiated nursing care. In regard to the perioperative period, the need to supply difficulties related to physical space, materials, and equipment is identified as relevant[8], as well as specific nursing care for morbidly obese patients that goes beyond the techniques and procedures for the operation, involving particularities[9]. Authors stated that still greater commitment is necessary to carry out studies related to morbidly obese patients submitted to bariatric surgery[8-11].

This study aimed to provide a better understanding of the process of bariatric surgery, from the own experience of the morbidly obese patients. The relevance focuses on the fact that it enables reflections on the unveiled phenomenon, awakening another look in care practice when treating a morbidly obese patient.

METHOD

For this study, we chose the qualitative research based on phenomenology. To investigate and understand the morbidly obese, without prejudice or theories, but as a concrete experience and conscious subject, we used an approach to the philosophical framework of Martin Heidegger, whose central issue was the search of the meaning of being, to support the analysis[12]. For a better understanding and to show what is hidden in their experience, it is necessary that the researchers' attention turns to the description of the morbidly obese experience exactly as it is.

The study was conducted from March to November 2011 in the morbidly obese care clinic accredited as high complexity care unit of a teaching hospital in the city of Maceió, Alagoas.

According to the ethical and legal principles in force under Resolution no 466/12, the study was authorized by the institution's educational superintendence and approved by the Research Ethics Committee of Universidade Federal de Alagoas, under the Protocol no 004590/2011-51.

Ten subjects who had previously been submitted to the preoperative, perioperative, and postoperative of a bariatric surgery at this institution participated in this study. They were interviewed in the late postoperative period, during which they participated in the multiprofessional outpatient treatment at the bariatric surgery service of the hospital. The number of participants was determined during the analysis of the reports, from the moment that the researchers' concerns were answered and the purpose of the study achieved.

The interviews were scheduled and held in a quiet place. The subjects were informed about the purpose of the study, anonymity, and the possibility of refusal, as well as the intention of publishing the study results in the academic area. They also had the right to withdraw from the research at any moment. After the explanation, we requested the signature of the Term of Consent (IC). All were coded under the letter S, followed by the numbers in ascending order, before beginning the transcripts.

The interviews were recorded and transcribed, guided by the following question: how was it for you to experience the bariatric surgery, from the beginning to the present day?

To capture the fullness expressed by the subjects in their statements, we used procedures recommended by the phenomenological method and humanities. First, we did an attentive reading of each of the speeches, based on the feelings shown by the students themselves and the factual elements of the world they were inserted in. Once grasped the meaning of each description, we turned to the individual statements, now seeking the meaning units, focusing on the experiences of the morbidly obese patients. Then the most relevant meaning units were phenomenologically selected to make a prior categorization. In the last step, the meaning units were grouped and related, building the themes analyzed in this study, which unveiled the experiences of the morbidly obese patients submitted to bariatric surgery[13].

To characterize the study subjects, we collected information that allowed us to identify that 90% were women and had a mean age of 45 years; therefore, most were women classified as young adults. Regarding marital status, 20% were single, 20% were widowed, and 60% were married. Importantly, 70% had a family income of approximately two minimum wages, 20% of one minimum wage, and 10% of five minimum wages, which exposes their low economic status. Regarding education of the subjects, 10% had incomplete primary education, 20% complete primary education, 20% incomplete secondary school, 40% complete secondary school, and 10% complete higher education.

RESULTS

Requiring surgery

It was discovered that the beginning of the trajectory was characterized by several attempts aiming weight loss, highlighting the nutritional education and medical methods. Hence, the implementation of persistent individual efforts in the pursuit of overcoming obesity is noticeable. In this context, the patients experience frustration in achieving the desired goal because they needed a significant weight loss, which was unattainable:

> I went through a long process of diets. I tried to lose weight, but I couldn't (S1).

> I had already made several attempts, gone on diets, lost weight, taken medicines and when I stopped [...] (S2).

It is evident that even experiencing a dietary and pharmacological treatment, the difficulty of weight loss maintenance generated fatigue and discouragement, gradually leading to the abandonment of such methods.

We noted that the constant recurrence of weight gain and the acceptance of defeat preceded and contributed to the decision-making of bariatric surgery:

> [...] I could lose weight, but within a year I would gain it all over again, this was one of the reasons why I decided to have the surgery (S3).

The morbidly obese patients reveal having awareness of the possibility of the comorbidities associated with obesity. Restricting common activities of daily life such as walking was also an important factor for making the decision to undergo bariatric surgery:

> My goal was to have surgery, I could not stand it anymore. I couldn't even walk, I couldn't do almost anything (S6).

> I needed to do it, I had bone problems because I was overweight, it was the only disease I had and it was getting worse, that's what brought me here (S9).

We observed that the need presented by the study subjects was weight loss to reduce comorbidities and provide greater autonomy in activities of daily life.

Bariatric surgery started to be seen as a tool to enable them. Therefore, the claims for bariatric surgery led to the assertion that the demand is given as the last option for the treatment of obesity, and is recognized as essential to be healthy:

> [...] then I started to see that it was necessary to operate, I needed this surgery and I was not there by chance or vanity, I needed it (S4).

In this way, individual factors leading to the decision of bariatric surgery as a resource for weight loss were presented. The quest for an improved health status contributed significantly to the recognition of the needs of surgical treatment. In this quest, patients go through rich life experiences until they are able, as it is described in the next category.

Preparing for surgery

In discourse analysis, it was possible to identify that the bariatric surgery service is characterized by a multiprofessional follow-up, providing a trust and well-developed relationship, as well as an elaborate bond with the morbidly obese patients, which contributes significantly with the preoperative preparation as well as facilitates the postoperative:

> [...] as part of the program, I started receiving nutritionists, psychologists, anesthesiologists, cardiologists, endocrinologists. I believe that I became 80% prepared and it was much easier (S5).

> [...] Here we have a good follow-up that helps you accept the postoperative (S3).

In the support group meetings with professionals, they experienced moments of listening, encouragement, exchange of experiences, discoveries, acceptance of obesity, and formed bonds that provided a sense of mutual trust, which contributed positively in subsequent moments of the treatment.

> [...] when we enter the group, we are already consider it a family. We can count on the professionals, on the colleagues. We listen to the problems of each other, there is a relief, we feel very well (S2).

> [...] it helps us very much to see ourselves as obese. With the professionals monitoring, I managed to set foot on the ground (S3).

In this occasion, health education actions are provided and facilitate the orientation of the surgical process experienced, so patients can understand the meaning of each phase they went through. Thus, the acceptance and understanding of the risks, benefits, and even symptoms associated with surgery were facilitated by these interventions:

> [...] we have a meeting where you see the surgery procedure. When we enter the room, we already know what will happen in the postoperative (S4).

> You are aware of what you'll do, of the risks that you will take, of the positive and negative parts [...] (S1).

It is unveiled that the assistance provided along with the existing interaction during the support group meetings helps on the absence of complications during the postoperative period, which results in a successful quality of service:

> I was called to do the surgical procedure and it was 100%, from the recovery room straight to the apartment, where I was discharged (S5).

During the preoperative preparation of bariatric surgery, the study subjects felt an empathetic relationship that led to an exchange of experiences and expectations with each other.

Thus, it was possible to unveil that the interaction established between the study subjects and professionals of health services was a unique opportunity that allowed the practice of individualized care. Bringing people together helped to implement a more humanized assistance.

As a result of the multiprofessional follow-up, we observed the realization of group meetings and the dedication of the morbidly obese patients, essential characteristics for a good preoperative preparation.

The unveiling of this category enabled the understanding of triggered events that were associated with each other, as the importance of multiprofessional monitoring of quality, along with the collaboration of the study subjects, which contributed to the preoperative preparation and thus provided a quiet postoperative period. This presented a positive experience with no complications during the surgical process, which facilitated the perception of the quality of care.

However, even experiencing the surgical preparation with these characteristics, the subjects present a clear anxiety phase, as it is shown in the next category.

Living the perspective of surgery

Through the discourse analysis, first it was possible to unveil that the bariatric surgery has reached the desired objective. Therefore, patients experienced the preoperative stage with great perspective, as shown in the testimonies:

> I've waited for those five years with high expectations, and that's what I wanted (S6).

The expectation mentioned earlier raises a sense of anxiety, which can affect the weight loss required during the preoperative period. We noticed that this anxiety was heightened by concerns about the achievement of the desired objective and fear that any individual factor could negatively impact the surgical success.

> The only thing I couldn't do was to lose weight before the surgery, because I was anxious, I didn't know if I should go in wearing sandals, flip flops or high heels (S7).

The testimonies showed, through the exchange of experiences in the support groups, that patients have become connoisseurs of possible setbacks during the perioperative stage, and it was clear in their statements that this knowledge also contributed to the emergence of anxiety.

> My anxiety was like, "hopefully it won't lack anything"! Because there has been lack of anesthesiologists, lack of clips, lack of rooms, lack of surgeons… (S4).

Anxiety also occurred when the economic aspect in the postoperative period was mentioned, as financial needs were focused and openly discussed in meetings, predisposing to a concern of how this financial process would be during recovery.

> [...] I was concerned about finances in the postoperative, because this is a factor that is widely discussed here (S3).

We noticed that anxiety was present during the preoperative period, for bariatric surgery became an objective pursued by the subjects to improve the level of health and quality of life. Thus, the subjects were concerned with aspects related to the perioperative periods, such as lack of material and human resources, and the economic aspects of the postoperative period.

Overcoming this phase did not mean the end of treatment, but the beginning of a new experience.

Awakening to a new life

There were several changes in the postoperative period. In regard to diet, patients reported that the current reality is completely different from what they lived in the past:

> I would take a glass of juice and pass out, it was like having a plate of feijoada. (S7).

> You go from a plate full of food to 50 ml of something (S10).

The behavioral change related to food generated consequences, which may be seen as beneficial to health or unpleasant and embarrassing:

> There are many health benefits (S5).

> My appearance changed since I lost weight, I look older (S8).

The patients recognized the changes that bariatric surgery brought to their lives and were aware of the need to adapt to the new self-care habits. In this context, given the new circumstances, they felt prepared to face the adaptation to the new reality:

> There's the phase where you have to learn about your limits and know that you can not do what you used to do. You have to limit yourself to a slice of pizza, not three (S1).

Finally, they showed with much excitement that the meaning of bariatric surgery goes well beyond a surgical procedure. It sets up the possibility of a new life, full of important implications for self-esteem, self-fulfillment, independence, freedom, joy, and happiness:

> For me it was a benefit because we have self-esteem, we feel better because of the weight loss. Now we start to take better care of ourselves (S1).

> [...] since the day I woke up in the infirmary until today it's been a rebirth, a new life of joy and happiness (S8).

With the unveiling of the phenomenon, we noticed that, in fact, bariatric surgery does not mean the end of treatment, but the beginning of a new life, with modifications in routine including new habits such as physical activity and behavioral and dietary changes, which require adaptation to self-care.

Considering that obesity may have a negative impact on the life of the individual, the assertions related to the postoperative period of bariatric surgery lead to the fact that this is a revival phase, permeated by self-esteem and autonomy that will enable the achievement of quality of life.

DISCUSSION

According to the study results, the ineffectiveness of the conservative treatment of obesity is clear because these methods include diet, exercise, behavioral therapies, and medications that help people with mild-to-moderate obesity. Regarding morbid obesity, the results of clinical treatment showed success rates of less than 10%, with 95% of the obese patients recovering their initial body weight in up to 2 years[14].

In addition, excess weight contributes to the development of comorbidities and hinders body mobility, interfering in the simplest daily activities and leaving the obese patients with a degree of dependence. This involves directly the individual's autonomy, an essential condition for a good quality of life[15].

These factors have a direct influence in the decision-making of the surgery, making the need to submit oneself or not stressful and complex for the morbidly obese and their family, both for possible hazards as for feelings experienced during surgery.

Thus, it is essential that the nursing professional is able to develop care to minimize the fears and anxieties felt in the pre- and postoperative periods. He/she can help positively in stressful situations and reduce the level of anxiety during the surgical process, as he/she is the professional that needs more time with the morbidly obese patients and their family[16]. For this purpose, it is necessary that the professional know the patient, both as regard to the conditions for health maintenance as the aspects relating to their physical and psychological conditions[15].

This assistance is of fundamental importance because the surgical patient, in the preoperative period, manifest anxiety regarding the entire surgical process. This anxiety is not a pathological symptom, but a state that allows for privileged access to self-awareness, revealing the search for a new meaning of life; it is an existential problem, not only a biological or behavioral one, which will address the relationship between health and disease through a new look[12].

During the preoperative period of bariatric surgery, when patients experience a relationship of empathy, they stripped out of their "I" to, along with the other, become "we", because they become present and coparticipate in their experiences. The involvement with the other allowed them to share their experiences. Thus, the morbidly obese turned into a "Being-with-the-other"[12].

The interaction established between the study subjects and professionals of health services was perceived as a unique opportunity for the implementation of care practices, aiming the employment of a more humanized care.

The operation of group activities provides an environment of mutual learning and growth for the participants[17].

The multiprofessional monitoring involving the morbidly obese individuals forms an essential tripod for a good preoperative preparation. These perceptions corroborate the literature, which states that better results of bariatric surgery are achieved when these individuals receive care from a multidisciplinary team. They provide adequate preoperative preparation, essential to the success of all stages that compounds the surgical process. In addition, the information provided and shared in the preoperative period has shown benefits and positive influences in the individual's response in the postoperative period[18].

The guidance and monitoring of the morbidly obese patients who will experience the surgical process must have preparation for the situations that will be experienced. In this scenario, the nursing professionals play key role in a multidisciplinary team, as they can provide guidance on the necessary adaptations to the new condition of life, looking at each person in a particular way[19].

Caring is considered the essence of nursing. Thus, it is emphasized that in Heidegger's conception there are two ways to take care: the jump on the other, dominating him/her, manipulating him/her, doing everything for him/her; and jump in front of the other, allowing him/her to assume his/her actions and choices[12]. In this process, the nursing professional enables the morbidly obese patient to discover him/herself as a being-with-the-other who is responsible and able to take care of him/herself.

Obesity and overweight can have a negative impact on the quality of life of individuals due to losses in the physical and psychosocial functioning[19]. Assertions on the postoperative period of bariatric surgery lead to the claim that this is a phase of revival, happiness, self-esteem, and autonomy, which provided the achievement of quality of life. After weight loss, there is a sense of enchantment and need for social inclusion, a rebirth invades the existence[16].

FINAL CONSIDERATIONS

Unveiling the phenomenon experienced by the morbidly obese individual who is submitted to bariatric surgery allowed us to realize that, throughout the process, from preoperative preparation to recovery, individual care assumes full relevance.

The experience of the morbidly obese patient is permeated by difficult times, which are gradually overcome in the pursuit of the ideal weight that will provide personal fulfillment and a better quality of life, enabling the integration in social life that was once denied.

So while difficult adjustments and overcoming possible complications in the postoperative period are necessary, the promotion of self-esteem and autonomy shows that the experience of the morbidly obese individual who is submitted to bariatric surgery is considered essentially positive.

We emphasize the satisfaction on learning the unveiled phenomenon in their experience, providing subsidies to make a reflective process in the practice of differentiated nursing care, contemplating the entire context of the obese patient, as well as the motivation for further studies. However, it is worth noting that this analysis in different contexts will not necessarily converge to similar results, although it may enrich its understanding.

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REPROCESSING OF MEDICAL DEVICES: SANITARY QUALITY ANALYSIS IN PUBLIC HOSPITALS

Reprocessamento de produtos para saúde: análise da qualidade sanitária em hospitais públicos

Reprocesamiento de productos para la salud: análisis de la cualidad sanitaria in hospitales públicos

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ABSTRACT: Objective: To analyze the technical conditions for reprocessing of medical products, in the light of service quality and sanitary safety among the users of reprocessed items. **Methods:** The study presents an evaluation based on multiple case studies collected in the reprocessing facilities of ten public hospitals in the State of Bahia, Brazil. The analysis is referred to five independent variables that influence conditions for reprocessing of medical products. Each of these five variables was considered in three rating levels of quality. **Results:** Considerable inadequacies were observed for all variables, so that none of the ten observed cases showed adequate technical conditions for reprocessing medical products. **Conclusions:** We conclude, therefore, that the hospitals considered in this study adopt inadequate practices for reprocessing, which is a problem for hospital care and the regulatory agencies.
KEYWORDS: Surgical equipment. Health surveillance of products. Quality control. Patient safety

RESUMO: Objetivo: Analisar as condições técnicas do reprocessamento de produtos médicos, tendo em vista a qualidade e segurança sanitária da população usuária de produtos reprocessados. **Método:** Trata-se de uma pesquisa avaliativa de estudo de casos múltiplos. Participaram os Centros de Material e Esterilização de dez hospitais públicos da Bahia. Foram estudadas cinco variáveis independentes que influenciam as condições do reprocessamento de produtos médicos. Adicionalmente, cada variável foi analisada em três níveis de avaliação de qualidade. **Resultados:** Evidenciou-se uma generalizada inadequação de todas as variáveis estudadas. Dos dez casos pesquisados, nenhum apresentou condições técnicas adequadas de reprocessamento de produtos médicos. **Conclusão:** Conclui-se com esses dados que os hospitais deste estudo possuem práticas de reprocessamento inadequadas, apontando possíveis problemas para o cuidado assistencial e para os órgãos fiscalizadores.
PALAVRAS-CHAVE: Equipamentos cirúrgicos. Vigilância sanitária de produtos. Controle de qualidade. Segurança do paciente

RESUMEN: Objetivo: Analizar las condiciones técnicas para el reprocesamiento de productos médicos, bajo el óptica de la calidad de servicio y de la seguridad sanitaria entre os usuarios de esos artefactos reprocesados. **Métodos:** En la investigación se presenta una evaluación en base a múltiples estudios de caso realizados en las unidades de reprocesamiento de diez hospitales públicos del Estado de Bahia, Brasil. El análisis está referido a cinco variables independientes que afectan las condiciones para el reprocesamiento de productos médicos. Se consideró cada una de las cinco variables en tres niveles de calidad. **Resultados:** Se identificaron inadecuaciones presentes en todos los casos, de manera que ningún de los diez casos observados presentó las condiciones técnicas indicadas para el reprocesamiento de productos médicos. **Conclusión:** En base a esa evidencia, concluimos que los hospitales considerados en el presente estudio adoptan prácticas inadecuadas en el reprocesamiento, lo que presenta un reto para el cuidado hospitalario y para los órganos fiscalizadores.
PALABRAS CLAVE: Equipo quirúrgico. Vigilancia sanitaria de productos. Control de calidad. Seguridad del paciente

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INTRODUCTION

Thousands of different health-related products worldwide are used for detecting, diagnosing, and treating medical conditions. Despite the considerable progress in hospital care services, made possible by the advent of the industry of health-related products*, the use of such items brought, besides the benefits and prolongation of life, serious risks to the patient that needs to use them. This raises theoretical and practical questions of safety and effectiveness of processes, demanding new alternatives for the use and reuse of these materials from health-care services and the state[1-5].

