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## HEALTHCARE-ASSOCIATED INFECTIONS: PROFESSIONALS RISK PERCEPTIONS IN A HOSPITAL INSTITUTION

\*<sup>1</sup>Anna Paula Scoz Antunes, <sup>2</sup>Maria Conceição de Oliveira, <sup>3</sup>Patricia Alves de Souza, <sup>3</sup>Matheus Silva Melo, <sup>1</sup>Anelise Viapiana Masiero and <sup>1</sup>Bruna Fernanda da Silva

<sup>1</sup>Programa de Pós-Graduação em Ambiente e Saúde – PPGAS, Universidade do Planalto Catarinense – UNIPLAC, Lages, Santa Catarina State, Brazil

<sup>2</sup>Universidade Federal de Santa Catarina - UFSC, Curitibanos, Santa Catarina State, Brazil

<sup>3</sup>Universidade do Planalto Catarinense– UNIPLAC, Lages, Santa Catarina State, Brazil

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### ABSTRACT

This study is a qualitative descriptive research that aimed to identify the professionals risk perception working in health services in relation to Healthcare-Associated Infections (HAI). Thirty-one professionals working in a hospital in the State of Santa Catarina were interviewed. The interviews were recorded, transcribed and the data were subjected to content analysis according to Bardin, which resulted in the category "Health Services Risks". Improper cleaning of the environment was an important risk indicated by professionals, which shows relevant knowledge about the possible reservoirs of disease-causing microorganisms. However, it was possible to recognize that the professionals risk perception is more focused on occupational risk that the work environment can offer than the risk that users are susceptible when using the services if the professional practices are not properly executed.

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## INTRODUCTION

Every health service user has the right to receive a safe and qualified assistance. However, for this to occur, institution and the professional who will provide the care should guide their services in measures that minimize the risks that may cause some adverse event due to the assistance (Brasil, 2017a). In healthcare, the risk relates to a factor that frequently modulates with others the probability of an adverse event or the emergence of the disease (Costa and Carneiro, 2011). Adverse Events in health situations arising from errors or failures that may cause temporary or permanent damage to the patient (Moura and Magalhães, 2013). The Ibero-American Study of Adverse Events in Health (IBEAS) indicates that some type of damage caused by healthcare affected 10.5% of hospitalized patients (IBEAS, 2010). Healthcare-Associated Infections (HAI), also known as Hospital Infections (HI), are among the

\*Corresponding author: Anna Paula Scoz Antunes

Programa de Pós-Graduação em Ambiente e Saúde – PPGAS, Universidade do Planalto Catarinense – UNIPLAC, Lages, Santa Catarina State, Brazil

Adverse Events of a high psychological, social and financial impact, which causes an increase in hospitalization time, indiscriminate usage of antimicrobials, aside from making the hospital environment unsafe for both the user and the professional (Giarola *et al.*, 2012). Simple practices are recommended for the prevention and control of HAI, such as hand hygiene, biosafety standards that aim to minimize the physical (radiation or temperature), ergonomic (postural), chemical (toxic) and biological (infectious agents) risks. Cleaning and disinfection of the health services surfaces, good practices in the reprocessing of health products, control of antimicrobial usage and others (Brasil, 2009; Brasil, 2017b,c). Nevertheless, HAI is a worldwide concern and its indexes remain high (Nogueira *et al.*, 2009; Guimarães *et al.*, 2011; Gaspar *et al.*, 2012; Alves and Behar, 2013; Romanelli *et al.*, 2014). Therefore, in order to recognize the fragility that involves professional practice in health services, the objective of this study was to identify the professionals risk perception for the HAI in a hospital institution located in the State of Santa Catarina.

## MATERIALS AND METODS

It is a qualitative descriptive research, performed with 31 professionals who work in a large hospital located in a medium-sized municipality in Santa Catarina State, South region of Brazil. The hospital has approximately 200 beds and attends to several medical specialties, considered a reference for this region of Santa Catarina State. Nine professional categories were included in this study, among them: Physician (P), Nurse (N), Nursing Technician (NT), Technician in Radiology (TR), Pharmacist (PM), Physiotherapist (PT), Driver (DV), Internment Professional (IP) and Cleaning Professional (CP). The physicians, nurses and nursing technicians interviewed worked in the hospital high-risk areas for the occurrence of HAI: Surgical Center, Obstetric Center, Adult Intensive Care Unit, Neonatal Care Unit, Post-Surgical Hospitalization Unit, Burn Care Unit, Center of Materials and Sterilization (CMS). Therefore, five physicians, seven nurses and seven nursing technicians participated in this study.

Among the other participants, two professionals from each following categories were interviewed: pharmacists, responsible for dispensing medications, including antibiotics that can confer microbial resistance; physiotherapists, who provide assistance in direct contact with patients; cleaning professionals, who are responsible for the cleaning and disinfection of the places of internment; drivers, who carry patients who may be contaminated by micro-organisms; radiology technicians, who perform tests on patients who may be contaminated by microorganisms and internment professionals, who have the first contact with the patient and refer them to the hospitalization sectors. The participants in the research were professionals who agreed to record the interview and signed the Informed Consent Term (ICT). Each professional was interviewed in their workplace, respecting the availability and location indicated by each one of them.

Data collection was performed using a semi-structured interview script, composed by five open questions: "What do you consider health service risks?", "For you, what is the meaning of HAI?", "What is your main concern when conducting a procedure (related to the practice of each professional)?", "What are the main causes of HAI?" and "How can the environment interfere with infection control?". All interviews were recorded, transcribed and the data were submitted to content analysis according to Bardin (2009). For the analysis of the data, there were a sequence of procedures organized around three chronological poles: 1) pre-analysis; 2) material exploitation; 3) treatment of results, inference and interpretation (Bardin, 2009).

