RESEARCH

EXPERIENCES OF NURSING PROFESSIONALS ON ENVIRONMENTAL RISKS IN A CENTRAL STERILE SERVICES DEPARTMENT

VIVÊNCIAS DE PROFISSIONAIS DE ENFERMAGEM SOBRE RISCOS AMBIENTAIS EM UM CENTRO DE MATERIAL E ESTERILIZAÇÃO

EXPERIENCIAS DE PROFESIONALES DE ENFERMERÍA EN RIESGOS AMBIENTALES EN UNA CENTRAL DE MATERIALES Y ESTERILIZACIÓN HOSPITALARIA

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Submitted on: 2015/06/17 Approved on: 2015/10/26

ABSTRACT

This qualitative study aimed at identifying the experiences of nursing professionals on exposure to environmental risks in a central sterile services department. Data was collected between February and April 2011 using the focus group method with 12 nursing professionals. Data was analysed according to Minayo's theories. Analysis resulted in two categories: environment of central sterile service department and its interface with other departments; work processes of central sterile service department. The article discusses the performance of nursing professionals considering the environment and physical space of said department, its interfaces with other hospital departments, management, structure influencing work processes, as well as actions that promote health and safety at work, relating them to the worker's health and the environmental risks present at the unit.

Keywords: Nursing; Nursing Staff; Sterilization; Environmental Risks; Occupational Health.

RESUMO

Estudo qualitativo que buscou vivências de profissionais de enfermagem acerca da exposição aos riscos ambientais em um centro de materiais e esterilização hospitalar. A coleta das informações deu-se entre fevereiro e abril de 2011, com 12 profissionais de enfermagem, mediante a realização de Grupo Focal. As informações foram submetidas à análise temática inspirada em Minayo. Do corpus da análise resultaram duas categorias: ambiência e interfaces do Centro de Materiais e Esterilização com os demais setores do hospital, processos de trabalho do referido Centro. O artigo discute a atuação dos profissionais de enfermagem em consideração à ambiência e espaço físico do Centro de Materiais e Esterilização, interfaces com os setores do hospital, gestão, condições estruturais que influenciam os processos de trabalho, medidas promotoras da saúde e segurança no trabalho, relacionando-os à saúde do trabalhador e aos riscos ambientais presentes.

Palavras-chave: *Enfermagem; Recursos Humanos de Enfermagem; Esterilização; Riscos Ambientais; Saúde do Trabalhador.*

RESUMEN

Estudio cualitativo de la experiencia profesional de enfermeros en exposición a riesgos ambientales en una central de materiales y esterilización hospitalaria. La recogida de datos se llevó a cabo entre febrero y abril de 2011, con 12 profesionales de enfermería, mediante la realización de grupos focales. La información recogida fue sometida al análisis temático en base a la teoría de Minayo y resultó en dos categorías: medio ambiente e interfaces de la central de materiales y esterilización hospitalaria con otros sectores del hospital, procesos de trabajo de la mencionada central. El artículo analiza el papel de los profesionales de enfermería en el ambiente y el espacio de la central, interfaces con los sectores del hospital, la gestión, las condiciones estructurales que influyen en los procesos de trabajo, las medidas para promover la salud y la seguridad en el trabajo, relacionándolos con la salud del trabajador y los riesgos ambientales presentes.

Palabras clave*: Enfermería; Personal de Enfermería; Esterilización; Riesgos Ambientales; Salud Laboral.*

INTRODUCTION

Knowledge of environmental risks and the prevention of accidents and illnesses related to work in a central sterile services department (CSSD) is vital given the latter's unique characteristics. Professionals are constantly exposed to risks arising from direct patient care and from handling medical equipment.[1] Brazilian nurse regulations aim at the professionals' protection and the promotion of a safe work environment.[2]

The CSSD is a support unit to all care and diagnostic services. It requires adequately prepared professionals to meet technological and procedural demands.[3] The CSSD is responsible for the cleaning, disinfection and sterilization of hospital materials and it is essential to the prevention and control of hospital infections.

In this context, the processing of hospital materials and instruments should be based on the knowledge and the analysis of the risks along with a physical space that allows a safe flow of people and goods. This process requires the nurses' knowledge of every stage, from equipment reception to their distribution for hospital use.

Physical, chemical and biological agents can be a source of environmental risks in a CSSD and depending on its nature, concentration, intensity and exposure period are likely to damage nursing professionals' health.[2] Other hazards are related to ergonomic (work organization, furniture, equipment, lifting, transport and unloading of materials), and psychosocial (conflicting relationships, shift work, monotony or intense pace of work) risks. Exposure to such risks may cause occupational illnesses and accidents.[2-4]

The complexity of a CSSD environment is due to its operating dynamics: the nursing professionals are routinely exposed to body fluids, heat and chemicals used in cleaning, disinfection and sterilization processes. This study aims at identifying their experiences on their exposure to the environmental hazards of that unit.