Health-related products are defined by the manufacturer as reusable or single-use items. Reusable or multiple-use items are durable goods and designed to withstand the decontamination procedures. The reprocessing action is necessary for the safe reuse of these materials. This is a process that includes cleaning, performance evaluation test, disinfection, or sterilization to be applied to the medical product, ensuring a safe use, including quality control in all phases[6-8].

The products are reprocessed by the Material and Sterilization Center (MSC), a functional structure of a health-care service that is responsible for cleaning, disinfection, sterilization, quality control, and product dispensing. It is a crucial service, on which all health-care activities depend, and its operation requires professionals with knowledge related to the area of production and quality control, such as physical, chemical, and biological monitoring; process validation; and product traceability[3-5].

These activities, which are usual in industries and still incipient in Brazilian hospital services, require, in addition to competent professionals, committed to the subject of medical products, a whole infrastructure that favors the execution of activities relevant to the reprocessing of products to minimize the risks envolved[3-5].

Among the risks associated with the reprocessing and reuse of health-related products, the literature mentions infection and loss of product functionality as the most relevant, but other events such as presence of endotoxins, biofilms, and bioincompatibility have also been reported[9-11].

Therefore, the importance of the work processes of an MSC is undeniable. Its actions require planning and management of the risk associated with the used products and the various activities that constitute the reprocessing.

Given the importance of the reuse of medical products for public health, we intend to answer, in this article, the central question: how does the reprocessing of medical products work in public hospitals in Bahia? From this question, we outlined the following general objective: to analyze the technical conditions of the reprocessing of medical products in public hospitals of Bahia, regarding the quality and security of the user population of reprocessed products.

METHOD

This is a survey in the area of evaluation of health practices. The methodological strategy is a descriptive and holistic study of multiple cases[12]. A case study is an empirical investigation that analyzes a contemporary phenomenon inside its real-life context, especially when the boundaries between the phenomenon and the context are not clearly defined, with a prominent place within the evaluation research. It includes both single-case (one unit under evaluation) and multiple-case (several units under evaluation) studies. They are classified as holistic if they have only one unit of analysis.

The unit analyzed in this study is the technical condition for reprocessing of medical products in public hospitals located in the countryside of Bahia, recognized by this case methodology. The strategies used in the search for empirical evidence were the structured interview using a specific form for data collection and the direct observation.

The MSCs of 10 public hospitals located in the countryside of Bahia participated in this study. They were selected of the 31 Regional Health Boards (DIRES) existing in the State to be evaluated according to the Decree of the Bahia State Health Department (SESAB) no. 1083 / 2001[13], which regulates the standards for quality of care with a focus on hospital infection control. These hospitals were selected when hospital quality of the hospitals within the countryside was evaluated, located through the data from the State Center for Infection Control (NECIH) of SESAB and constituted the 10 multiple cases of this study. Each hospital has received a code from 1 to 10 (H1 to H10) to maintain their anonymity.

*In this article, we use the term health-related product as a synonym of medical product, equipment, device, item, material to keep the same nomenclature used by the National Health Surveillance Agency (ANVISA).

The selected hospitals were contacted by telephone, when a visit was scheduled for data collection. The data were collected by a technician (nurse) of NECIH, using the assessment tool standardized by the decree mentioned earlier.

The following independent variables that influence the conditions for the reprocessing of medical products were studied:

1. physical structure of the MSC;
2. use of personal protective equipment (PPE) in the MSC;
3. in-service training on the cleaning, disinfection, sterilization, and control processes;
4. applied methods of cleaning, disinfection, and sterilization of products;
5. quality control of the sterilization; and
6. storage of reprocessed products.

Each variable was given a score based on the number of questions assigned to its group, and each question was scored as 1, which meant conformity of the response with the specific ANVISA standard for the functioning of MSCs in the country[14], and as 0, which corresponded to the inadequacy of the response according to the same standard. In addition, each variable was analyzed in three quality assessment levels: 1, 2, and 3.

Level 1, with 55 questions, evaluated the actions of the MSC that were considered structural and indispensable for the processing of products. Level 2, with 14 questions, evaluated actions associated with the organization of operational work processes. And level 3, with 20 questions, evaluated actions considered more elaborate and of excellence in the processes of cleaning, disinfection, and sterilization of health-related products, totaling 79 adequacy points.

Similar to a study carried out by other authors[15], each evaluated MSC was given a score, according to their corresponding degree of technical condition for the reprocessing of medical products, and thus classified into three levels: (0) inadequate condition for reprocessing of products; (1) condition for reprocessing of products requiring adaptation; and (2) adequate condition for reprocessing of products, as shown in Table 1.

RESULTS

We start the description of the results of the empirical data of this study with the characterization of the multiple cases, as shown in Chart 1. The studied cases are found to be located in regions far from the state capital, mostly in the West (4 cases, 40%) and North (2 cases, 20%) regions. Of the 10 MSCs studied, 9 (90%) are in public hospitals, of which 3

Table 1. Classification score of Material and Sterilization Centers of the analyzed hospitals, Salvador, 2013.

Classification regarding the reprocessing of medical products	Final score (%)
Adequate MPR condition	81–100
MPR condition requiring adjustment	41–80
Inadequate MPR Condition	0–40

MPR: medical product reprocessing

Chart 1. Characterization of the analyzed hospitals, Salvador, 2013.

Case/ hospital	Regional Health Board	Administrative authority	Region	Number of beds
H1	25th	Public, state level, with management by a private health organization	West	225
H2	15th	Public, state level	North	150
H3	22th	Public, state level	West	50
H4	30th	Public, state level	Southwest	106
H5	25th	Public, state level, with management by a private health organization	West	24
H6	15th	Public, city level	North	70
H7	7th	Public, state level, with management by a private health organization	South	208
H8	6th	Private	South	8
H9	8th	Public, state level	Extreme South	125
H10	25th	Public, city level	West	42

are managed by an outsourced organization. Regarding the number of beds, five hospitals (50%) are considered medium-sized and five (50%) small-sized.

Charts 2 to 4 present the data of the MSCs regarding quality level (1, 2, and 3), and the studied variables of product reprocessing.

Chart 2 shows the data from the variables of reprocessing of medical products for the cases studied, correlated with the level 1 of quality. At this level, which assesses the actions of MSCs considered basic and indispensable for the processing of the products, the studied variables had scores between 3.6% (H10) and 51% (H1 and H9). The physical structure presented adequacies ranging from 2.1% (H10) to 51% (H1 and H9). The use of PPE ranged from 100% adequacy in six MSCs studied (H2, H4, H5, H6, H7, and H9), 50% adequacy in two MSCs (H1 and H3), and no PPE use in two MSCs (H10

Chart 2. Characterization of Material and Sterilization Centers of the analyzed hospitals according to the level 1* of quality and variables of reprocessing of medical products, Salvador, 2013.

Cases	Physical structure (n = 47)	PPE use (n = 2)	Training (n = 2)	MP processing (n = 3)	Quality control of sterilization (n = 1)	MP storage (n = 0)	Total score (n = 55)
H1	24 (51%)	1 (50%)	0	2 (66.7%)	1 (100%)	0	28 (51%)
H2	20 (42.5%)	2 (100%)	0	2 (66.7%)	1 (100%)	0	25 (45.4%)
H3	11 (23.4%)	1 (50%)	0	1 (33.3%)	1 (100%)	0	14 (25.4%)
H4	13 (27.6%)	2 (100%)	0	2 (66.7%)	1 (100%)	0	18 (32.7%)
H5	14 (29.7%)	2 (100%)	2 (100%)	2 (66.7%)	0	0	20 (36.5%)
H6	11 (23.4%)	2 (100%)	0	2 (66.7%)	0	0	15 (27.2%)
H7	11 (23.4%)	2 (100%)	0	1 (33.3%)	0	0	14 (25.4%)
H8	12 (25.5)	0	0	1 (33.3%)	0	0	13 (23.6%)
H9	24 (51%)	2 (100%)	0	2 (66.7%)	0	0	28 (51%)
H10	1 (2.1%)	0	0	1 (33.3%)	0	0	2 (3.6%)

*Level 1 assesses the actions of the Material and Sterilization Center considered structural and indispensable for the processing of the products; PPE: personal protective equipment; MP: medical product.

Chart 3. Characterization of Material and Sterilization Centers of the analyzed hospitals according to the level 2* of quality and variables of the reprocessing of medical products, Salvador, 2013.

Cases	Physical structure (n = 1)	PPE use (n = 0)	Training (n = 0)	MP processing (n = 5)	Quality control of sterilization (n = 7)	MP storage (n = 1)	Total score (n = 14)
H1	0	0	0	4 (80%)	5 (71%)	1 (100%)	10 (71.4%)
H2	0	0	0	4 (80%)	4 (55%)	1 (100%)	9 (64.2%)
H3	0	0	0	0	1 (14.2%)	1 (100%)	2 (14.2%)
H4	0	0	0	2 (40%)	1 (14.2%)	1 (100%)	4 (28.5%)
H5	0	0	0	2 (40%)	3 (42.8%)	1 (100%)	6 (42.8%)
H6	0	0	0	0	2 (28.5%)	1 (100%)	3 (21.4%)
H7	0	0	0	1 (20%)	0	0	1 (7.1%)
H8	0	0	0	0	0	1 (100%)	1 (7.1%)
H9	0	0	0	3 (60%)	3 (42.8%)	0	6 (42.8%)
H10	0	0	0	1 (20%)	1 (14.2%)	1 (100%)	3 (21.4%)

*Level 2 assesses actions related to the organization of operational work processes in the Material and Sterilization Centers; PPE: personal protective equipment; MP: medical product.

and H8). The MSC professionals were trained in methods of cleaning, disinfection, and sterilization of products in only one MSC (H5). The adequacy of cleaning, disinfection, and sterilization processes had scores of 33.3% in four MSCs (H3, H7, H8, and H10) and 66.7% in six MSCs (H1, H2, H4, H5, H6, and H9). In four MSCs, there was 100% adequacy to the sterilization quality controls (H1 to H4) and no control in six MSCs (H5 to H10). No MSC had adequacy to the standards of storage of sterilized products.

At level 2, which evaluates the actions of MSCs associated with the organization of operational work processes, the studied variables had scores between 7.1% (H8 and H7) and 71.4% (H1). The standardization of the product processing had 80% adequacy in just two MSCs (H1 and H2), 60% in one MSC (H9), 40% adequacy in two MSCs (H4 and H5), and no standardization in three MSCs (H3, H6, and H8).

Similar to the low percentages of adequacy presented by the MSCs at level 1, this pattern is observed to be maintained at level 2 also. Of the 10 analyzed MSCs, only 2 (20%, H1 and H2) have total percentage of adequacy at level 2 above 50%, with 8 MSCs (80%) showing percentages ranging from 7.1 to 42.8%, showing difficulties in establishing work processes inherent to the activities of processing products.

At level 3, in which the actions regarding the processing of products are considered more elaborate and of excellence, four MSCs (H2, H7, H8, and H10) had no score, one MSC had 10% adequacy (H6), two MSCs had 20% adequacy (H4 and H5), one MSC had 40% adequacy (H3), and two MSCs had 60% and 70% adequacy (H9 and H1, respectively). The variables of quality control for product sterilization are absent in six MSCs (H2, H4, H5, H7, H8, and H10), one MSC had 14.2% adequacy (H6), and another had 42.8% adequacy (H3). Only two MSCs had adequate control of the sterilization process over 50% (H1 and H9).

We present next the classification of the analyzed cases according to the degree of the technical condition for the

Table 2. Classification of Material and Sterilization Centers of the analyzed hospitals according to the degree of the technical condition for reprocessing of medical products, Salvador, 2013.

Cases	Adequate technical conditions n (81–100%)	Technical conditions requiring adjustments n (41–80%)	Inadequate technical conditions n (0–40%)
H 1		45 (56.9%)	
H 2			34 (43.0%)
H 3			20 (25.3%)
H 4			24 (30.6%)
H 5			28 (35.4%)
H 6			19 (24.0%)
H 7			15 (18.9%)
H 8			14 (17.7%)
H 9			40 (50.6%)
H 10			5 (6.3%)

Chart 4. Characterization of Material and Sterilization Centers of the analyzed hospitals according to the level 3* of quality and variables of the reprocessing of medical products, Salvador, 2013.

Cases	Physical structure (n = 3)	PPE use (n = 0)	Training (n = 0)	MP processing (n = 0)	Quality control of sterilization (n = 7)	MP storage (n = 0)	Total score (n = 10)
H1	2 (66.6%)	0	0	0	5 (71%)	0	7 (70%)
H2	0	0	0	0	0	0	0
H3	1 (33.3%)	0	0	0	3 (42.8%)	0	4 (40%)
H4	2 (66.6%)	0	0	0	0	0	2 (20%)
H5	2 (66.6%)	0	0	0	0	0	2 (20%)
H6	0	0	0	0	1 (14.2%)	0	1 (10%)
H7	0	0	0	0	0	0	0
H8	0	0	0	0	0	0	0
H9	1 (33.3%)	0	0	0	5 (71%)	0	6 (60%)
H10	0	0	0	0	0	0	0

*Level 3 assesses actions considered more elaborate and of excellence in cleaning, disinfection, and sterilization processes of health-related products; PPE: personal protective equipment; MP: medical product.

reprocessing of medical products. In Table 2, of the 10 MSCs studied, none had adequate technical conditions according to the studied variables. Just one MSC (H1) presented technical conditions requiring adequacy, and nine MSCs presented inadequate scores regarding processes of reuse of medical products. The lowest percentage of adequacy (6.3%) was observed in H10, and the highest percentage (56.9%) in H1, both of the Western region of Bahia. The first is a city hospital and small-sized (42 beds), and the latter is a state hospital, with outsourced management and large-sized (225 beds).

DISCUSSION

The data about the reprocessing of medical products of the evaluated MSCs showed inadequacies of the independent variables in correlation with the three quality levels that were studied.

The analysis showed a general inadequacy in all the studied variables such as the infrastructure of material resources; the use of PPE; training of professionals; cleaning, disinfection, and sterilization processes; sterilization quality control; and conditions for storage of the products in the MSCs of the evaluated hospitals, which certainly contributed to the fact that no MSC in this study presented technical conditions for reprocessing that could be considered appropriate.

The analyzed variables are directly related to the effectiveness of the processing of products, and the inadequacies presented here indicate key issues for the safety of the reuse of products, evidenced in the absence of protocols for cleaning, disinfection, and sterilization, as well as absence of quality control of the sterilization.

Moreover, no MSC had adequacy of the variable of storage of sterilized products. This can lead to events that may contaminate the products after sterilization and compromise the maintenance of the sterility of the stored products, constituting another problem related to the processing of products in these institutions.

These results show serious issues concerning the reuse of medical products in these hospitals, compromising one of the dimensions of the quality of health care, which is the safety of the patient, and, in this case, also the safety of the professionals involved in these processes because they execute their activities under exposure to chemical and biological hazards, making the reuse and reprocessing of medical products in these 10 studied hospitals a major risk factor for patients using these products and professional handlers.

Other researches on the subject of product reuse have similar results to those presented here, such as, a multiple-case study that aimed to analyze the technical conditions for the reprocessing of medical products in four hospitals in a large Brazilian capital. Two were public hospitals in the state network and two belonged to the ANVISA sentinel network, in which the authors used as the gold standard for processing of products a regulatory model in the light of the recommendations of the literature. The data from this study showed inadequacies in cleaning, drying, disinfection, sterilization, and traceability of the products, concluding that no hospital organization studied, even those linked to the ANVISA network, presented adequate technical conditions for the reprocessing of products[5].

A research that aimed to evaluate structure, process, and outcome of an MSC of a large hospital in Paraná, in which the studied indicators were divided into three groups (cleaning; preparation, packaging and sterilization; storage and distribution), obtained noncompliance for the variables cleaning (32.4%); preparation and packaging (26.9%); and sterilization, storage, and distribution (26.2%). The overall rate of compliance with the adopted evaluation instrument was 61.9%, and the authors concluded that this MSC needs improvements to upgrade the carried out processes[15].

A study that analyzed the conditions of storage of sterilized medical products in large hospitals also found irregularities in the storage conditions after sterilization, such as inadequate storage sites regarding both the physical structure and the ventilation conditions, besides the excessive handling of sterilized products, concluding that the recommendations of ANVISA for the storage of sterilized products are not being fully implemented in all the analyzed institutions. It also corroborates the findings of our study[16].

CONCLUSION

The results of this study confirmed the regional problems involving the reprocessing of medical products, as evidenced by the low quality of the data from the researched variables, and indicated gaps in the functional conditions of these services, enhancing the risks for the patients and health professionals.

From these data, we concluded that the hospitals of this study have inadequate reprocessing practices, pointing out possible problems to the area of health-care service and the regulatory agencies.

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FACTORS RELATED TO EXCHANGE OF DISINFECTION SOLUTIONS OF ENDOSCOPIC DEVICES

Fatores relacionados à troca das soluções de desinfecção dos aparelhos endoscópicos

Factores relacionados con el intercambio de soluciones de desinfección de endoscópios dispositivos

Adriana Cristina de Oliveira[1], Maria Letícia de Miranda Mati[2]

ABSTRACT: Objective: To identify the factors related to the replacement of disinfection solutions of endoscopes devices. **Method:** A quantitative study carried out at an endoscopy service in the city of Belo Horizonte, belonging to the Brazilian National Health System, in the period from March 28, 2012 to March 20, 2013. It was carried out a documentary analysis of test records for daily monitoring of chemical disinfection processes in that particular sector. Descriptive statistics were used with frequency distribution and central trend measurements. **Results:** The following factors related to the replacement of the disinfecting solution of peracetic acid were identified: minimum solution concentration inferior to the required (75%), volume below the ideal amount (15%), presence of deposits and accidental solution spillage, both at 5%. The extra cost estimated on the unnecessary exchanges reached 66.6%. **Conclusion:** There is a prior need to review the planning and protocols of the service.

KEYWORDS: Endoscopy, gastrointestinal. Disinfection. Peracetic acid. Sanitizing products.

RESUMO: Objetivo: Identificar os fatores relacionados à substituição das soluções de desinfecção dos aparelhos endoscópicos. **Método:** Estudo quantitativo, realizado em um serviço de endoscopia digestiva alta de Belo Horizonte pertencente ao Sistema Único de Saúde, entre 28 de março de 2012 e 20 de março de 2013. Fez-se uma análise documental dos registros de testes realizados para monitorização diária dos processos de desinfecção química no setor citado. Foi utilizada estatística descritiva com distribuição de frequência e medidas de tendência central. **Resultados:** Como fatores relacionados à substituição da solução de desinfecção de ácido peracético, identificou-se a concentração mínima da solução inferior à necessária (75%), volume abaixo da quantidade ideal (15%), presença de depósitos e derramamento acidental da solução, ambos com 5%. O custo extra estimado com as trocas desnecessárias foi de 66,6%. **Conclusão:** Observou-se a necessidade de revisão do planejamento e protocolos do serviço de forma prioritária.

PALAVRAS-CHAVE: Endoscopia gastrointestinal. Desinfecção. Ácido peracético. Saneantes.

RESUMEN: Objetivo: Identificar los factores relacionados con la sustitución de soluciones de desinfección de endoscopios dispositivos. **Método:** Estudio cuantitativo, realizado en un alto de servicio de endoscopia en la ciudad de Belo Horizonte perteneciente al Sistema Nacional de Salud de Brasil, (SUS) entre el 28 de marzo de 2012 y 20 de marzo de 2013. Hubo un análisis documental de entradas de prueba realizados para el seguimiento diario de los procesos de desinfección químicos enese sector. Se utilizó estadística descriptiva con la distribución y medidas de tendencia central frecuencia. **Resultados:** Factores relacionados con la sustitución de la solución desinfectante de ácido peracético: concentración mínima requerida para bajar la solución (75%),volumen por debajo de la cantidad ideal (15%), presencia de los depósitos y derrame accidental de lasolución, tanto con 5%. El costo adicional estimado intercambios innecesarios fue de 66,6%.**Conclusión:** Hay una necesidad de revisar la planificación y protocolos de un servicio prioritario.

PALABRAS CLAVE: Endoscopía gastrointestinal. Desinfección. Ácido peracético. Saneantes.

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INTRODUCTION

Digestive endoscopy is a procedure carried out with the assistance of an endoscopic device for the diagnosis and treatment of several gastrointestinal diseases[1]. The demand for this procedure has grown in the past few years due to the increasing complaints of dyspepsia and the prevention and screening of cancer[2].

Endoscopic devices are expensive and consist of long channels, with complex design. They are made out of delicate material, which makes it more difficult to clean them; however, they are more easily damageable[3]. At use, the external and internal surfaces of these devices are exposed to several micro-organisms, which requires proper decontamination after each procedure to prevent cross-contamination, to increase the device's lifecycle, to protect the team that reprocesses it against infections and to prevent diagnostic errors, once fragments of biopsy could remain inside the device and be mixed with those of other patients[2,4].

It is recommended that, after use, endoscopic devices be submitted to high-level disinfection through liquid disinfectants, considering these are semi-critical and thermosensitive items[5,6]. This process leads to a minimum 6-log reduction in mycobacteria, and to the destruction of all other micro-organisms, except for prions and bacterial spores[7,8].

Working as high-level disinfectants, peracetic acid, glutaraldehyde and ortho-phthalaldehyde are usually used to reprocess endoscopes in Brazil. Its records are authorized by the Brazilian Health Surveillance Agency[9]. During reprocessing, the endoscopic device must be submerged in a high-level disinfectant right after the cleaning stage. The duration of the exposure of the device to each one of these solutions, as well as the expiration date proposed for the product and the prepared solution, is defined according to antimicrobial efficacy tests conducted by the manufacturers[10].

However, the effective disinfection of these devices is directly related to the quality of the use of disinfecting solutions. Many external factors can affect the efficacy of these solutions, like inefficient cleaning, which can compromise the sanitizing action, since the action of many solutions can be reduced or annulled when in contact with organic matter; the temperature of the used solution; the immersion of the endoscopic device, still wet, in the solution, leading to hyper dilution and the consequent change in the product's pH and concentration; and the time of exposure of the device to the disinfecting solution, besides the characteristics related to the device's washing and drying process[5].

Therefore, it has been recommended to monitor the disinfecting solutions in order to ensure its efficacy[10]. Then, with a chemical indicator, it is possible to assess the conditions of the solution regarding the minimum effective concentration (MEC) established by the manufacturer so that these solutions can have the proper effect. If the monitor shows, though changing colors, that the chemical solution is not in the established MEC, it should be discarded, even if prior to the expiration date. The solution must be monitored at least once a day before the beginning of activities[10]. Therefore, the use of high-level disinfectants in non-ideal conditions, causing flaws in the reprocessing stages of the endoscopic device, can be prevented[1].

Flaws in the reprocessing stages of endoscopic devices represent one of the main causes of cross-transmission of micro-organisms and formation of biofilm, which can be detached and contaminate the patient[11]. It is estimated that the rate of infection in gastrointestinal endoscopic procedures is of 1 in 1.8 million. However, these data may be underestimated, considering the sub-notification of cases, lack of surveillance from health services and long period of incubation of some infections[4].

It is expected that the results found can contribute with the establishment of protocols regarding the control of the chemical solution to plan for actions and to promote improvements in endoscopic services.

GENERAL OBJECTIVE

To identify the factors related to the replacement of disinfecting solutions for endoscopic devices.

METHOD

This was a quantitative study conducted in a high digestive endoscopy service of Belo Horizonte, belonging to a secondary reference unit of the Unified Health System (SUS). This service assists the State of Minas Gerais, and provides approximately 360 diagnostic digestive endoscopies per month.

In the referred service, a documentary analysis of records was conducted regarding the daily monitoring tests for the processes of chemical disinfection in the aforementioned

sector, from March 28, 2012, to March 20, 2013. If necessary, complementary records from the nursing service were consulted, such as the occurrence book in the digestive endoscopy service.

The solution control is registered in a document, and the MEC test strips for the peracetic acid solution are attached. Dates and reasons for the disposal/replacement of the peracetic acid solution were extracted from these documents to reach the results. A total of 216 MEC strips were analyzed in the study period. For the treatment of data, descriptive statistics with distribution of frequency and central tendency measurements were used. The collected data were typed and then statistically described, by calculating the percentages and being presented in a spread sheet.

Since this study does not involve the participation of human beings, it does not require the approval from the Research Ethics Committee of the institution, according to resolution 466/12. Therefore, a formal authorization to use the records was obtained from the service coordination.

RESULTS

The analyzed service has four endoscopic devices. Two of these devices are exclusively used in a solution of peraceltic acid and the two others, in a solution of glutaraldehyde, being submitted to high-level disinfection in their respective solutions since the first use.

The endoscopes processed in glutaraldehyde are only used when those processed in peracetic acid require maintenance, replacing them. That is, devices of preferential use are those processed in paracetic acid; therefore, the use of devices submitted to high-level disinfection with glutaraldehyde is reduced. Some of the reasons that limit the use of these devices are based on the reduced quality of the images provided by the equipment, besides the difficulty of the service to acquire the referred solution.

During the week, about 95 endoscopies are conducted and involve 2 work shifts: morning and afternoon. During the study period, 2,720 digestive endoscopy examinations were performed.

To monitor the solutions, 216 MEC strips used in the period were analyzed.

As to the solutions, during this period, peracetic acid supplied by the same manufacturer was prevalently used. Glutaraldehyde was only used four times, while the device processed in peracetic acid was under maintenance. Because of the little use of this solution, the strips monitoring it were not analyzed in this study.

To meet the objective of the study, of identifying the factors related to the replacement of disinfecting solutions for endoscopic devices, results will be presented according to the analysis of estimated and real time to replace the disinfecting solution in endoscopic devices, to the factors related to the solution exchange, and to the cost estimated for the solution exchange in the estimated and real time.

The exchange of the peracetic acid solution at use has been proposed for every 30 days, according to the manufacturer. Therefore, for the study period, it is estimated that this solution was exchanged 12 times; however, we observed it was replaced 20 times.

By analyzing the reasons that determined why the solution had to be discarded/replaced, the fact that in 75% of the cases the MEC strip indicated minimum concentration lower than the requirement to work efficiently as a high-level disinfectant stood out.

Another reason to replace the solution in 15% of the cases was owed to the fact that the mean volume of the solution in the recipient was inferior to the established one, to ensure the complete immersion of the whole surface of the endoscopic device.

It was also possible to observe, in 5% of the replacements, the presence of deposits in the solution, as well as the accidental spillage of the product in a similar percentage (Table 1).

Regarding the estimated cost for the exchange of the solution in the estimated and in the real time, it was observed that the replacement of the solution of peracetic acid was used 66.6% more often than predicted in the studied period. Concerning the economic impact of this use, we analyzed this extra cost for the replacement of solution for different reasons.

Table 1. Causes for the replacement of the peracetic acid solution before the predicted time. Belo Horizonte, 2014.

Causes to replace the sanitizing solution	Frequency (%)
Concentration below the established levels	75
Lower quantity than necessary	15
Dirt/residue	5
Spillage	5
Total	100

Therefore, considering the mean value of the 5 L container of peracetic acid to the value of R$ 400.00 used for every solution exchange, it is estimated that R$ 80,000 were spent on the product, whereas R$ 48,000 could have been spent, generating an impact on the system with an extra cost of R$ 32,000, according to table of costs of a supplier, with the current price of the market.

DISCUSSION

The peracetic acid is an efficient high-level disinfectant formed by the mixture of acetic acid (CH_3COOH) and hydrogen peroxide (H_2O_2) in an aqueous solution. It is found in several formulations with pH, ranging between 3 and 8.5, with a broad spectrum of activity and inactivation of gram-positive and gram-negative bacteria, fungi and yeast[1,12].

Little is known about its mechanism of action, but it is believed to work similarly to other oxidants. It denatures proteins, alters the permeability of the membrane and oxidizes the sulfhydryl radical and the sulfur bonds in proteins, enzymes and metabolites[7]. Depending on the composition, the products are used at room temperature or up to 56°C[1].

When compared to the glutaraldehyde, peracetic acid is safer for the manipulator, and its action is faster and less aggressive for the environment due to the low toxicity of its products of decomposition (acetic acid, water, oxygen, hydrogen and peroxide)[1,12].

In spite of that, peracetic acid is less stable. Depending on the storage conditions, the liquid form of the product is valid from 12 to 18 months, and the powder form, for three years, whereas glutaraldehyde is valid for 24 months[1]. Disadvantages include the strong vinegar smell and the incompatibility with some materials (bronze, copper, straight steel, and galvanized iron), presenting a corrosive action on them[7]. Before use, it is necessary to add an anticorrosive agent, which is sold with the product. There are records of irritation on skin, eyes and airways among people manipulating it[13,14].

The efficiency of the peracetic acid solution is directly associated with its pH[1]. Therefore, it is necessary to control the solution with a MEC strip. The MEC strip is an acid-base indicator, or pH indicator, presenting different colors according to the pH of the solution it is inserted in.

The use of pH indicators was introduced in the XVII century by Robert Boyle[15] and, ever since then, it has been used to measure the pH of different substances. In Brazil, the use of the strip to monitor peracetic solutions is recommended[10]. The use of a chemical indicator allows to assess, by reading the pH, the conditions of the solutions regarding the minimum effective concentration established by the manufacturer so it can have the desired effect.

In the analyzed service, the peracetic acid solution is stored in plastic containers with lids, and big enough for an endoscopic device. It can be controlled with a MEC strip every day, before the activities begin. Nursing assistants can do that, supervised by the nurse in charge of the sector. When necessary, the solution can be replaced by the nurse or by the nursing assistants who were trained to do that safely.

For the extra costs with the solution, whose volume exceeded the predicted exchanges in 66.6%, a high financial investment was observed. Considering this is a health service, and because of the precariousness of investments in it, especially for being a public service (SUS), this extra cost means a huge waste of money. In a scenario of difficulties related to investments in health, this amount could be used in other actions and benefit the users of the public health service.

Regarding the potential causes for the need to use a new peracetic acid solution, some analyses can be carried out.

The fact that, 75% of the time, the solution was discarded because the concentration was lower to the minimum established value for an effective high-level disinfection indicates an error while drying the device, between the stages of cleaning and disinfection. This finding leads us to infer that these devices were immersed still wet to be processed. The minimum established concentration for the product to be efficient ranges according to its formulation, informed by the manufacturer. The chemical disinfectant at use in the analyzed service has a 0.2% concentration of peracetic acid, and, at lower concentrations, the MEC strip needed to be changed.

Immersing the endoscopic device in sanitizing solution without drying it properly is against the guidelines of the institutional protocol and the norms established by the Brazilian Society of Nursing in Digestive Endoscopy and by the American Society for Gastrointestinal Endoscopy. The general protocol to process endoscopic devices consists of 5 stages:

1. pre-cleaning of the insertion tube,
2. leak test,
3. manual cleaning of the internal and external surfaces of the device, including the use of brushes and enzymatic detergent,

4. immersion of the device in high-level disinfecting solution for the time proposed by the manufacturer and washing,
5. drying and storage[16,17].

It is established that, after washing, and before the stage in which the device will be submitted to high-level disinfection, it is important to dry the endoscope externally and let dry as much as possible before placing it in the solution, in order to prevent the product from changing[16]. Therefore, alterations in the concentration and in the pH of the solution would be minimized/prevented.

It is also important to mention that, in case the endoscope is properly processed and stored according to the current guidelines, there is no evidence showing that a cycle of additional reprocessing immediately before use in the beginning of the day is necessary[16].

Another additional aspect refer to the fact that, by immerging the device in the high-level disinfectant, it is important to introduce the solution in all channels to prevent air bubbles, and to make sure the product is in touch with the entire internal and external surface of the equipment[17,18]. However, in case the solution inside the device is not removed before taking it out of the container with the sanitizing agent, it will be lost when the washing phase begins, which is the second most prevalent reason for the exchange of solutions, similarly to the reduced quantity of sanitizing agent in the container. In this case, when the complete immersion of the endoscopic device in the solution is not possible, its use is not recommended because the solution will not be in touch with all external and internal surfaces of the equipment[3].

The deposits found in the solution, which encouraged the exchange in 5% of the cases, such as glue residue at the extremity of the tube, according to the analysis of the maintenance of endoscopic devices, bring up a new discussion about the damage that can be caused by peracetic acid on endoscopic devices. It is known that the peracetic acid is incompatible with some materials, such as steel, copper and bronze, however, no reports of damage to the glue used in the device have been found in the literature[18].

Intercurrences causing the spillage of the solution represent 5% of the cases and indicate flaws in the actions of professionals regarding the use of the disinfectant.

Professionals working in endoscopy services, at the moment of admission and afterwards, should be trained in relation to the process of cleaning, disinfecting, sterilizing, storing and transporting endoscopic devices. They should also know about the mechanisms of action of the different solutions, expiration dates, norms for use, care regarding the risks for the operator/manipulator, besides the control of the efficacy of sanitizing agents[17,19].

In the analyzed service, all employees are trained at admission by the nurse in charge. However, the direct supervision during the activity is limited, once it does not occur during the entire work shift because of the lack of a nurse that can exclusively supervise the high-digestive endoscopy service during the working hours of the sector.

It is important to mention the different shifts of the nursing professionals, who change sectors every three months, from endoscopy to other departments, and the coordination is in charge of defining this sector.

CONCLUSION

The control of disinfecting solutions for endoscopic devices by strips that indicate the minimum effective concentration of sanitizing solutions is an important ally for the professional practice. It aims at ensuring a safe parameter for the processing of these devices, providing minimum objective conditions that indicate if the solution is adequate to work effectively.

From the identification of factors related to the replacement of disinfecting solutions of endoscopic devices, it is possible to establish measurements that aim at the improvement of the health sector.

The factors found for the replacement/disposal of the solution to disinfect endoscopes point out to the review of the service planning and protocols. Essential actions, such as the training of the nursing team regarding the stages of processing of endoscopic devices and its direct supervision as possibilities to minimize behaviors that interfere in the effectiveness of solutions, will also reduce the unnecessary exchanges and, therefore, save money and avoid extra costs.

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ANALYSIS OF THE SINGLE-USE LABEL OF STERNOTOMY BLADES

Análise do rótulo de uso único de lâminas para esternotomia

El análisis de la etiqueta del unico uso de las hojas de esternotomía

Vânia Sanches Bulgarelli[1], Eponina Nunes de Mello Bastos[2], Kazuko Uchikawa Graziano[3]

ABSTRACT: Objective: To analyze the legitimacy of label single-use blades to sternotomy by assessing the risk of sterilization failure and functionality. **Method:** Analytical research, based in an algorithm for decision making regarding the reuse of materials. **Results:** Based on the reference adopted, it was possible to classify the sternotomy blade reprocessing as low risk in terms of infection and loss of functionality after repeated use. **Conclusion:** The reuse of sternotomy blades is safe. The possibility of reuse must be defined at each use, taking into account the functionality informed by the surgeon. The integrity of the saw must be further confirmed by visual inspection using magnifying lens. Therefore, the material shall not be marketed as single use.
KEYWORDS: Equipment reuse. Patient safety. Sterilization. Cross infection. Health surveillance of products. Equipment and supplies.

RESUMO: Objetivo: Analisar a legitimidade do rótulo de uso único de lâminas para esternotomia por meio da avaliação do risco de falha na esterilização e na funcionalidade. **Método:** Pesquisa analítica, baseada em um fluxo para tomada de decisão de reúso de materiais de uso único. **Resultados:** Com base no referencial adotado, foi possível classificar o reprocessamento da lâmina para esternotomia como de baixo risco, tanto para infecção como para falha funcional. **Conclusão:** O reúso das lâminas para esternotomia é seguro, sendo o número máximo desta prática determinado pela avaliação da funcionalidade, a cada reúso, sob responsabilidade do cirurgião que a utilizou, complementada pela inspeção visual quanto à integridade dos "dentes" da serra por meio de lentes intensificadoras de imagem. Assim, não procede o material ser comercializado como de uso único.
PALAVRAS-CHAVE: Reutilização de equipamento. Segurança do paciente. Esterilização. Infecção hospitalar. Vigilância sanitária de produtos. Equipamentos e provisões.

RESUMEN: Objetivo: Analizar la legitimidad de la etiqueta cuchillas de un solo uso a esternotomía mediante la evaluación del riesgo de falla en la esterilización y la funcionalidad. **Método:** Investigación analítica basado en un flujo para la toma de decisiones reutilización de un solo. **Resultados:** En base a la referencia adoptada, fue posible clasificar el reprocesamiento de la hoja de esternotomía como de bajo riesgo de infección y para la insuficiencia funcional. **Conclusión:** La reutilización de hojas de esternotomía es seguro, con el número máximo de esta práctica se determinará en la evaluación de la funcionalidad, cada reutilización bajo la responsabilidad del cirujano que utiliza complementado mediante inspección visual que la integridad de los "dientes" de la sierra a través de lente intensificador de imagen. Por lo tanto, el material no se comercializa como un solo uso.
PALABRAS CLAVE: Equipo reutilizado. Seguridad del paciente. Esterilización. Infección hospitalaria. Vigilancia sanitária de produtos. Equipos y suministros.