METHODOLOGY

This is a qualitative research.[5] The field study was the CSSD of a private medium sized hospital in the northwest of Rio Grande do Sul. The National Health Surveillance Agency through Collegiate Board Resolution No. 15 from 15 March 2012 classified the unit as CSSD II[6] class. The hospital has 115 beds for hospitalization and performs, on average, 400 surgeries per month. Its CSSD sterilizes around 18,100 packets a month for local admissions and surgical procedures.

The ten nursing professionals (nine nursing technicians and one registered nurse) that make up the hospital CSSD accepted to participate in the study. There was no sample loss. Data was collected between February and April 2011 using focal group method[5] which allowed the nursing team to discuss their daily working experiences.

The groups held three two-hour meetings that were recorded and transcribed in full. The programme of the meetings was as follows: first meeting: presentation of the generator theme *What is it for you to work at the CSSD?*; second meeting: work processes; third meeting: discussion on the occupational health hazards faced by nursing professionals. The warm-up favoured the exchange of ideas and group dynamics. It was followed by synthesis and closure. The meetings were held in a room previously scheduled in order to provide comfort and privacy for the group. The group was arranged so that participants were in the field of vision of the researcher and of each other, thereby promoting participation and group interaction.

The collected data was analysed through thematic analysis[5], a critical analytical process that searched for the connections between empirical experience and group relations. The analytical method comprised the following stages: 1) pre-analysis after data transcription and organization; 2) data classification. Further analysis enabled the researchers to retrace and refine classification and identify two thematic categories: CSSD environment and its interface with other hospital units; and CSSD work processes.

The research followed Resolution 466/12[7] recommendations regarding guidelines and standards for research involving human subjects. The study was approved by the Ethics Committee of the Federal University of Rio Grande do Sul (UFRGS) under Protocol No 17448/2011. All participants signed the two copies of the term of free and informed consent.

RESULTS

In order to ensure the confidentiality of the information given by the participants they were identified as Participant 1 (P1), Participant 2 (P2), and so forth. Data analysis resulted in two main themes: CSSD environment and its interface with other hospital units; and CSSD work processes.

CSSD ENVIRONMENT AND INTERFACES WITH THE OTHER HOSPITAL SECTORS

Nursing professionals characterize the CSSD as a service provider unit that combine processes and sub-processes with cleaning, chemical disinfection, linen room, steam sterilization and storage. They demonstrated to be confident about the significance of their role and were aware that improperly processed items are a source of contamination.

The following potential risks of accidents were mentioned:

Here, in the cleaning area, we receive items from different units, from the surgical centre and they are infected [...] (P8).

Sometimes we get needle sticks and sharps amongst tweezers, it is risky [...] (P1).

Regarding the structural conditions that influence work processes, high noise levels in the CSSD are constant. Noise comes from the autoclaves, the sealing machines, and the bang of surgical instruments which interferes with the work of professionals and hinders work processes.

Bells ring very loudly and very often (P2).

We work with a constant noise coming from the autoclaves [...] (P5).

In case of loud noise, the staff use hearing protector devices which significantly reduce the noise. They are therefore unable to hear the bells of the booths, which hinders the functioning of the department.

Storage and delivery of sterilized materials are potentially hazardous given the constant flow of people and environmental contamination. Physical exhaustion and shelving of items were mentioned by two participants.

[...] We go up and down the stairs several times a day carrying equipment to be stored or delivered [...] (P1).

[...] many materials are heavy and over time this can be harmful [...] (P7).

Nursing professionals are frequently in charge of various and simultaneous tasks and subject to inattention and carelessness while on duty in the CSSD.

Although there is a protocol for the identification of equipment used in patients with communicable diseases and in isolation, it is necessary to exercise caution when receiving the material:

[...] I don't know whether the materials I receive are contaminated; I don't know what they were used for, whether they were dressings of a clean or contaminated wound. We need to be extra careful (P1).

Communication is essential for the proper running of a CSSD. According to the nursing professionals, all protocols and different instruments for each medical specialty require constant vigilance and agility to maintain high levels of quality and safety.

CSSD WORK PROCESSES

The participants mention processes not only dealing with working conditions and nursing professionals features but also with how the work is organized and managed.

The CSSD management is the nurses' responsibility and it is a bridge between the hospital management and the nursing team for the exchange of information on safety at work aimed at complying with current legislation, implementing preventive measures and recognising the role of nurses.