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INTRODUCTION

A single-use health-related product is any product intended to be used in the prevention, diagnosis, therapy, rehabilitation, or contraception, usable only once, according to the specification of the manufacturer, and endorsed in Brazil by the National Health Surveillance Agency – ANVISA[1].

The single-use health-related products are being manufactured for over half a century. These emerged with the goal of providing assistance materials with guaranteed quality, ready to use, and also decreasing the overburden of health professionals, attributed to the reprocessing of materials. However, mainly due to the incorporation of high-cost technologies in products with single-use features, they have become less affordable to be used only once[2]. As a strategy, the health-care facilities began to reuse these products[3].

In Brazil, the current legislation[4] provides support for the health-care facilities to reuse products that are not included in the negative list[5], even if contradicting the indications of manufacturers to not reprocess them. The permission to reuse is subject to the demonstration of safety through validation tests[6].

In heart surgery, the total longitudinal sternotomy is the most common incision performed by surgeons to access the heart and great vessels because it allows an ample access to these structures[7]. To perform sternotomy, a saw with a stainless steel blade, labeled by the manufacturer as a single-use medical device, is used (Figures 1 and 2).

As shown in Figure 2, the blade for the sternotomy is a surgical instrument with a simple conformation and no internal spaces, of steel, and therefore autoclavable by saturated steam under pressure, non-implantable, without risk of being contaminated with prion particles and of high cost. This characterization leads to the question of why the product is for single use.

An author[8] stated that the permission for a category of products that manufacturers "recommended for single use" can mean legal basis for endless battles because it preserves the exemption from the manufacturer of the damage associated with the products if it occurs in reprocessing conditions. The conditions in which the manufacturer has this permission are not clearly determined in the legislation.

That said, this research intends to assess the legitimacy of the single-use label of sternotomy blades, focusing on the risk of infection and inadequate performance of the reprocessed product.

METHOD

This research was characterized as an analytical research. In the bibliographic search of the theoretical and methodological framework, the decision-making flow chart for reusing medical products designed for single use — "Reprocessing and reuse of single-use devices: review prioritization scheme" — proposed by the Food and Drug Administration of the United States of America (FDA-USA)[9] proved to be the most robust

Figure 1. Package of the blade used for sternotomy.

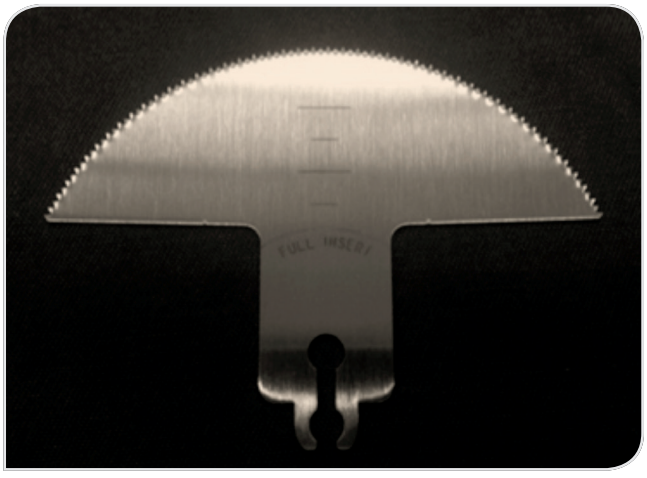


Figure 2. Stryker® brand blade used for sternotomy.

framework to answer the research question. Other bibliographical references on the subject were found in the systematic search through a research, without restrictions of time and language, in the Virtual Health Library (VHL) with the specific descriptor "equipment reuse," and incorporated into the development of the work. A search in a tree of scientific articles was also adopted, using the articles that were found, when it seemed appropriate, which contributed to the development of the work.

For purposes of categorization of injuries in the analysis of the blade for sternotomy due to functional failure in its reuse, the following definitions were used:

- **Light injury** – Product that is not used in cavities or internal spaces of the human body, which can be promptly replaced by a new one when the functional failure is discovered. For example, blades for sternotomy and electrocautery pens.
- **Serious injury** – Product that is used in cavities or internal spaces of the human body, which cannot be promptly replaced by a new one when there is a functional failure. For example, laparotomy stapler and angioplasty catheter.

RESULTS

The scheme proposed by the FDA-USA is presented as follows (Figures 3 and 4), with emphasis on the characteristics that apply to the saw blade used to perform sternotomy:

On the basis of the FDA-USA flow chart presented in Figure 3, the sternotomy blade is a critical device of simple conformation. The cleaning can be assured as shown in Figure 2.

As for functionality, the risk of a possible functional failure can be categorized as light injury because it is a "product not used in cavities or internal spaces of the human body, and, when the functional failure is discovered, it can be promptly replaced with a new one[9]".

DISCUSSION

The reprocessing and reuse of single-use products are controversial issues, although this practice is widespread in many countries. The high cost of some of them did cause an increase in hospital care costs, and this has stimulated, from the 1970s on, the growth in the reprocessing of this category of products to reduce costs. The reprocessing of single-use products can lead to recognized health risks if it is not carried out safely[10].

Entities and public agencies in other countries interfere, prohibiting the practice of reprocessing single-use devices. Agencies such as the Health Industry Manufacturers Association of the United States of America (HIMA), the Society of Gastroenterology Nurses (USA), and the Australian National Department of Health and Human Services disapprove the reuse of any product labeled by the manufacturer as single use because of the lack of rigorous tests to show the safety of this process[10].

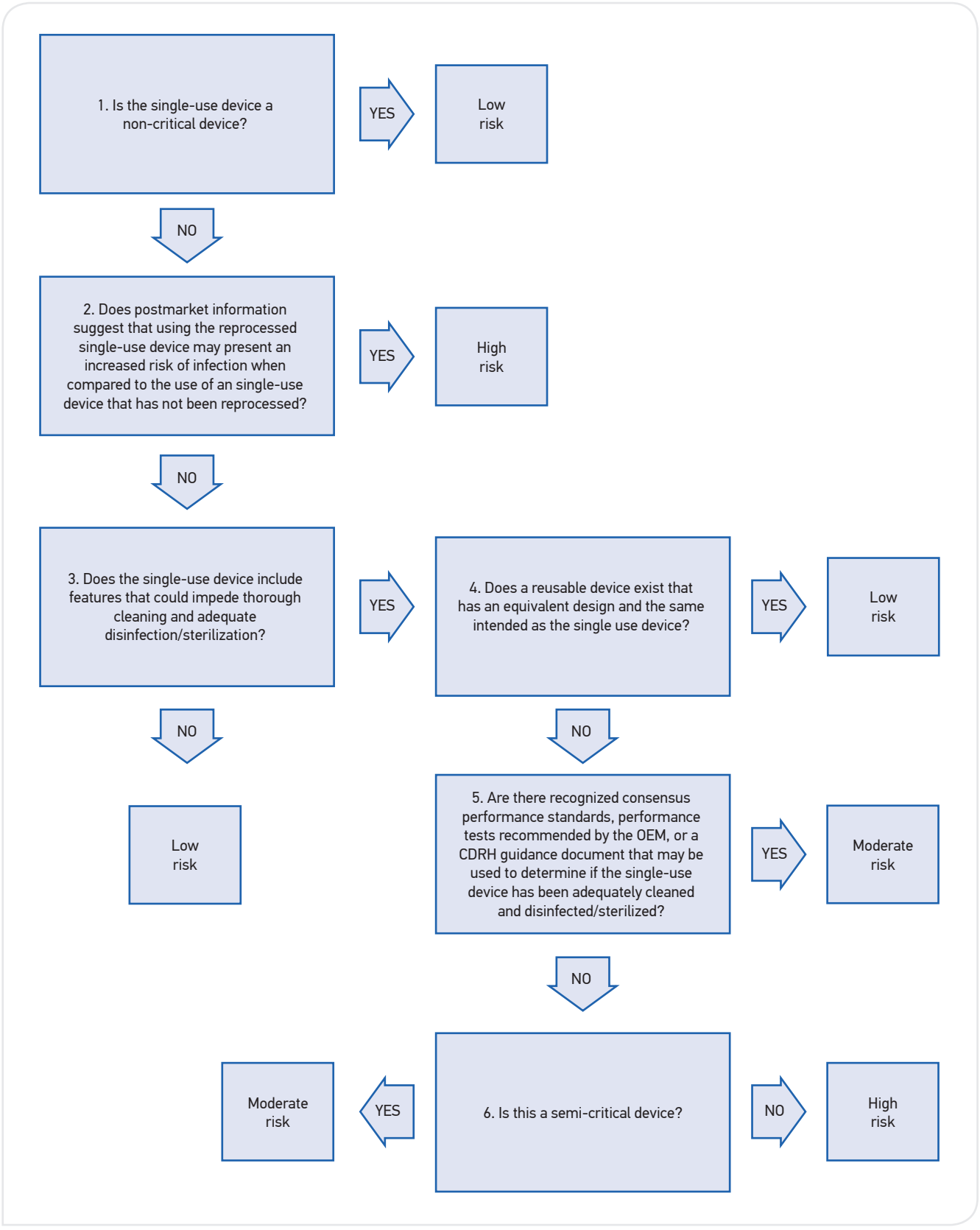
In France, the United Kingdom, Italy, Spain, and Switzerland, the reuse of single-use materials is prohibited, although the investigations in different countries adopt different rigors of the law — France and Britain have strict postures. In Africa, Asia, Eastern Europe, Central America, and South America — countries with few health and financial resources — the practice of reuse is prevalent[10].

The practice of reuse, however, is not limited to countries with few economic resources, but it is a universal problem, generating controversies[11]. Regarding the extension of the practice of reprocessing single-use devices, the American organization called General Accounting Office estimated in 2000 that 20 to 30% of the country's hospitals reused single-use devices[12]. Data from a Canadian organization, obtained through an extensive survey made in that country in 2001, suggested that 40% health institutions reprocessed single-use devices[13].

In Germany, Sweden, and the United States, remanufacturing outsourced companies process the materials under a regulation similar to the one used by the original manufacturers of the devices, following the guidelines of the Good Manufacturing Standards[13].

Though the practice of reuse is a reality, we must admit that it involves complex legal, security, ethical, and economic questions to be widely discussed[14].

The professional experience on the processes of a hospital specialized in Cardiology enabled the authors of this work to state that the single-use sternotomy blade is a widely reprocessed product in the daily routine due to the possibility of adequate cleaning and sterilization and the fact that it maintains satisfactory functionality after several processings.



OEM: Original equipment manufacturers; CDRH: Center for Devices and Radiological Health. Source: Food and Drug Administration, 2000.

Figure 3. Decision-making flow chart for the reuse of single-use products regarding the risk of infection, FDA-USA, 2000.

The lack of clearly defined criteria for the labeling of products for health as single use, which is one of the critical difficulties in the existing national legislation[8], and the professional experience of the researchers satisfactorily evaluating the performance of reused blades for sternotomy, as well as the safety in their reprocessing, led the authors to write this article based on the FDA guide "Reprocessing and reuse of single-use devices: Review Prioritization Scheme"[9].

On the basis of this decision-making flow chart, the single-use health-related products that are "noncritical" or "semi-critical," and even some "critical" with analytical judgment of low risk, may have the reuse authorized, provided there is a certainty of preserved functionality. Examples of this category would be the materials destined for the patient's health and comfort, such as bedpans, urinals, and kidney dishes (noncritical materials), Guedel cannula sets, some endoscopic and amnioscopic accessories (semicritical materials), sternotomy blades, and electrophysiology electrodes (critical materials). For this category of materials, clear routines for decontamination should be established: cleaning, disinfection, or sterilization, monitoring of the reused material's performance and criteria for disposal.

Ideally, all materials to be reused in health care should be cleaned and sterilized, but the Sterilized Material Centers have finite work capacity. Thus, the health-care facilities follow the classification based on the potential risk of these materials to transmit infection, thus classified[15]:

- **Critical** – these are the ones that come in direct contact with noncolonized human tissues and therefore considered sterile. These type of materials present high risk of infection transmission when contaminated with any type of microorganisms. Precleaning and sterilization of these devices are mandatory. For example, surgical instruments, intravenous catheters, and implant materials.
- **Semicritical** – these are the ones that come in contact with colonized mucous or broken skin (but limited to this) and can be exemplified by flexible endoscopes. The higher the density of the microbiota resident in a mucosal surface, the lower the chances of an exogenous microorganism adduced by the material to break into this place, "gaining" space. This category of materials should at least be subjected to high level disinfection after careful cleaning[16].
- **Noncritical** – these are the materials that come in contact only with intact skin, which is an effective barrier against most microorganisms, or materials that do not come into direct contact with the patient. They require cleaning with water, detergent, and friction from each use as a minimum procedure. For example, thermometers, stethoscopes, material for hygiene in bed (kidney trays and dishes), bedpans, and urinals.

This classification has been used as a guide for the adequate election of anti-infective protection methods related to materials.

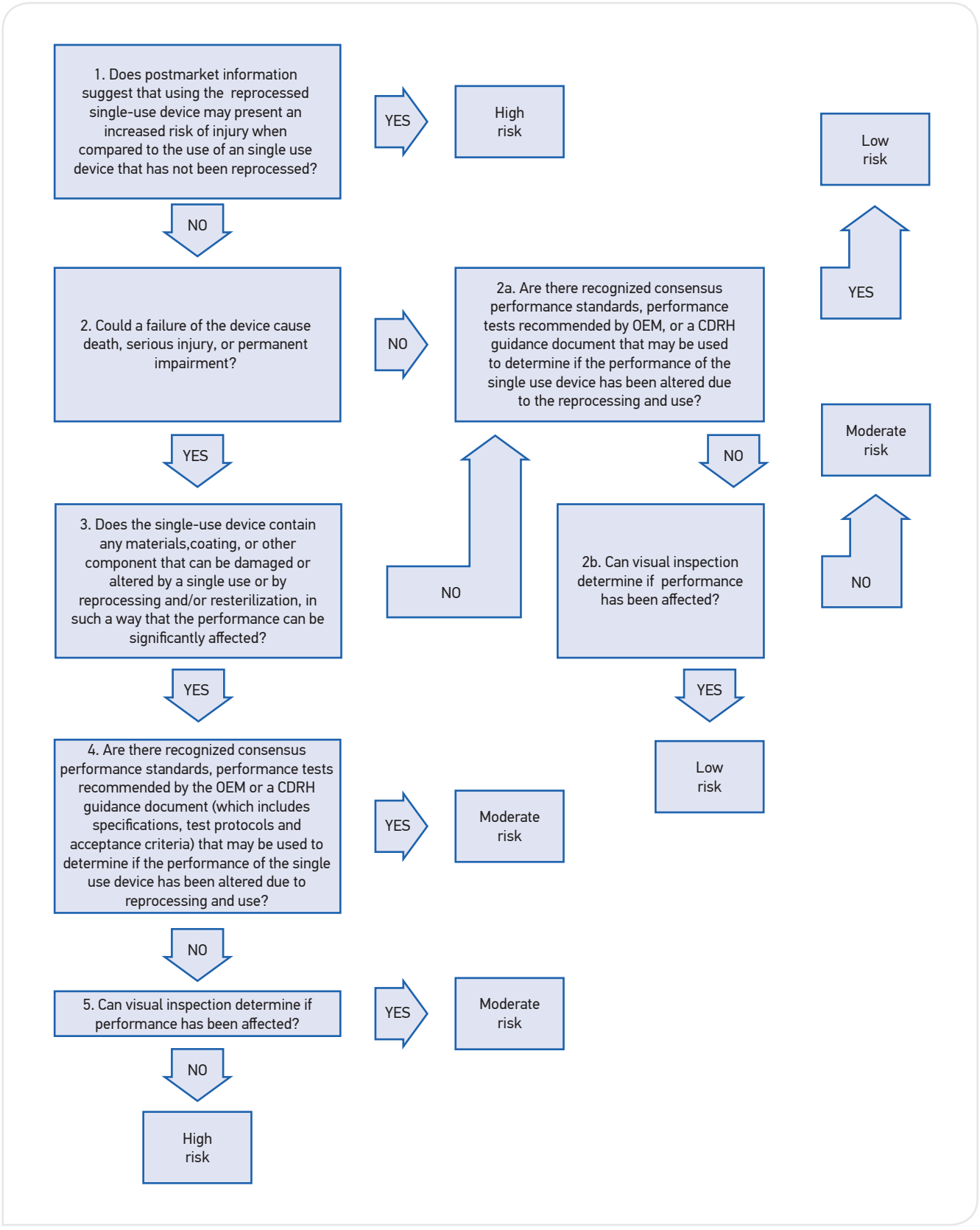
In the classification of materials, according to potential risk of infection[15], the blade used for sternotomy is classified as a critical article as it comes into direct contact with sterile human tissue.

Cleaning is considered the core of the safe reprocessing. In the literature, there are established criteria for the evaluation of the difficulties in cleaning single-use products[17]. Applying these criteria, the material in question presents zero risk. The sternotomy blade is a solid article without internal spaces and thus subject to safe cleaning, allowing the friction of its entire surface, and to sterilization by saturated steam under pressure. The unit cost of the material under analysis also justifies its reuse: a new sternotomy blade currently costs around R$ 253.00.

ANVISA, through the RE no 2606/2006[6] allows the reuse of single-use products in the conditions of absence of risk and justified reuse, but demands a reprocessing protocol with training for staff and monitoring the results.

In the institution where the authors develop their professional activities, there is a clear routine for the reuse of the sternotomy blades to guarantee the cleanliness and sterility of the blade, described as follows:

- Immersion in an enzymatic detergent solution with concentration, time, and temperature according to the recommendations of the manufacturer.
- Manual cleaning with the help of brushes with soft and firm bristles.
- Additional automated cleaning in ultrasonic washer for 10 minutes.
- Rinse in clean running water.
- Drying with the help of a clean and soft compress.



OEM: Original equipment manufacturers; CDRH: Center for Devices and Radiological Health. Source: Food and Drug Administration, 2000.

Figure 4. Decision-making flow chart for reuse of single-use products regarding the risk of inadequate performance, FDA-USA, 2000.

- Visual inspection as to the effectiveness of the cleaning and integrity of the "teeth" of the blade using 8X image intensifier lenses[18].
- Packaging in surgical grade paper/film and placing inside a metal box with the saw and the battery.
- Sterilization in a high-pressure saturated steam autoclave with prevacuum at 134°C for 5 minutes.

That said, this material, which is classified as "low risk for infection," like the majority of surgical instruments, can be safely reused concerning the issue of decontamination of critical material, refuting the single-use recommendation of the label.

As for the functional risk, the manufacturer states in its instruction manual that the stress and the tension of the cleaning and sterilization change the physical and chemical characteristics of the blade. However, it does not present supporting data that this process may lead to an injury risk. It also states that complex systems are needed to control the blade's cutting quality every time it is reprocessed, and that the cost required to test all the blades at each reprocessing, to compare them to a new blade, is high*.

Despite these indications by the manufacturer, the practice of reuse does not suggest that the reuse increases the risk of injuries to the blade when compared to a new one. The authors have no knowledge of reports of failure in the performance of the blade that has caused injuries.

So far, there are no performance evaluation tests for the blade other than the evaluation through visual inspection to ensure the integrity of the "teeth" of the blade. Although subject to questioning, the functionality of the blade used for sternotomy is verified by the cardiac surgeon during the surgical procedure, and this classifies it as of "moderate functionality risk" in the decision-making flow chart proposed by the FDA[9]. That is moderate, and not serious, because the blade with impaired function can be promptly replaced by a new one without causing harm to the patient. The Sterilized Material Center does not have know-how nor infrastructure to pretest the functionality of the sternotomy blade regarding its incision function.

Brazil is a country of scarce resources, and the single use of the sternotomy blade characterizes waste. Some manufacturers of non-reprocessable devices of complex conformation and high cost have advanced on the issue of their reuse. The surgery material industry for robotics is one of them. The clamps of the surgical kit for this type of surgery currently have a considerable unit cost of around US$ 2,500.00. The manufacturer, recognizing the need for reuse of these, authorizes a maximum number of 10 reuses, accompanied by instructions for reprocessing. One can only hope that all companies producing expensive single-use materials mirror the spirit of the robotic surgery industry!

CONCLUSION

The sternotomy blade marketed as of single use does not justify the single-use recommendation because it is a product subject to safe consecutive cleaning and sterilization through saturated steam under pressure. In addition, the functionality is preserved for several reuses. If there is a failure in the performance of the blade, the injury to the patient is considered mild because the blade may be readily replaced by a new one. The risk analysis of the reuse of the sternotomy blade marketed as single-use provided an opportunity for the reflection about the pressing need for more rigorous criteria in the registration of products as single use by ANVISA as the health regulating agency of Brazil. Although the existing legislation provides legal support for the health institutions when it comes to reusing single-use devices through validation, the reuse of single-use products causes discomfort in the relationship between the institution and the manufacturer, the health authority and the patient, and his or her family members.

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PATIENTS IN INTENSIVE CARE BED IN REAR RECOVERY POSTANESTHETIC

Pacientes de cuidados intensivos em leito de retaguarda na recuperação pós-anestésica

Pacientes en cama de cuidados intensivos en recuperación posterior postanestésica

Priscilla Nascimento[1], Dulcilene Pereira Jardim[2]

ABSTRACT: Objective: To identify the length of stay and the main difficulties in the nursing care of critically ill patients in bed in rear Post Anesthetic Care Unit. **Method:** it is an experience report of a researcher while Nurse Post Anesthetic Recovery of a university hospital in the southern city of São Paulo. **Results:** In 12 months 8,395 patients were admitted, of which 129 were severe patients who remained in the rear bed on average by 41.4 hours awaiting release of beds in the intensive care unit. Difficulties in assisting refer to admission, dilution and installation of drug infusion pumps, changing positions, bed bath, administration of diet, healing, polls, and transportation for exams. **Conclusion:** We emphasize the need for appropriate use of sector for post-operative recovery of patients, and that the presence of critically ill patients in rear bed requires adaptation of the professional staff in number and specificity.
KEYWORDS: Anesthesia recovery period. Recuperação room. Operating room nursing. Intensive care. Residence time.

RESUMO: Objetivo: Identificar o tempo de permanência e as principais dificuldades na assistência de enfermagem a pacientes graves em leito de retaguarda na Recuperação Pós-Anestésica. **Método:** Trata-se de um relato de experiência da pesquisadora enquanto enfermeira da Recuperação Pós-Anestésica de um hospital universitário na zona sul da cidade de São Paulo. **Resultados:** Em 12 meses, foram admitidos 8.395 pacientes, sendo que 129 eram pacientes graves que permaneceram em leito de retaguarda em média por 41,4 horas aguardando liberação de leitos na unidade de terapia intensiva. As dificuldades na assistência se referem à admissão, diluição e instalação de drogas em bombas de infusão, mudança de decúbito, banho no leito, administração de dieta, curativos, sondagens, e transporte para exames. **Conclusão:** Ressalta-se a necessidade da utilização adequada do setor para a recuperação pós-operatória dos pacientes, e que a presença de pacientes graves em leito de retaguarda requer adequação do quadro de profissionais em número e especificidade.
PALAVRAS-CHAVE: Período de recuperação da anestesia. Sala de recuperação. Enfermagem de centro cirúrgico. Terapia Intensiva. Tempo de Permanência.

RESUMEN: Objetivo: Identificar la duración de la estancia y de las principales dificultades en la atención de enfermería de los pacientes críticamente enfermos en cama Anestésico Recuperación. **Método:** se trata de un relato de experiencia de un investigador, mientras que la enfermera Publicar Anestésico Recuperación de un hospital universitario de la ciudad del sur de São Paulo. **Resultados:** 12 meses 8.395 pacientes fueron ingresados, de los cuales 129 eran pacientes graves que se quedaron en la cama trasera en un promedio de 41,4 horas a la espera de la liberación de camas en la unidad de cuidados intensivos. Las dificultades en la asistencia se refiere a la admisión, la dilución y la instalación de bombas de infusión de medicamentos, posiciones cambiantes, baño en la cama, la administración de la dieta, la curación, las encuestas, y el transporte para los exámenes. **Conclusión:** Hacemos hincapié en la necesidad de un uso adecuado de sector para la recuperación postoperatoria de los pacientes, y que la presencia de los pacientes críticamente enfermos en la cama trasera requiere una adaptación del personal profesional en número y especificidad.
PALABRAS CLAVE: Periodo de recuperación de la anestesia. Sala de recuperación. Enfermería Quirófano. Cuidados intensivos. Tiempo de residencia.

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INTRODUCTION

After the anesthetic-surgical procedure, a critical period begins for the patients, who should remain under the constant observation and care from the nursing staff to prevent common intercurrences of the post-anesthesia period. In the event of such occurrences, professionals must be able to provide these patients with immediate medical care[1].

The surgical patient is usually referred to the Post-anesthesia Care Unit (PACU), which aims at providing care until patients are fully recovered from the effects of anesthesia, regaining motor and sensory functions, stable vital signs, and showing no evidence of hemorrhage, nausea or vomit[2].

For this type of service, the PACU must be located near the operating rooms (OR), have the same number of beds as the existing ORs +1, be equipped with material resources and proper equipment, as well as with the necessary human resources for immediate postoperative care, that is, a nursing technician for every three beds and a nurse for every eight beds of non-critical patients[1].

However, not all patients are referred to the PACU after the anesthetic-surgical procedure, which is even less common for major surgeries, for older patients with pre-existing conditions, in cases when specialized and/or constant therapeutic support are necessary or when life is at risk. In these cases, the immediate postoperative period (IPP) usually takes place in the Intensive Care Unit (ICU), given the severe conditions of such patients.

Recently, because of the high demand of patients in severe conditions and the limited number of beds in the ICU, some critical patients have remained on the pre-recovery bed at the PACU until all beds in the ICU are released[3].

It is worth mentioning that, in these cases, there should be an adaptation of human resources, i.e., a nurse for every three or four beds due to the higher complexity of care[1], although this proportion is not always adopted by the institution given the lack of professionals[4].

The presence of critically ill patients in the PACU requires a readjustment from the nursing staff, since the services provided by these professionals are complex, like ventilatory support, invasive monitoring, probe, drain and urine output, administration of medications through infusion pump and enteral diets, measures to prevent pressure ulcer, among other activities.

Due to the increasing reality of critically ill patients on pre-recovery beds at the PACU, it is important to know the experiences in this context in order to learn more about the changes affecting the sector's routine; therefore, it is possible to adapt both the structure and the preparation of the nursing staff for the intensive care of these patients.

OBJECTIVE

To identify the length of stay and the main difficulties from this period in nursing care provided for critically ill patients on pre-recovery beds at the PACU.

METHOD

This is a descriptive research and a case report focusing on a phenomenon that society is unaware of or knows little about through the analysis of data to build a scenario. The research is based on the statement that problems can be solved and practices can be improved by the description and analysis of objective and direct observations[5,6].

This investigation aims at describing the researcher experience at the PACU of a large university hospital, characterized as an emergency unit covering an area that comprises more than 5 million residents in the city of São Paulo (SP), besides receiving patients from other states. The institution performs about 1,600 surgical procedures per month. Every day, about 4 thousand outpatients attend the units and one thousand patients are admitted for all medical specialties, including highly complex procedures. There are 114 intensive care beds distributed in 10 adult ICUs, 9 beds in the pediatric ICU and 21 beds in the neonatal ICU.

The surgical center (SC) of the institution has 22 ORs, being 3 used for obstetric care. Minor, intermediate and major surgeries were performed in the following specialties: heart, pediatrics, head and neck, gastric surgery, urology, neurology, ophthalmology, otorhinolaryngology, orthopedics, gynecology, plastics, and human reproduction.

One resident in anesthesiology is in charge of 8 beds in the PACU (from 7 to 5 pm, Mondays to Fridays), and is also responsible for the patients' discharge from the IPP, intensive care and urgency/emergency. In his/her absence, the current anesthetic manager of the SC chooses another physician. The

PACU staff comprises 5 nurses, 2 in the morning, 1 in the afternoon, 1 in each night shift; and 16 nursing assistants/technicians, 4 in each shift.

Data were collected from September 2012 to August 2013 from the PACU records, which register the number of patients assisted on the day and the information about personal identification and anesthetic-surgical procedures.

Because of the public institution characteristics — being an emergency unit — many major surgeries are performed in critically ill patients, who should be admitted to the ICU in the postoperative period; however, the number of ICU beds available in the institution is inversely proportional to reality. It is necessary to allocate these patients in the PACU to ICU pre-recovery beds, until the beds in intensive care are released.

RESULTS

In the studied period, 8,395 (100%) patients were assisted at the PACU. Out of these, 129 (1.5%) were critically ill patients (priority 1) who remained on pre-recovery beds, whose detailed description is in Chart 1.

In the institution, critically ill patients are classified as priorities 1, 2 or 3 in the prioritization model for ICU admission. They use the classification as follows:

- priority 1 – patients in severe and unstable conditions, who cannot be offered monitoring and treatment outside the ICU;
- priority 2 – patients who require continuous monitoring and possible emergency interventions;
- priority 3 – critically ill patients, with reduced changes of recovery associated with the nature of the comorbidity; and
- priority 4 – patients who would not benefit from intensive care because of the low risk or little need for an emergency intervention or patients with irreversible terminal diseases[7].

The length of stay of 129 critically ill patients on pre-recovery beds from the PACU in the studied period varied from 3 to 384 hours, and the average time was 41.4 hours (1.7 days). The detailed description is in Chart 2.

There are many difficulties regarding the nursing care for critically ill patients on Post-Anesthetic pre-recovery beds at the PACU, starting with admission. It takes time to prepare the bed, to receive the patients and to monitor and identify their clinical condition in the changes of shifts and the phases of Nursing Care Systematization (NCS). There

Chart 1. Distribution of critically ill patients on pre-recovery beds at the post-anesthesia recovery unit per period. 2013

Period	Critically ill patients on pre-recovery beds at PACU
2012 September	10
2012 October	12
2012 November	11
2012 December	7
2013 January	13
2013 February	13
2013 March	18
2013 April	9
2013 May	10
2013 June	9
2013 July	9
2013 August	7
Total	128

PACU: Post-anesthesia Care Unit.

Chart 2. Distribution of critically ill patients according to length of stay on pre-recovery beds at the post-anesthesia recovery unit. 2013.

Length of stay on recovery beds at PACU	Number of critically ill patients
3 hours	3
6 hours	20
12 hours	13
24 hours (1 day)	41
48 hours (2 days)	21
72 hours (3 days)	14
96 hours (4 days)	7
120 hours (5 days)	3
144 hours (6 days)	3
168 hours (7 days)	1
192 hours (8 days)	2
Total	128
Average time of stay: 41.4 hours (1.7 days)	

PACU: Post-anesthesia Care Unit.

are other factors, like the dilution and installation of drugs, infusion pumps and other equipment, such as the mechanical ventilator.

These patients require other procedures, which are not part of the PACU's routine, such as changing positions, bed bath, administration of medications and diet, among other little and medium complexity procedures. Mostly, nursing technicians perform these procedures, whereas the PACU nurse is exclusively in charge of surgical wound dressings, probes, installation of hemoderivatives, and other highly complex procedures.

The performance of some of these procedures requires the collaboration of at least two employees; therefore, the team involved in caring for patients on pre-recovery beds and those in IPP is overloaded.

The nursing team of this institution follows the guidelines established by the Brazilian Society of Surgical Center Nurses, Anesthesia Recovery, Sterilization And Center Of Material Storage (SOBECC)[1] for PACU care to critically ill patients. However, the team is often incomplete because of days off, unjustified absence or medical leave from collaborators, causing dissatisfaction and stress on the rest of the staff.

If two or more members are absent, a professional from the SC is transferred to the PACU; however this person usually has no experience in this type of service, which makes the other members of the staff feel insecure.

Professionals feel overloaded when providing care for critically ill patients on pre-recovery beds for the ICU, not to mention the other patients in the IPP, the time spent to complete forms and other administrative processes.

The PACU staff performs the laboratory exams and sends them to the central laboratory of the hospital by the management support staff of the SC, and the period between the exams and the results does not compromise the service.

When an appointment is required with an intensive care physician and doctors from specific subjects, as well as other health professionals, the resident in anesthesiology at the PACU or the surgeon in charge for the patient requests this service. Then, the nurse from the PACU contacts the team.

The most required collaborator in the multi-professional staff is the physical therapist, since respiratory physical therapy is necessary for patients with orotracheal intubation (OTI) and to handle mechanical ventilation devices.

There are no visiting hours at the PACU; however, because there are patients on pre-recovery beds, whose length of stay is long, we need to respect patient and the family's right, even if this access is difficult (starting by the location of the PACU inside the SC, because it is necessary to cross the corridor of ORs, not to mention the characteristics of the sector, with reduced flow of staff and proper clothing).

The visiting period for these patients lasts one hour in the afternoon shift, and only two family members can enter the room, one at a time, but for no longer than ten minutes. In exceptional cases, of critically ill patients with bad prognosis and with department's authorization, more visitors can be allowed.

Critically ill patient happens are moved in two moments: for the performance of computed tomography (CT) and to be transferred from the PACU to the ICU, in case there is a bed available. Two nursing technicians from the PACU and a medical resident are in charge if the patient depends on mechanical ventilation; but when on non-invasive ventilation, a nursing technician and a nurse from the PACU can do the process.

This practice is also a significant reason of dissatisfaction and stress of the staff regarding the waiting time for the elevators, preparation of the patient to be transferred from the sector, and a new admission to the PACU after undergoing the exam.

The patients are discharged from the PACU when they are transferred to the ICU to continue the treatment, when the patient gets better and is referred to the nursing ward or to another hospital, or in case of death.

DISCUSSION

Nursing care addressed to critically ill patients on pre-recovery beds at the PACU is different from the unit's routine, starting with the length of stay of patients on these beds and their needs.

Literature shows that the length of stay of non-critically ill patients at the PACU is of about 2 hours, a period when most patients reach the maximum score in the Aldrete-Kroulik Index[8,9]. However, this IPP period can be reduced in case of elective or minor surgeries.

In this study, the length of stay of critically ill patient's on pre-recovery beds at the PACU was of 41.4 hours (1.7 days), that is, much higher than that of non-critically ill patients. This fact has a direct impact on the sector's bed turnover rate, thus forcing the postoperative recovery of patients

in the OR, followed by SC professionals who may not be experienced in evaluation of patients, besides the increasing rotation time of the room, and the consequent delay in surgery mapping.

In a study performed in another public institution in São Paulo, the same need to use the pre-recovery bed at the PACU was observed, with an average patient's length of stay of 27 hours. However, this study included critically ill and non-critically ill patients who were waiting for a bed release in the ICU and in the nursing ward, respectively. In the case of non-critically ill patients, the hospitalization period was shorter, therefore, sometimes the patient was discharged from the PACU and could go home[3].

Literature points out that the average time of hospitalization in Brazilian ICUs is 6 days long, and in international institutions, 5.3 days[10,11]. The mean stay on pre-recovery beds in this study (41.4 hours or 1.7 days) was lower than the national and international means because the patients were transferred from the PACU to the ICU when beds were made available, ensuring the continuity of care.

The prolonged length of stay and clinical picture of these patients have some difficult aspects regarding nursing care, which requires more time to perform highly complex procedures from the nursing professional.

There is the need for more surveillance of the intubated patient, as well as more employees involved in care, because of the possibility of extubation during procedures such as changing positions, bed bath, among others, and also in cases of self-extubation, if the patient presents agitation, neurological changes or major respiratory discomfort, which would cause damages or complications to the user[12].

Handling mechanical ventilation equipment, infusion pumps, among others, may cause insecurity in the professional, since it is unusual equipment in the PACU reality[3].

With regard to the performance of more complex procedures, such as changing positions and bed bath, it is possible to observe that the members of the nursing team collaborate with each other, since these activities may require more physical effort from the professional, so the support from one or more collaborators is necessary[3].

Therefore, we emphasize the importance of adjusting the number of collaborators in the area, since it is a known fact that the reduced number of employees in the PACU is a reason of distress for professionals in many hospitals, which count only with the presence of assistants and/or technicians who end up being indirectly supervised by the SC nurse. This is a fact that makes individual and high-quality care difficult, especially in situations of emergency[3].

The inappropriate number of employees caring for patients on pre-recovery beds while working with IPP patients may overload such professionals, and have an impact not only on the quality of care, but also on medical records. This corroborates the limited quality of nursing records, which is a constant challenge for this category[8].

Visits of intensive care physicians and other specialists (i.e., physical therapists, occupational therapists) are very delicate, since they are not familiar with the location of the PACU in the institution or with the procedure regarding the proper clothes to enter in the sector. So, these professionals may be late, especially for emergency situations.

Thus, cases of cardiorespiratory arrest, clinical pictures of hypovolemic, cardiogenic, neurogenic, anaphylactic, and septic shocks, hemorrhages, seizures, among other intercurrences, cause a high level of stress on the PACU staff.

Visits of family members are not different. They face some difficulties to access the sector and to wear the proper clothes, besides the fact that they interfere in the nursing routine, because of the time spent to prepare them to enter the PACU and answer their doubts about surgery, recovery and possible discharge date. Usually, the team is unaware of this information[3].

However, the department and the professionals should adapt to receive the patient's family, given their importance for recovery and considering the guarantee of their rights[13,14].

Hence, the nursing staff fatigue is related to the large number of therapeutic activities and to the time they spend in intensive and postoperative care, simultaneously.