During the focal group meetings researchers observed that professionals share their daily work processes with the management. Adherence or not to universal precautions or even unhealthy environmental conditions are pointed out:

[...] The nurse is very attentive to our problems. She knows what every one of us does; she knows whether this is a good team or not (P4).

In the expertise of nursing professionals lays the possibility to change work processes. Cleaning requires attention because various situations are potentially risky. Even professionals who have never had an accident or have never become ill are concerned about being exposed to the risks inherent to the cleaning process.

We need to wear protective goggles, long-barrelled gloves, mask, cap and waterproof apron (P3).

Chemical exposure levels vary according to the products used for the cleaning, chemical disinfection and sterilization of instruments and the regular use of peracetic acid and enzymatic detergents.

[...] Working in CSSD means handling chemicals for instrument cleaning, as we here use the enzymatic one [...] (P7).

The smell of peracetic acid is very strong [...] I wear two disposable masks at work. In case it splashes onto the skin we have to wash it quickly with water (P4).

Regarding the sterilization of instruments, the participants reported that the CSSD has two steam autoclaves with different programming cycles. The autoclaves have two doors, one in the sterilization area and another one in the storage area. Professionals demonstrated to be aware of the need for self-protection.

It all depends on how we deal with the space we have (P7).

[...] We need to take better care of our bodies [...] (P1).

Another risk reported was exposure to the autoclave high temperatures. In addition to the autoclaves themselves, the pipeline remains hot and it does not offer the nurses any protection.

> *Not only the autoclaves are hot, but the pipeline is as well. I can burn myself handling them and I can also bump into them. It already happened (P8).*

The heat in the sterilization and inventory is mitigated by powerful exhaust fans and air conditioners with filtration system. All this combined make for a clean and comfortable environment.

> *The air conditioning should be cleaned frequently because the filters and the external part gather dirt (P3).*

Working at a CSSD and performing the duties properly requires effort. The group agreed with the following statements of P4 and P7:

> *Opening and closing autoclaves requires physical strength. I do it several times a day. It is not easy (P4).*

> *[...] When loaded, the carts with the materials to be put in the autoclaves are quite heavy [...] (P7).*

Nursing professionals are often required to push and pull carts and racks to transport materials. The way they push such carts and racks can be a source to identify potential health risks and reveal whether they observe common practices or not.

The use of personal protective equipment and preventive vaccination are the protection and prevention measures adopted.

> *[...] I always get the recommended vaccines to protect myself [...] (P5).*

> *Preventive measures are important: the use of PPE, hand washing, as we are always exposed to biological risks, organic matter and waste. It is for our own health and safety. I exercise caution (P8).*

According to the interviewees, the adoption of preventive measures is directly related to the knowledge of the risks inherent to their responsibilities. Safe practices, trained professionals and self-care give visibility to CSSD work processes that focus on health promotion, safety, prevention and health care.

Talking about their work, nursing professionals recognise the importance of knowledge associated with self-care, which influence, however indirectly, the care provided to the patient.

> *I like working here very much [in the CSSD], given that it is an important department within the hospital. Many departments would not function without our work. I studied a lot to be able to work here and I take care of myself (P3).*

> *[...] I find working in the CSSD is great! We are exposed to risks but that happens in any other job. Some are more risky than others. We have to have knowledge, responsibility and prioritize to be able to work here (P1).*

The participants stress the importance of knowledge about protection. In this sense, personal and professional development raises the professionals' awareness about exposure and risk prevention and minimization measures at work.

Prevention and healthcare are revealed through the participants' speeches.

> *[...] I take care of myself. We need to protect ourselves [...] (P3).*

> *We need to take care [...] (P1).*

Such views encompass actions and behaviours regarding socialized risks that were agreed upon by the other study participants.

DISCUSSION

The nature of the CSSD work processes are viewed by nursing professionals as a production activity that supplies the hospital with decontaminated materials and instruments.[4,6] It requires adequate training and preparation to cope with the job's technological procedural and organizational demands.

Regulations on good CSSD practices date from 2012. They were published after data collection for the present research.[6,7] Faced with the need to regulate the duties of the nursing professionals working at the CSSD, the Federal Nursing Council published Resolution No. 424 / 2012.[8]

Occupations in different work areas entail different degrees of exposure. Noisy work environments have occupational hazards that are the noise itself, communication difficulties, difficulty to concentrate, to memorise, high levels of stress and excessive fatigue. Multiple noise sources was the most common physical hazard.[9,10] Exposure to potentially damaging noise levels was due to the professionals' lack of use of adequate hearing protection equipment. The uninterrupted triggering of equipment alarms, even when less intense, affects hearing.[11]

Musculoskeletal injuries are also common. Interventions to reduce musculoskeletal disorders among workers are im-

portant. In addition, management participation in the planning and implementation of changes can contribute to improve work environment and more positive work behaviours.[12] Actions that promote the well-being of nursing staff can improve their health.