Professionals need to adapt to the specific routine at the PACU, as well as to the new and equally specific and demanding routines and flows with the critical patient, which is typical in ICU care.

Therefore, these members of the staff should not only be technically skilled to work at the PACU, but also have knowledge and special abilities addressed to caring for the critically

ill patient with long length of stay in the sector, requiring specialized orientation and training[3].

The SC and the PACU environments alone involve heavy emotional load (because it is a closed, critical department, with high levels of stress); add to that the characteristics of the ICU characteristics, that is, a place of instability, closeness to death and the tension from intensive care tension, besides the relationship with the patients' family members, and there may be consequences on the professional's physical and mental health.

Thus, it is worth to emphasize the need to adjust the nursing staff, to provide the proper number of nurses and nursing technicians associated with the number of beds, as well as the characteristics of patients as to the level of care they require, besides ensuring the proper technical training for these professionals.

FINAL CONSIDERATIONS

The admission of patients referred to intensive care to the PACU has become a common practice recently, because of the increasing demand of this profile of patients, which is not proportional with the number of ICU beds available.

The institution analyzed in this paper experienced this reality and, in a 12-month period, the PACU received 8,395 (100%) patients; among them, 129 (1.5%) were critically ill patients waiting to be transferred to the ICU. The mean length of stay of these patients on pre-recovery beds at the PACU was of 41.4 hours, resulting in the low turnover of beds and the consequent need for surgery patients to recover in the OR, which also has a direct impact on the course of the surgery mapping.

It has been observed that the difficulties faced by the nursing staff in relation to these patients during this period begin at admission, because of the time spent on bed preparation, besides, the patient's reception, monitoring, and identification of clinical picture. There is also the dilution and installation of drugs and infusion pumps and other equipment, such as the mechanical ventilator.

It is also necessary to conduct activities such as changing positions, bed baths, administration of diets, dressings, probes, blood infusions and to transfer the patients who need to undergo exams. These actions are not common at the PACU's routine. Besides, an extra professional is required for many of these activities, which overloads the team.

Multiprofessional care in routine situations, and especially in emergencies, is stressfull because of the difficulty to the PACU. This is also true for family visits.

The different routines in the PACU and the work overload lead to discomfort and stress for the team. So, the need for the proper use of the sector for the postoperative recovery of patients is emphasized and may be assessed by indexes used in the unit.

Nevertheless, given the increasing presence of critically ill patients on pre-recovery beds at the PACU, there is the need to adapt the number of nursing professionals in the sector, associated with the number of patients, as well as the characteristics of these patients concerning the level of care, besides the proper technical training to provide a safe and humanized service.

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HOT FOOTBATH THERAPY: TAKING CARE OF THE NURSING AT THE CENTRE FOR MATERIAL AND STERILIZATION

Escalda-pés: cuidando da enfermagem no Centro de Material e Esterilização

Escaldado de pies: cuidando de enfermería en el Centro de Material y Esterilización

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ABSTRACT: Objective: To report and analyze the use of hot footbath therapy as strategy for promotion of quality of life at work (QLW) for the nursing staff of the Center for Supply and Sterilization (CME) of a University Hospital. **Method:** Experience report with a qualitative study of the use of hot footbath therapy technique in 18 nursing professionals at CME, from August to December 2010, once a week, totaling 11 meetings. The technique of response analysis was content analysis. **Results:** Two thematic categories were identified. The reports showed that this strategy provided well-being at work and led the professionals to reflect on the concept of ambience, their working conditions, and the importance of self-care. **Conclusion:** It is hoped that QLW becomes an institutional policy at hospitals, for the appreciation and care of employee reflecting in lower rates of absenteeism and improved service quality.
KEYWORDS: Nursing. Quality of Life. Sterilization.

RESUMO: Objetivo: Relatar e analisar a utilização do escalda-pés como estratégia de promoção de qualidade de vida no trabalho (QVT) para a equipe de enfermagem do Centro de Material e Esterilização (CME) de um hospital universitário. **Método:** Trata-se de um relato de experiência com abordagem qualitativa da aplicação da técnica do escalda-pés em 18 trabalhadores de enfermagem do CME, no período de agosto a dezembro de 2010, uma vez por semana, totalizando 11 encontros. A técnica de verificação das respostas obtidas foi a análise de conteúdo. **Resultados:** Identificaram-se duas categorias temáticas. Os discursos evidenciaram que a adoção dessa estratégia proporcionou a sensação de bem-estar ao trabalhador e o fez refletir sobre o conceito de ambiência, suas condições de trabalho e a importância de se autocuidar. **Conclusão:** Espera-se que a QVT se torne uma política institucional no hospital em questão e em outros, pois a valorização e o cuidado com o trabalhador refletirão significativamente na diminuição das taxas de absenteísmo e na melhoria da qualidade do serviço prestado.
PALAVRAS-CHAVE: Enfermagem. Qualidade de vida. Esterilização.

RESUMEN: Objetivo: Relatar y analizar la utilización de la escalda de pies como estrategia de promoción de calidad de vida en el trabajo (QVT) para enfermería del Centro de Material y esterilización del Hospital Universitario. **Método:** Relato de experiencia con un enfoque cualitativo. Realizó el escalda de pies y dos reuniones de evaluación del proyecto. El análisis de las respuestas fue el análisis del contexto. **Resultados:** Se identificó dos categorías temáticas. Los discursos evidenciaron que la estrategia proporciono la sensación de bienestar del trabajador y hicieron reflexionar sobre el concepto de ambientar sus condiciones de trabajo y la importancia de auto cuidado. **Conclusión:** Espera que la QTV se transforme una política institucional en el HC-UFMG, pues la valorización y el cuidado con el trabajador hará reflexionar significantemente la disminución de las tasas de ausentismo y la mejoría de la calidad del servicio prestado.
PALABRAS CLAVE: Enfermería. Calidad de vida. Esterilización.

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INTRODUCTION

This study aimed at sharing the experience of the use of hot footbath therapies as a means to promote quality of life at work (QLW) for the nursing staff at the Material and Sterilization Center (MSC) of the Hospital of Universidade Federal de Minas Gerais (HC-UFMG). This experience was lived in the outreach project "Strategies to promote awareness of the quality of life at work," linked to the People Management Laboratory (LAGEPE) of the Nursing School of UFMG.

The LAGEPE is an outreach program created in 2008 that seeks the effective integration of teachers and students with the service professionals through interventions in nursing practices, constituting a permanent space for analysis and reflection of interpersonal relationships, professional practice, and QLW.

This work is key in people's lives as it represents a growth element, personal fulfillment, and a means of survival, also dignifying, assigning status, and generating recognition[1]. When working conditions are at odds with the workers' expectations and needs, one may face intense suffering and even illnesses, both represented by increasing absenteeism.

In addition, the abuse of rules, routines, and requirements in the work environment prevents the worker from transforming and re-creating their practices. Thus, just as the work environment can generate pleasure, it may also reflect negatively on the workers' health, causing suffering, tension, conflicts, stress, wear, and illnesses[2].

It is, therefore, responsibility of the organization and management team to create a favorable working environment, ensuring the structure and organization necessary for a productive and feasible work process. We highlight the importance of considering the human being as a "thinking being" full of subjectivity, rather than only "muscle being"[3].

Thus, a work space where people can express themselves and listen to others can bring benefits, hence reorganization of the work process. Awareness of factors causing satisfaction and suffering can be the starting point for organizations and workers themselves to boost their practices into a more pleasurable, collaborative, and therefore human direction, targeting QLW[2].

QLW is a complex concept due to its subjective, composite, and multidimensional nature[4]. It comprehends satisfaction, motivation, health, and safety at work, also depending on intrinsic and extrinsic factors. Its meaning varies from person to person, but it is directly related to the work process organization and the technologies used in it.

When it comes to nursing, a profession characterized by the care to others, quality of life in health-care routine is extremely important. The absence of conditions contributing to a work environment that provides workers with satisfaction and well-being can change the final product of this work: (direct or indirect) assistance to patients.

The work environment in nursing is marked by factors that cause physical and mental overload, such as stressful and tiring tasks, repetitiveness and monotony, uncomfortable and incorrect positions, working hours divided in several shifts, fast-paced work, long working hours, and pressure of productivity and time to perform tasks. In addition, professionals encounter conflicting interpersonal relationships, no career or wage planning in most organizations, reduced possibility of professional growing, low wages, fragmentation of manual and intellectual work, strongly hierarchical structure, and insufficient quantitative and qualitative sizing[5].

Exhausting work routine can result in eating, sleep, and physiological elimination disorders; fatigue; problems in body systems; decreased alertness; stress; familial disorganization; and neuroses, causing work accidents and large number of leaves for health reasons[5].

Absenteeism, that is, absence from work justified for disease with certificate, sick leave, removal for private reasons supported by law, and delay or abandonment of service before completion of the work load, is present in nursing routine[1].

The work environment is also a determining factor for quality of life and the health-disease process of professionals, as elements such as excessive noise, poor lighting, extreme temperatures, hygiene, aesthetics, and others can directly affect productivity and well-being[5].

MSC, a unit that is linked to virtually all sectors of the hospital to supply them with sterile products (Surgical Center, inpatient and outpatient units, emergency, etc.), is characterized by a fragmented, mechanical, uncreative

work process, similar to that of an industry, based on a sequential form of processing materials and demanding productivity[6].

In addition, this important sector has the responsibility of allocating workers with health problems and outdated knowledge, that is, who are unable to work in other units requiring more theoretical and practical training. This leads this sector to be recognized as a place of low complexity and less prestigious by nursing staff itself.

MSC at HC-UFMG adopts the same work process of most MSCs in Brazil, with work routine split in three shifts, production scale, productivity requirement, and repetitive and fragmented activities in a closed environment. Despite the fundamental importance of the work in this sector, activities are not valued by professionals from other sectors of the hospital. This results from several factors: little emphasis on nurse training; work characterized as indirect patient care; similarities to housework, which has been historically devalued in the labor market; indoor environment, isolated from other hospital departments; and staff allocated due to physical or psychological problems, therefore unable to perform direct care activities. Given this situation, many workers who are assigned to work at MSC regard this decision as a punishment, which portrays the stigma carried by the sector.

Concurrent to the professional profile of workers hired/relocated to MSC of HC-UFMG, one may note that this department has working conditions that should be studied and may interfere with work development, such as high temperatures; poor air circulation; noisy equipment; insufficient chairs, so that workers can work in sitting position; and small number of hearing protectors. These working conditions were also found in others MSCs[6] where workers are exposed to physical, chemical, biological, ergonomic, and psychosocial occupational hazards.

In this context, absenteeism is an important issue to be studied at MSCs because high absence rates show problems with the department and the nursing staff. Data regarding absenteeism in MSC of HC-UFMG show rates above those recommended by the Federal Nursing Council (COFEN), which is currently 6%. In 2008, the average rate was 8.52%; in 2009, 11.46%; in 2010, 9.50%; and in 2011, 8.23%, showing a decrease from 2009 onwards, but still above the ideal range[7].

Facing these factors that affect the work process and cause illnesses to workers, besides the lack of an institutional QLW policy, members of the LAGEPE implemented the outreach project "awareness strategies for the promotion of quality of life at work" as a micropolicy at MSC, without losing sight of the issues concerning the institutional macropolicy. In this perspective, we adopted hot footbath therapy as a strategy to break from work and provide relaxation to the nursing team, aiming at reducing daily work stress.

Hot footbath is the practice of resting the feet in a basin of warm water with herbs or aromatized oil to relax and slow down their daily routine, once it can relieve the feeling of feet tiredness and effort. The technique consists of soaking your feet in a basin of hot water for 15 minutes, followed by a 5-minute massage with moisturizing cream or oil. Water is added with some herbs, bath salts, or essences to help reduce stress[7].

The choice of footbath technique is justified by the fact that nursing employees stay for many hours in standing or sitting positions, without moving their legs. It is therefore natural that at the end of the day they feel fatigue on the legs and feet.

However, most people forget basic and simple precautions that can help revitalize the body and allow the relaxation required to replenish energy. Few remember, for example, that the feet are the body support base and by treating them correctly, one can get a feeling of well-being and benefits for the whole body. The feet hold approximately 70,000 nerve endings or spots associated with the various organs of the human body, and pressuring and heating such spots immediately impact on the energy balance of the body[8].

Reflexology has been used for centuries by different cultures, and nowadays it is used to rebalance the body, reduce stress, achieve relaxation, and improve blood circulation through pressure on reflex zones of the feet. This technique is based on the idea and practical perception of tangible points that, when stimulated, boost energy to specific parts of the body related to the functioning of organs, especially the nervous system[8].

This article is aimed at describing and analyzing the use of hot footbaths as a means to promote QLW for the nursing staff of MSC, HC-UFMG, as a micropolicy.

METHOD

This is an experience report with qualitative approach that was carried out with the nursing staff at MSC, HC-UFMG.

The project was initiated in August 2010, and its disclosure has been prepared in the form of an informative text on footbaths, containing information about a workshop for the nursing staff. This workshop aimed to present the project and represented a moment of negotiations with employees as to day and time for the activities, so that all decisions could be made collectively. In parallel, a wall was produced and posted in a location visible to all employees to provide them with all the project information.

Ethical requirements were in accordance with the ethics committee of UFMG, as required by Resolution 466/12 of the National Health Council, with protocol number 481/07, and the signing of the informed consent.

The footbath technique was applied in the nursing room, during working hours, from August to December 2010, in a total of 11 meetings in which the project coordinator and three fellows assisted an average of 18 employees in approximately 20 minutes each, once a week. In addition, two meetings were planned to review the project in October and December 2010. All meetings were recorded in an institutional diary, with detailed account of the events and issues observed during the activities.

The evaluative meetings aimed to identify the perception of employees regarding the QLW project, considering criticism and suggestions, and to raise demands related to their work conditions at MSC, such as air-conditioning installation, number of chairs available, support for feet, noise reduction, and alternation of work scales. At these meetings, the method used for evaluation was open question and time to speak about their perceptions of the project, with speeches recorded and fully transcribed. A total of 27 employees participated in the meetings and responded to the assessment tool.

The technique for verification of responses was content analysis, and data were decoded and categorized according to repetition, being given significance to enable inferences. Thus, we sought to conduct a thorough and critical reading of the data collected to analyze the content of the responses[9]. These were identified by the letter "W," as of worker, followed by a number to preserve confidentiality and anonymity of the subjects.

To organize the data collected, all the written and oral answers were first read for an overview. Second, words and significant excerpts related to subject matter were extracted. These keywords and excerpts were then grouped, with a view to meaning convergence and divergence[9,10]. Organization of the data allowed the identification of two thematic categories to describe and analyze the staff's perception about the QLW project.

RESULTS AND DISCUSSION

In this study, we chose to present the results followed by discussions related to the themes emerging from the workers' speeches.

Caring for people and the environment to take care of each other: the importance of creating moments of break and more comfortable and enjoyable working environments

The workers' responses showed the importance of providing moments of breaks at work to professionals who provide nursing care directly or indirectly to the public. In addition, when workers were cared for by members of the LAGEPE while participating in the footbath technique, they reported feeling valued and the need of more moments of relaxation at MSC to reduce daily stress.

These health-care professionals had a precious time to reflect on their self-care as a requirement to be a caregiver in nursing, that is, a professional who cares for the individual and for the materials necessary in this process.

> The project gave me a moment of rest from our activities, which sometimes leave us stressed and tired; the foot bath technique allowed me to experience a bit of care we should deliver to ourselves because we often care about our tasks and forget to take care of us. (W13)

> […] It is the moment of a person to be in the company of others, a moment of peace, tranquility;

> let us say a moment to clean our souls, simple things [...] I hope that we can always have this moment to take care and think of us. (W02)

> In order to take good care of others, one must take good care of oneself first, and this project is providing us with this self-care. It is a feasible idea that values the worker. (W01)

The relationship between health professionals and the organizational processes should favor their aspirations, respect their subjectivity, and meet their needs because then the work can bring experiences of pleasure and satisfaction. Therefore, it is essential to promote transformative actions so that these professionals can be taken care of and have a positive impact in their quality of life[2], once properly caring for oneself makes one able to relate to and care for other persons.

When a human being performs a mechanized task, without personal care, their needs and desires are denied. For this reason, it is important that caregivers can be supported by someone, so they can carry out their activities smoothly, in a reflective and cautious manner, while optimizing interpersonal relationships at work[11]. Therefore, for professionals to incorporate the function of caregivers, they must be cared for by themselves or by people around them[12].

Institutions should care for their professional caregivers, as the quality of services provided by a particular service is directly linked to the quality of life of employees[13]. Feeling good and rested is, therefore, vital for caregivers to have their biopsychosocial–spiritual demands fulfilled for an effective professional performance.

Therefore, we reaffirm the need for organizations, especially health-care units, to promote breaks at work, using simple strategies such as footbaths that can provide moments of reflection and relaxation.

However, currently health professionals are subjected to a loaded work routine, with high levels of tension involving all team members[11]. Factors such as noises, constant complaints, sadness, deaths, pain, anxiety, high demanding activities, poorly paid work, double shifts to ensure better wages, and failure to consider their biopsychosocial–human–spiritual demands are examples of the everyday life of these workers[13].

Currently, these professionals live in working environments fragmented by specialization, and bureaucratic, mechanistic, ruled routines and requirements that become stressful and painful[2]. The corporate environment, working conditions, and how they impact relationships between people can result in dissatisfaction, exhaustion, anguish, and displeasure, thus triggering physical and mental illnesses[13]. Such disorders not only affect professional tasks but also, in social life, prevent the caregiver from a healthy living.

In this perspective, the reports of the nursing team of HC-UFMG showed the importance of creating comfortable and pleasant work conditions as key to productivity and harmonious interpersonal relationships.

> Due to repetitive and heavy workload in a hot and noisy environment, I experienced footbaths and enjoyed it. It was relaxing and very comforting. I would love to continue. (W08)

> Finally a project focused on the care of the nursing staff, a suffered group, often with adverse working conditions; a break to take care of ourselves, makes all the difference. (W24)

> Participating in the foot bath groups shows the needs of the nursing team to have a more human look over co-workers. I believe ideas like this are likely to contribute to a more decent and less stressful work. (W26)

On the basis of the speeches of workers in this study, it is a must to understand the concept of ambience in health, which has been defined in the Humanization Policy of the Ministry of Health[14] and studied by some authors in recent years[15].

Ambience in health consists of the conditions applied to physical environment, comprising social and professional spaces, as well as interpersonal relations, and should promote welcoming and efficient human attention. Ambience is beyond technical, simple, and usual arrangements of environments, for it describes the situations built and experienced

by a collectivity, with all of its cultural and social characteristics in a given time and space[14].

The concept of ambience primarily covers the union of comfort factors, production of subjectivities, and facilitation of the work process, with privacy of subjects and appreciation of the environmental factors interacting with people (color, morphology, lighting); meeting of the subjects through work and reflection on the work process; favoring of resources; and humane, warm, and decisive treatment[14].

This outreach project, by adopting the footbath strategy, also led the workers of MSC to make a reflection about their working conditions and the need to produce pleasant and comfortable moments like the one experienced with the members of the LAGEPE. These moments led workers to think about the factors intrinsic to the concept of ambience and in micro-actions that can be developed in various fields of work when all the staff is involved, including managers, who should contribute with macropolicy actions.

Footbaths: strategy for awareness and promotion of quality of life at work

This section is intended to present the perceptions, thoughts, and feelings experienced by nursing professionals with the use of footbaths as strategy for awareness and promotion of QLW. The statements raised in meetings showed the workers' satisfaction with their functions and brought benefits both individually and collectively, easing the unfavorable conditions and contributing to the quality of life of professionals.

> Work is part of our human life; it is our means of survival. So we need to work with dignity in order to have dignity. Quality of life is what keeps us in good harmony while promoting health [...], and the footbath technique has favored our quality of life. (W04)

> A project like footbath came to add us something that was missing for our quality of life, because we stay at work the biggest part of our days [...] (W15)

The quality of life is directly related to health and closely related to several factors, including the QLW. Work currently occupies a central place in people's lives and can therefore bring several positive or negative consequences[6]. Therefore, to have quality of life, the employee must be provided with a healthy and harmonious work environment, where the employees themselves perceive the influence of work on their quality of life.

The statements below show how footbaths made the workplace a more harmonious and interactive site, positively interfering with the production of the staff, which feels valued and reports better performance.

> The project was very important for interaction and brought a new atmosphere for the sector. We can say it was a success. I relaxed at these moments and forgot I was in a production line for a while. (W06)

> Very relaxing, also promoting interaction between workers. MSC needs and deserves more projects like this. (W09)

> [...] This project helps us to relax and improve productivity. (W21)

The difficulty of institutions to adhere to programs aimed at improving the QLW is related to the additional expenses generated. However, one should think of the humanization of work and workers, as well as cost-effectiveness, because the more satisfied with their work and healthier, the more productive the professionals become[16].

In addition to some changes in the workplace, reports showed a sense of well-being during the workday, and feelings of recovery, relaxation, and tranquility. These factors help to protect the workers from work-related diseases resulting from occupational exposure to chronic stress, thus reflecting negatively on their lives when it achieves the social, professional, individual, and familial levels.

As a result of work-related illnesses, we identified decrease in productivity and professional quality of life, increased absenteeism and occupational accidents, negative view of the institution by the employee, and so on causing damage to the institution's reputation and reducing the quality of service[17].

Therefore, it is important to study absenteeism, to identify working conditions, and to diagnose diseases related to work environment as early as possible to develop a macropolicy of QLW and to implement micropolicies by using simple strategies similar to the one mentioned in this paper.

The study subjects considered footbath as a strategy that provided pleasant moments and brought a new atmosphere to the sector, contributing to the well-being of all the nursing staff. In their reports, the project described as innovative because one hardly sees activities aimed at QLW in health-care organizations, even though studies show the benefits of such practices.

> This project brought life, transformation and joy to all of us. Nursing professionals always deal with pain and suffering. We never take care of our joy. Starting with the feet was the best way to give us affection. (W16)

> I would like to continue this project, because it is very good for self-esteem. I feel very well, this was the best thing that happened here at MSC recently. (W18)

> I believe that the project is innovative and contributes to professional well-being during our workday. (W05)

Workers of MSC also pointed out the need to expand these moments of breaks and relaxation at work, with techniques such as footbaths, to other sectors and institutions. They also brought about the importance of implementing such projects focused on nursing professionals, who face poor working conditions daily.

> The footbath project [...] is a great initiative and should be adhered to by the other sectors of the institution, for it provides us a moment of relaxation, and makes us reflect on how important it is to take care of ourselves first to then take care of others. (W27)

The establishment and continuation of QLW programs in health services, developed through a number of intervention proposals, will only be feasible when the organizational culture is changed, starting from the awareness and involvement of managers and employees in organizational policies[18].

Thus, this outreach project is expected to become reference for the establishment of an institutional policy to keep providing the necessary incentive for the nursing staff to develop self-care and create work environments with comfort, professional satisfaction, and productivity as a basic premise to provide quality service to the population.

CLOSING COMMENTS

The outreach project "strategies to promote humanization and quality of life at work," through the footbath technique, created moments of relaxation and care for the nursing staff of MSC at HC-UFMG. Results showed that the adoption of such a strategy provided workers with the feeling of well-being and caused them to reflect about self-care.

This experience raised a reflection on the working conditions of nursing professionals at MSC, and their impact in daily work. A question on the importance of QLW was also raised as a startup to an environment favorable to productivity, without neglecting the human condition of the employees, with all of their biopsychosocial–spiritual demands, thus showing the need to develop a dyad work-worker with actions to promote QLW.

In this perspective, it is important to create opportunities for workers to discuss the work processes, macropolicies, and micropolicies of the institution, so there may be pros and cons, as well as suggestions to improve their work and quality of life.

In this process of collective construction, the management teams play a key role in the implementation of quality of life programs, as the appreciation of work reflect significantly in absenteeism rates and quality of service.

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PREOPERATIVE UNIT: A NEW PROPOSAL FOR SERVICES AND MANAGEMENT

Unidade pré-operatória: uma nova proposta de atendimento e gestão

Unidad de preparación quirúrgica: una nueva propuesta de servicios y gestión

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ABSTRACT: Objective: To present the results of the implementation process of a preoperative unit. **Method:** Descriptive and analytical study including experience report, with the goal of reporting the implementation of a preoperative unit in a private general hospital in the city of São Paulo, as well as the experience of the professionals involved. **Results:** The efficiency of a preoperative unit was confirmed as an optimization strategy for the surgical center, whose processes are established with agility by a team focused on this type of patient. **Conclusion:** The preoperative unit was established as an opportunity to minimize the lack of beds, to centralize services to streamline them, and to promote greater integration and continuity of preoperative care to the assistance proposed by the surgical center, as well as a better organization of administrative and health-care activities**.**

KEYWORDS: Preoperative Care. Perioperative Nursing. Health Services Administration.

RESUMO: Objetivo: Apresentar os resultados do processo da implantação de uma Unidade Pré-operatória. **Método:** Estudo descritivo e analítico tipo relato de experiência, tendo como meta o relato da implantação de uma unidade pré-operatória em um hospital geral privado, localizado no município de São Paulo, e da experiência dos profissionais envolvidos. **Resultados:** Constatou-se a eficiência de uma unidade pré-operatória como estratégia de otimização do centro cirúrgico, estabelecendo os processos com agilidade por uma equipe com olhar focado neste tipo de paciente. **Conclusão:** A Unidade Pré-operatória foi implantada como uma oportunidade de minimização da falta de leitos, visando centralizar serviços de forma a agilizá-lo,com o objetivo de promover maior integração e continuidade dos cuidados pré-operatórios à assistência proposta pelo Centro Cirúrgico, além de melhor organização das atividades administrativas e assistenciais.

PALAVRAS-CHAVE: Cuidados pré-operatórios. Enfermagem perioperatória. Administração de serviços de saúde.

RESUMEN: Objetivo: Presentar los resultados del proceso de la implementación de una unidad de preparación quirúrgica. **Método:** Estudio descriptivo y analítico incluyendo relato de experiencia, con el objetivo de orientar la implementación de una unidad de preparación quirúrgica en un hospital general privado en la ciudad de São Paulo y relatar la experiencia de los profesionales involucrados. **Resultados**: La eficiencia de una unidad de preparación quirúrgica como estrategia de optimización del centro quirúrgico y el establecimiento de procesos agiles conducidos por un equipo enfocado en el paciente quirúrgico. **Conclusión**: La unidad de preparación quirúrgica se estableció como una oportunidad para reducir al mínimo la indisponibilidad de camas, para centralizar los servicios de manera ágil con el fin de promover una mayor integración y continuidad de la asistencia para el cuidado preoperatorio propuesto por el Centro Quirúrgico y una mejor organización de las actividades administrativas y asistenciales.

PALABRAS CLAVE: Cuidados Preoperatorios. Enfermería Perioperatoria. Administración de los Servicios de la Salud.

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INTRODUCTION

Recently, much has been studied about processes focused on quality and efficiency. In hospital management, one of the greatest challenges is providing service for an increasing number of patients, taking into consideration the insufficient number of available beds and humanization aspects. Hospital organizations are among the ones with the most complex management, not only due to the nobility and amplitude of their work but especially due to inclusion of a multidisciplinary team to provide health support in preventive, curative, and rehabilitating characters. It is also an environment to teach and learn and to develop scientific production[1].

In addition to this rationale, there are also production and costs, that is, the business sustainability. Offering a proposal with real value for the client is part of a business strategy and is an item in the service system[2]. The continuous search by the institutions for improvement of their services has been the differential for their permanence and for standing out in the market where they operate. Satisfying needs or even overcoming them is fundamental because client's satisfaction becomes an essential factor for the survival of companies, especially services companies whose products are characterized by intangibility[3].

A study that assessed hospital and ambulatory service offer and production in public and private hospitals found in 2009 a deficit of 22,216 hospital beds in Brazil. With regard to the number of surgical hospitalizations, 23.2% increase was observed, which is in agreement with the 16.8% population growth, even though 18.4% decrease in the number of beds was observed[4]. Therefore, managing beds with efficacy became urgent in hospital life, especially considering the turnover dynamics in surgical hospitalizations and possible complications. To this fact, we can add the excellence in providing services, a riveting and recent concern.

Another element directly associated with the dynamics of bed management and service offer is surgical movement, which is considered a variable that interferes in quality and productivity indicators of hospital institutions. The following are included as parameters of productivity evaluation in the surgery room: occupation rate, permanence time, anesthesia recovery, time interval between surgeries, delay time, and surgery suspension[5].

Good performance measurement of a surgical center (SC) is directly associated with quality of its own processes and as a consequence with the services that support it, a combination between physical, technological installations, and appropriate equipment used by a qualified, trained, and competent staff[6].

Thus, the idea of hospital bed optimization emerged in our institution. In May 2012, a preoperative unit was structured with the aim of integrating service of the surgical hospitalization unit to the preexistent routines of the SC through centralizing the control in this team and optimizing not only the hospital beds but also the preoperative preparation processes.

The strategy used to optimize the preoperative unit processes was developed from the service routine of anesthesia recovery. This unit receives the patient after a surgical procedure, where he/she should remain until he/she recovers full awareness and have stable vital signs, always under observation and constant care of the SC nursing team. This staff should prevent intercurrences from the postanesthesia period and/or, if they may happen, provide the patient with the appropriate treatment[7].

In our institution, this unit can accommodate patients on transportation stretchers, and curtains separate the beds. It has a minimum stock of disposable materials and medications for the immediate postoperatory service, with support of the satellite drug store, located inside the SC. The preoperative unit has physical, material, technological, and human resources similar to those of the anesthesia recovery; however, they are directed for patient's service in the preoperative phase. Materials/medications are requested through Personal Digital Assistant, which allows immediate drug management without the need of request and delivery of requested medication to the central drug store.

Because it is a small unit with simple accommodation, the nurse developed a strategy for choosing patients for admission. The established criteria include adult patients without motor deficit, in elective surgery without colon preparation, and with hospitalization on the surgery date.

On the eve of the scheduled date of surgery, the program is checked and those patients listed in the program are chosen for acceptance in the preoperative unit according to the selection criteria predetermined by the unit. After the selection, the nurse plans nursing support in the preoperative period. This planning consists of signalizing the actions that should be done with the patients according to the proposed surgery, and information in the request for hospitalization/surgery, followed by the surgeon's medical practice.

The nursing service prescription is structured focusing on the surgical preparation. Therefore, at hospitalization day, it may be possible that the nursing technician begins patient's care as soon as he/she arrives in the unit.

All printed papers are verified as soon as the medical record is delivered to the management assistant, who is oriented in the event to signalize any abeyances or disagreements from what is preconized by the institution. The required documents are the following: free informed consent for the surgery; hospitalization/surgery request, with all the information regarding the surgical scheduling; patient's identification; diagnosis; examinations that led to such diagnosis; preoperative prescription; date and time of surgery; and surgical time and necessary materials for the intra-operative period. Besides the verification of documents, heart and laboratory examinations, preanesthesia evaluation form, and anesthesia informed consent are separated in a writing board to facilitate the anesthesiologist's visit. Nursing evaluation and planning are also in writing boards to avoid the manipulation of medical records by several professionals in short period.

This dynamic has been more effective. Focus of the team at preoperative preparation ensures caution verification, which favors the accomplishment of all stages: nursing preoperative evaluation; preanesthetic visit; vital signs verification; trichotomy and asepsis of the surgical area; blood sample swab for blood group system and lab examinations; electrocardiogram; verification of documents required by the institution for patient's follow-up until the SC; marker of surgery area (laterality) when applicable; and emotional comfort through humanized service, valuing the differences and particularities of every subject, favoring anxiety and stress decrease in the preoperative stage.

The mark of surgery area (laterality) aims at identifying, with no ambiguities, the place of the surgical procedure. For procedures that involve the difference between bilateral structures (right and left), multiple structures (such as fingers and toes) or multiple levels (such as in spine procedures), the place must be marked in a way that the mark is visible after the patient has been prepared[8]. This study aimed at presenting results of the implementation process of a preoperative unit.

METHOD

This descriptive and analytical study aimed at implementing a preoperative unit. It was a report experience of professionals from a private and philanthropic general hospital, in the city of São Paulo, Brazil.

Delay to begin surgeries impacts all the planning of surgical and dynamic schedule in an SC. Distance between the SC and hospitalization unities and accessibility to elevators are factors that lead to these delays. Closeness to the SC was a determinant factor to implement the preoperative unit in such area, which is located on the same floor as the SC as a neighbor unit. The unit has eight beds with transportation stretcher and separation through curtains, which is similar to the aspect of unities of anesthesia recovery or emergency rooms. It has a bathroom for the patients from these beds and independent rooms with four small suites, composed of beds with stretchers and an exclusive bathroom with shower, separated through drywalls — an edification of lighter and thinner plaster walls than masonry walls —, and a sliding door.

From the physical characteristics of the unit, it would not be possible to meet all the service demands in the surgical program completely, with the need of choosing patients who may be treated in the area with no damage to preoperative nursing assistance. For example, because there are four suites with shower, criteria are required for choosing patients who need trichotomy and bath at the same time as surgery. Thus, we thought about making patient's selection based on the characteristics of the surgery with regard to the physical plan and profile of the unit for a faster dynamics. The best moment would be the day before the surgical program.

In this unit, patients are present only in the preoperative period, not at postoperative period. This is different from the day clinic sector, or day hospital, seen in other institutions. Thus, a nurse from the unit was chosen to perform the patient's selection to the bed control sector, based on the following criteria: patients who do not need to be hospitalized on the eve of surgery; surgical procedures with no intestinal preparation; adult patients; and patients with no mobility deficit. The amount of available beds and their turnover, that is, time when the bed would be free and clean again for another patient's acceptance, focusing on the surgical program, was also taken into consideration.

For an appropriate performance of the preoperative preparation, in this unit, the following procedures were carried out: multidisciplinary evaluation, lab examinations, electrocardiogram, trichotomy, hygiene, and asepsis of the surgery area; bath with chlorhexidine is recommended for abdominal

surgeries or those of large bones. If the nurse finds it necessary, he/she can bathe the patient, taking into consideration each patient's individuality and rules by the Commission of Hospital Infection Control of the institution.

The nurse orients patients and their companions about the service provided and the continuity of service until anesthesia recovery. Another relevant aspect is the optimization of specific materials that can be reduced due to use minimization. After anesthesia recovery discharge, the patient and his/her companion are taken to an apartment. During stay in the preoperative unit, patient's belongings are locked in a closet. The *concierge* is the professional who talks to relatives and companions while the patient is in the SC.

To keep process agility, we chose nursing professionals with great knowledge and experience in the area. Need of acquaintance with the surgical procedure and with the orientations for this preparation resulted in the selection of an assistance team that is mainly composed by professionals from the SC, as well as the nursing coordination.

Professionals remained wearing privative clothing to keep the characteristic of a restricted unit, and the nearness to the SC facilitates the transition from the unities if necessary. After the beginning of the activities in such sector, professionals started performing support activities only in the preoperative unit.

To evaluate process management, we chose indicators for measuring the results of the unit, considering the unit acceptance flow, surgeries indicated without delay, and demarcation of laterality or mark of the surgery area.

Because this is a private institution, an intervention was necessary together with the surgeons, which was done through an invitation to be aware of the unit proposal and of its facilities, besides explanation of the working process, inviting them to release their patients' acceptance.

For this study, we also wanted to measure the perception of physical clients about the unit. To do so, the researcher developed an instrument with the following items: hospitalization logistics; focused service; preparation time agility; and deficiency in accommodations. The creation of a unit was based on American and European services, which consist of accommodating patients in the preoperative unit in a place next to the surgery block, with support from the SC team that has specialized technical knowledge about the preparation and turnover of patients. Every item presented multiple-choice answers and, in the end, there was a space for commentaries (Appendix 1).

This instrument was validated through an interdisciplinary discussion with professionals from the areas of service and surgeries superintendence, anesthesiologists, surgeries, and nursing team from the SC.

The evaluation period comprised October to November 2012. A letter explaining the objective of fulfilling the research instrument, with no commitment, was provided to each medical professional who was cared in the unit. For those who wished to answer, the instrument was delivered as a service satisfaction research. The answered instruments were put in an envelope and analyzed in future time.

RESULTS

After 6 months of the unit implementation, we observed an increase of surgeon's interest for their patients' acceptance. This reflects on the achievement of primary objectives of the unit installation, optimization of hospital beds, and process of surgical patient assistance though the focused care.

As to the applied instrument, 33 clients from different medical categories (Figure 1) were consulted, who answered about the preoperative unit. We observed that 100% mentioned that the unit significantly contributed for the work plan due to the agility in the patient's preparation to be followed to the SC.

In Table 1 we present the percentages of answers to the instrument applied to medical teams. An improvement was also observed in the decrease of time associated with hospitalization logistics for 97% professional respondents because the patient is taken to the bed where there is a focused service in the surgical patient's preparation. For 91% of them, the unit has brought a significant improvement for the client, which is associated with process agility. Of the interviewed subjects, 61% answered that the unit totally overcomes the lack of accommodations, even though there is still a need for improvements; on the other hand, 85% said this area implementation following American and European models was a right decision from the hospital director.