In a hospital setting no procedures are performed without the items to be used going through the CSSD which highlights the relevance of the department. CSSD peculiarities impact directly the health of workers, their performance and the quality of indirect care they provide. Such peculiarities are associated with work processes, with environmental risks and with a precarious intersectoral communication.[13]

As regards to communication, interpersonal relationships and teamwork, the nurse as team coordinator may establish a web of relationships with other healthcare workers and professionals from different areas that even indirectly seek the CSSD department. In this context, such professional is the leader in interpersonal relationships through communication, involvement and active participation in the activities of the CSSD team.[14]

In addition, updating other units on CSSD activities, through technical explanations and demonstrations, can help other professionals to appreciate the importance of a nursing team. The nurses may be appointed as CSSD managers given their minute knowledge about processing material and equipment and their use in hospital being, therefore, able to systematize their provision.[6,15-16]

Process flows, equipment and workforce requirements are the nurses' responsibility. That professional can delegate technical undertakings to other members of the nursing staff under his supervision. The nurse is, therefore, a reference point to the team and other units of the hospital where communication and collaboration between teams are essential to the development of safe practices.[16-17]

The study results demonstrated that nursing professionals are aware of the risk of exposure to environmental hazards. Their concerns are related to the structural conditions that influence work processes that are potential health hazards or likely to cause accidents. Splashing of germicides, inhalation of toxic fumes and the miasma of chemical solutions were frequently mentioned by the professionals. Exposure to chemical risk occurs via the respiratory tract, skin contact or accidental ingestion, which requires the professionals' attention to the risks they are exposed to and knowledge about the care needed.[2,18]

Regarding disinfection of materials, exposure occurs while performing the activity and rinsing the inside and outside of surfaces with sterilized water, as required by AAMI TIR 34/2007.[19] For the study participants, working in the disinfection area demands constant attention, considering the level of exposure to chemicals.

Access to high temperature areas, poor air circulation and noise were also mentioned given the discomfort they generate in the handling of production equipment such as autoclaves. Concerning climate control, RDC 15 recommends good practices at room temperature, minimum flow per cubic meter and pressure between areas. The well-being of CSSD employees will improve as adjustments are carried out.[2,8]

The nursing professional performs duties that require much physical effort in unsuitable conditions. In this sense, ergonomic risk, such as intense pace of work, poor posture and various types of loads, have to be reconsidered. One-off and uncontrolled measures to prevent exposure to ergonomic risks can lead to imbalance and to the development of diseases.[3]

From this perspective, Regulation No. 32 (NR-32) establishes guidelines for the implementation of safety measures, including training, protection measures and programmes aimed at improving the workers' quality of worklife in a risky environment.[20]

The recognition of CSSD professionals and a better understanding of their work process are scarcely considered in the hospital. The challenge for the CSSD management is to give more visibility to the work process itself: indirect care, although based on scientific knowledge, could receive more social recognition.[16]

The study participants recognize the need for qualified staff working at the CSSD. This led to the discussion of measures to promote health and safety at work. According to those professionals, guidance, education, example, encouragement to critical practices and reflections to bring about safety and professional development contribute to abolish mistakes deriving from lack of information. According to them, handling of chemicals, contact with high temperatures, handling of materials with biological risk and exposure to acoustic discomfort, inadequate physical space and furniture influence the internal dynamics of the CSSD and the relationship between the staff.

FINAL CONSIDERATIONS

Nursing professionals that are aware of the risks they are exposed to remain attentive at all times, perform their duties safely, protecting themselves and their co-workers and intervening in situations that may have consequences to people, goods or the environment. Gaps in knowledge could compromise safety, interfere in actions to reduce risks and have an impact on self-care. In this context, improvement of the nursing team depends on enabling dialogic spaces that would connect existent knowledge to advances in specific, detailed and complex materials supply actions.

The size and variety of CSSD work processes requires a wider perception of the context in which the professionals are inserted not different from the context of other hospitals.

The present study allowed the researchers to extent their knowledge about the department's characteristics which may have an impact on how environmental risks in a centre sterile services department are managed, as well as, hopefully, encourage further research in the area.

Other institutions may have a different dynamic and results, due to different logistics and institutional organization. The researchers recognize the gap regarding researches in the northwest region of Rio Grande do Sul that address environmental risks at a CSSD. They consider, however, that it was useful to know nursing practices applied to environmental risks, to the nurses' day-to-day challenges and discuss possibilities for change. Further studies that foster safety and quality of the professionals' performance and that contribute to the construction of knowledge in worker's health and occupational nursing are necessary.

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