The medical team's satisfaction toward the unit has been observed in reports about the perception of the unit and the developed service. Here are some of the statements written in the space to commentaries in the evaluation instrument:

> Since there are beds exclusively to the preoperative period, we do not need to book a room, which

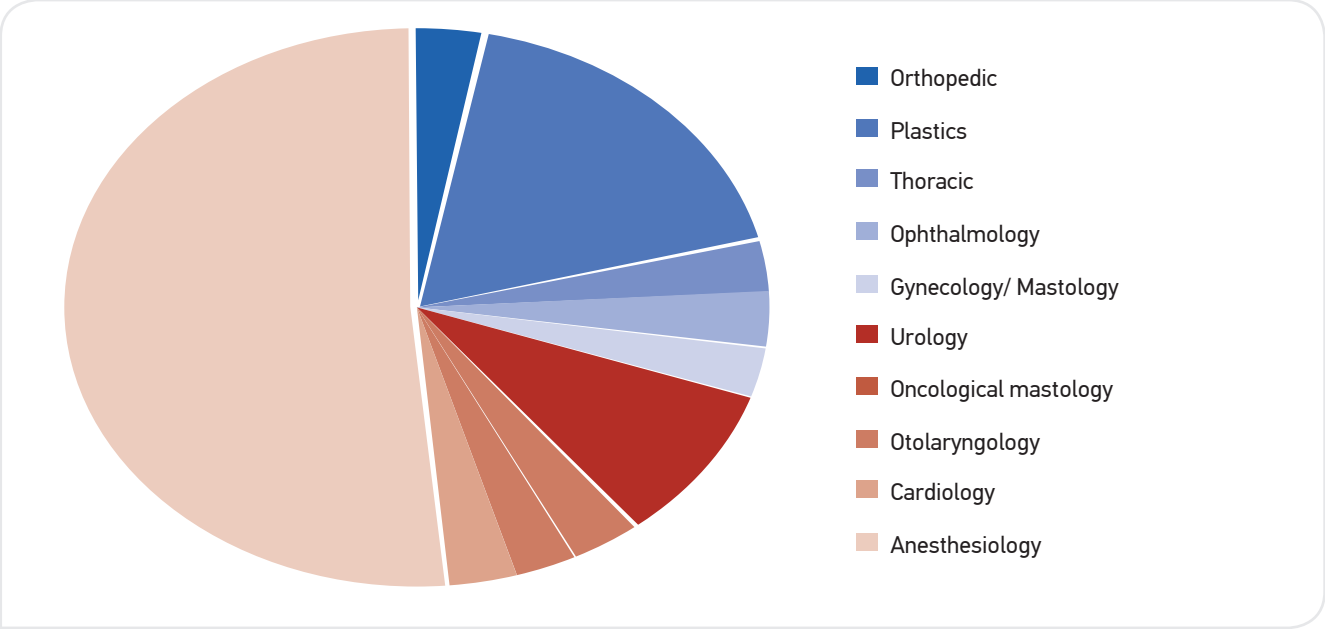

Figure 1. Distribution of medical specialties that answered to the research instrument, São Paulo-SP, Brazil, 2012.

> can take a long time if the hospital is full. Nursing is faster because it is focused on surgical preparation. Before this, preoperative period took more than twice the time spent. Now, with the new unit, the process is much faster. The patients and relatives' great anxiety is towards the procedure, so they prefer to make such process faster. (S1)

> There has been great improvement in logistics, making preoperative scheduling much easier and decreasing arrival time of the patient in the SC... It is the only visit in great hospitals in São Paulo and contributes to decreasing hospitalization time, and the delay in the beginning of surgical procedures has also decreased. (S3)

With regard to the division of the unit as to the physical floor plan and accommodation, absence of a private bathroom for the eight beds was reported as a point to be improved, as seen in the following comment:

> Personal care overcomes the physical space. Lack of a private bathroom is important. (S2)

However, another perspective reports that it does not compromise the service.

Table 1. Percentage of answers of the applied instrument, São Paulo-SP, Brazil, 2012.

Variables	n	%
Hospitalization logistics		
Improvement in time reduction	32	97
Nonsignificant change in this process	1	3
Change damaged the process	–	0
Focused service		
There was a significant improvement for the client	30	91
It kept the same results obtained in the IU	3	9
There was no improvement	–	0
Preparation time agility		
It significantly contributes for the working plan	33	100
It did not change the routine	–	0
Deficiency in accommodations		
Agility in the process totally overcomes this deficiency	20	61
It partially overcomes	12	36
It does not overcome because it brings unpleasantness to clients	1	3
Unit following American and European services		
It was a correct decision from the institution director	28	85
It was not a correct decision, because it caused a negative impact in the clients' perception	–	0
It was a correct management decision, but accommodations must be improved	5	15

> Accommodations are good; they do not compromise the process efficiency. (S3)

As a suggestion, the previous presentation of the unit standouts.

> In order to avoid the negative impact of the accommodation, there should be a previous explanation for the patient about the unit pit stop, giving emphasis to its profile and objectives, mentioning especially that this is a sector integrated to the SC. (S1)

With regard to the evaluated indicators, a reduction was observed in the delays to being surgeries (Figure 2). Nearness with the SC facilitated the search for the patient and the preoperative contact with the team members.

Nearness and knowledge of professionals from the SC brought to the unit demarcation of laterality (Figure 3) and correct fulfillment of the needed forms.

In January 2012, the occupation rate was 84%; in February 87%; in March 90.3%; and in April 88.8%. After the unit opening in May 2012, higher values were observed with the following percentages: May, 91.7%; June, 93.1%; July, 91.6%; August, 89%; September, 91.3%; October, 91%; November, 87%; and December, 87.3%.

DISCUSSION

Results from this study showed the efficiency of a preoperative unit as a strategy of SC optimization by establishing the processes with agility using a team focused on such patients.

In a study carried out in 2003, in Arizona, the USA, the multidisciplinary team of a hospital was gathered with the aim of proposing strategies to decrease the preparation time of surgical patients that they were ready 30 minutes before the time of surgery. The preoperative area was prepared with this purpose and the dynamic processes were determined, besides the team's preparation. Ninety-eight patients were followed and as a result the researchers obtained a 7% decrease in delays to prepare patients, which was not considered very significant. However, the research allowed recognizing that the possibility of fast, efficient, and safe service may also be developed in health institutions[9].

In an attempt to dialogue with the mentioned experience, besides proposing efficient and dynamic processes, making patient's preparation and follow-up to the SC faster and avoiding delays in the beginning of the procedure, we tried to meet all the requirements of the quality insurance Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and to know the doctor client's impressions.

In 2004, JCAHO implanted the Universal Protocol, which includes the following elements: preoperative verification, surgical area marker, and timeout process at intraoperative period[10]. Time out is a pause that consists of a fundamental stage performed in a surgical room before the beginning of the procedure, and it aims at evaluating and ensuring that the patient, surgical place, procedure, and positioning are correct and all documents, equipment, and information are available. In this stage, all conference processes are done orally,

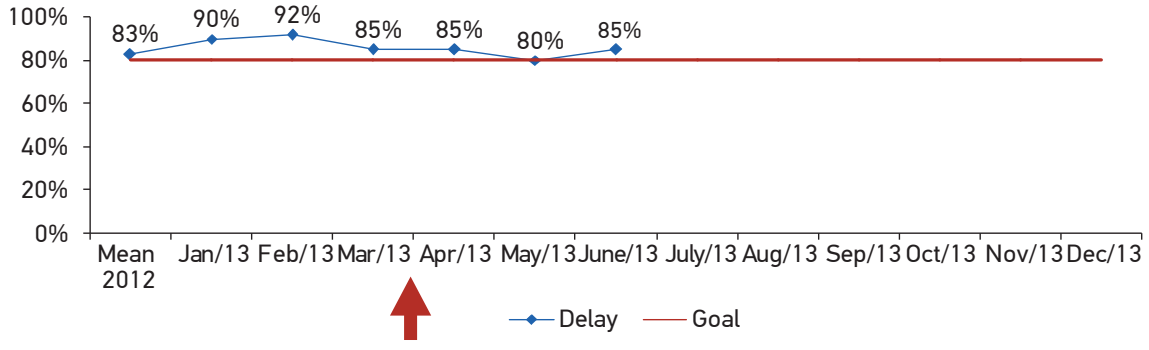

Figure 2. Indicator of number of surgeries beginning with no delay, São Paulo-SP, Brazil, 2013.

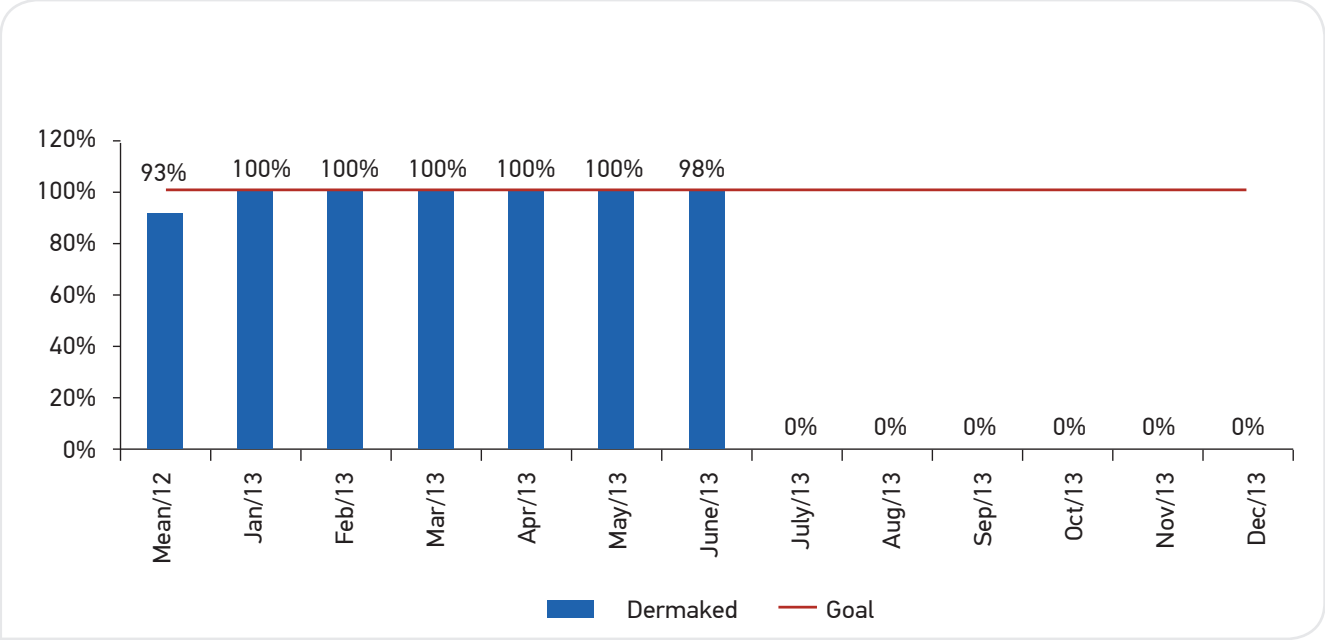

Figure 3. Indicator of surgical laterality marker, São Paulo-SP, Brazil, 2013.

in loud voice, and with the participation of all the members of the surgical team. It is also required the interruption of all and any activity in the room. Reading of items is integrally and exactly as written in the patient's medical record[8].

The first step of JCAHO Universal Protocol, the preoperative verification, aims at ensuring that all relevant documents and information and equipment are available before the beginning of the procedure, with correct identification and labeled according to the patient's identification register and consistent with the patient's expectations and with team's comprehension regarding the patient, procedure, and place of surgery. Lack of information or discrepancies must be approached and solved before the beginning of the surgical procedure[8,11].

Due to the nearness with the SC (on the same floor), it was easier to mark the laterality by the medical professional and the completion of all required documents. Furthermore, the SC also adds gains to the new model, given the higher control of operationalization of surgery plan through the decrease in delays and higher facility of rescheduling, when necessary.

In the results from this study, laterality marker reached 100% levels, and excellence in care regarding goal 1 of safe surgery from the World Health Organization (correct identification of the patient and surgical place). These levels could not be achieved in other studies: in one at Porto Alegre (RS, Brazil), 81.5% professionals adhered to the first laterality marker, and 15.3% to the second one[12].

As to surgery delay, the new unit allowed that the indicators were kept within the predetermined goal of above 80%. In another study, surgery delay was the main justification seen in surgical suspensions[13], with 28 reports (60.90%). The surgery suspension is known to result in a substantial loss of financial return to the SC because it demands inactive hour of the operation room and of the collaborator, reducing therefore the financial return.

Another evident fact seen in this study was the high rate of hospital occupation indices, evidenced by the percentages measured in the months after the preoperative unit opening. Until the opening of this unit, beds — that were scheduled in the day before surgeries — were available, which improved patient's distribution and avoided inactivity of the apartments because many times the postsurgical destinations of the patients are changed due to the need of another kind of unit. This is a new concept of patient's care, taking into consideration more efficient processes and resource optimization, not forgetting about the attention and "human heat" in the service.

FINAL CONSIDERATIONS

The preoperative unit was implemented as an opportunity of decreasing the scarcity of beds, aiming at centralizing

services to make them faster and to promote more integration and continuity of preoperative care to the service proposed by the SC unit. Thus, we understand that results, until now, have been very relevant to the institution and provide a better advance in the management and assistance activities.

This stimulate us, in an expansion period, to plan a physical structure that may provide more comfort to our clients and their companions or relatives, besides the increase of scientific knowledge associated with technical qualification and a positive attitude, which ensure service quality and professional competence.

Therefore, we will continue searching for resources to reach our goals. We believe that these results may be used as an encouragement for other institutions to seek improvement in their services development.

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ANEXO 1 – INSTRUMENTO DE COLETA DE DADOS

SUPERINTENDÊNCIA DE ATENDIMENTO E OPERAÇÕES

UNIDADE PRÉ-OPERATÓRIA

Enfª Daniela Magalhães Bispo

A Unidade Pré-operatória foi estruturada para integrar o preparo dos pacientes cirúrgicos ao ambiente e rotinas já vigentes ao Centro Cirúrgico, centralizando o controle a esta equipe. Assim, os pacientes que não necessitam internação na véspera da cirurgia são admitidos nesta Unidade, onde é realizada a avaliação multidisciplinar, exames, tricotomia, higienização e antissepsia, além de receber todas as informações necessárias junto a um acompanhante, agilizando, assim, a sua chegada à sala operatória.

O intuito deste questionário é saber a opinião dos senhores sobre a unidade e os benefícios proporcionados, bem como receber sugestões para futuras melhorias.

INSTRUMENTO DE COLETA DE DADOS

ESPECIALIDADE MÉDICA:_____

1. Referente à logística da internação até a chegada do cliente à Unidade Pré-operatória *versus* unidade de internação (apartamento). Você considera que ocorreu:

( ) melhoria em redução de tempo

( ) a mudança neste processo não foi significativa

( ) a mudança prejudicou o processo

Comentários:_____

2. Referente ao atendimento focado prestado ao paciente nesta unidade, como: avaliação de enfermagem, avaliação anestésica, tricotomia, antissepsia, proximidade ao CC, marcação da lateralidade, marcação para cirurgia plástica, preenchimento dos impressos necessários. Você considera que:

( ) Houve melhoria significativa para o seu cliente

( ) Manteve os mesmos resultados obtidos nas unidades de Internação

( ) Não houve melhoria

Comentários:_____

3. A Unidade Pré-operatória mediu os tempos de preparo e os avaliou até o momento do "paciente pronto para o CC", com tempo médio de 30' e mediana de 10' à 40'.Você considera que esta agilidade:

( ) Contribuiu significativamente para o seu plano de trabalho

( ) Não alterou sua rotina

Comentários:_____

4. Reconhecendo o padrão de excelência dos nossos clientes, a Unidade Pré-operatória foi criada com o objetivo de agilizar o processo. No entanto, temos a convicção de que melhorias nas acomodações são necessárias. Você considera que:

( ) A agilidade no processo compensa totalmente esta deficiência

( ) Compensa parcialmente

( ) Não compensa, pois traz dissabores aos seus clientes

Comentário:_____

5. Em relação à implantação da Unidade Pré-operatória ter sido baseada em serviços americanos e europeus, que buscam eficiência no processo, você considera que:

( ) Foi uma decisão acertada da direção da instituição, a implantação desta área

( ) Não foi uma decisão acertada, pois impactou negativamente na percepção dos clientes

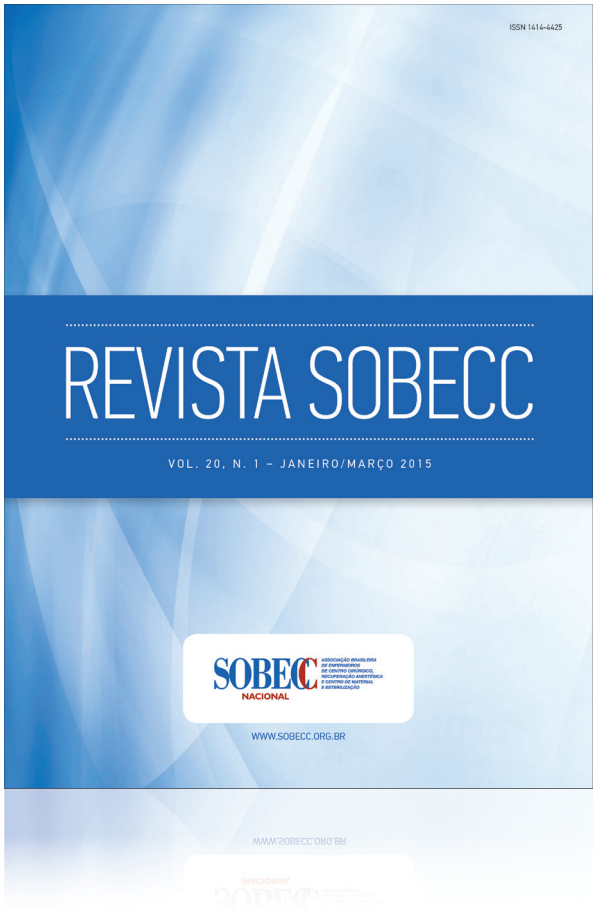
( ) Foi uma decisão administrativa correta, mas as acomodações devem melhorar

Comentários:_____

SUGESTÕES: _____

_____

_____



This issue of **SOBECC** launches its phase of internationalization 18 years after the first number was released. From now on, SOBECC will be available on-line, in Portuguese and in English, being printed in Portuguese; the latter, only for subscribers. We maintained the free publication fees, including in English, to stimulate researchers to publish the result of their studies with us.

You will see that the journal's layout has been changed to keep up with the new phase. The graphic project aimed at providing a lighter and less tiresome reading.

We invite you to participate in this new phase by sending manuscripts for publication, therefore strengthening the scientific communication of Brazilian Perioperative Nursing and publicizing your research nationally and internationally.

Enjoy your reading!

Prof. Eliane da Silva Grazziano, Ph.D.
Editor