In the initial phase of the interview's analysis, a floating reading allowed a wide sight of the answers. After this phase, the sentences were grouped into pre-categories: "Workplace Risk", "Occupational Accidents", "Work Practice", "Identification of Causes of HAI", "Awareness", "Information and Knowledge" and "Others". After pre-categorizing and analysing the data, the following categories were defined as "Risks in Health Services", "Professional Practice" and "Causality Attributed to HAI". However, this article will discuss the category "Risks in Health Services" The Human Research Ethics Committee of the Universidade do Planal to Catarinense (CEP-UNIPLAC) authorized the research under protocol number 097-13.

## RESULTS AND DISCUSSION

The category "Risks in Health Services" has two subcategories: "Environment" and "Exposure", which addresses the risks related to work in health.

### Risks in Health Services: Environment

Regarding the subcategory "Environment", it was possible to identify the perception of the professionals in recognizing the existing risks in the work place. They recognized the existing structural limitations in the institution and pointed the need for planning and organization by those responsible for the institution.

**P2:** [...] *the physical environment [...] has to follow engineering norms and designs, use the suitable materials from flooring, handrails ... and I do not know ... it is the texture of paintings, door knobs, appropriate places for the construction of bathrooms [...].*

**NT1:** [...] *I think the hospital is poorly structured, poorly designed, poorly projected, poorly constructed, what comes from the superior, that is not discussed with the people who work there, about ideas, it is kind of designed as a normal building and then placed a hospital in it [...].*

The process of constructing a hospital institution must be based on ruling norms that order the architecture of health services (Brasil, 2002). For this, it is necessary that architects, engineers, nurses, doctors and other professionals constitute a multidisciplinary team capable of predicting, discussing and identifying risks, aiming to the building of an adequate structure for services (Saba et al., 2012). The professionals demonstrated understanding the difficulties related to the environment and the importance of developing changes that allow a safe and quality assistance.

**N6:** [...] *sometimes it depends on the environment structure's adequacy for you to be able to perform a security or infection control process. Sometimes the environment stops you from doing something correctly, that is it [...].*

In order to guarantee the improvement of the quality of assistance provided in health services, national and international bodies develop standards that should guide practices and provide support for knowledge about care to be disseminated and carefully applied (Brasil, 2017a,b,c,d). Institutions increasingly incorporate technologies to comply with service demands and the benefits are evident. However, for assistance to be given safely and effectively, it is necessary to involve professionals with a safety culture based on good practices, improvement of the teams, technologies and better working environment conditions. Therefore, it is fundamental to offer an adequate work structure and caution in the hospital environment.

**P5:** *The environment needs dimensions and an adequate structure for the provision of that kind of service. There are standards already defined as appropriate for certain health care, so I think the first step is: this environment has to be pleasant [...], it has to offer security, easy cleaning and perception of lighting abnormalities, compatible with the place of care destined and respected for that purpose [...].*

**NT1:** [...] the doors could be easily accessible so you do not need to put your hand on a doorknob [...].

Believing that only the professional who provides the direct assistance to the patient is responsible for the control of HAI is to ignore the complexity and the interdisciplinary character that involves the health services, since multiple dimensions like historical, cultural, biological, technological or human, are part of the care (Pereira *et al.*, 2005). Therefore, the control of HAI involves knowledge and attitudes that need enforcement to its effectiveness.

**N7:** [...] I need an adequate place to clean specific materials, for example, the endoscope. I need a very deep tank to wash this endoscope, running water, an air gun, a water gun [...] and again the environment can interfere when cleaning and disinfection are not done properly.

For the health services to receive both professionals and users with quality and safety, it is indispensable to identify and control the risks in this environment (Silva *et al.*, 2012). Inanimate surface contamination should be considered in the presence of bacterial colonies small forming units (Carreiro *et al.*, 2014), because they can remain viable for up to 14 days without the presence of organic material, which evidences contamination risk offered by the environment (Rossi *et al.*, 2008).

The surfaces of the hospital environment are identified as agents that spread infection, compromising the quality of assistance in health services (Ferreira *et al.*, 2011; Carreiro *et al.*, 2014). Contamination by pathogenic microorganisms were found on doorknobs and in the hospital environment, what reinforces the importance of preventive measures, such as hand washing and proper cleaning of the environment (Silva *et al.*, 2012). It is important to advocate measures for prevention and control of HAI, involving all the professionals who perform their activities in the institution, since all of them are part of the health service and share the same workplace.

**P1:** [...] the main factor I see is exactly the overpopulation of our surgical centers; I have nothing against it because I think it is part of evolution [...].

**PM1:** Risks are so many things; it is contact with contaminated patients and materials, the environment itself if it is not clean. The environment includes everything, our dining hall, bathroom, everything. I think even more: contact with the patient and hygiene are the main risks [...].

Risks related to assistance failures, such as the breaking protocols for protective measures and professional techniques can increase the chances of damages related to HAI, so it is fundamental that everybody is engaged in prevention and control of these (Brasil, 2017c).

At the same time they recognize the lack of cleanliness as a risk factor, it is implicit on the professional's speech that they may be able to develop and reflect about their conducts.

**N3:** [...] the environment becomes an infectious potential, because today we see that the bacteria can stay in the environment for a long time, especially these multiresistant. Therefore, I think the most important thing is cleaning and beware of the things you will discard, where you walk, hands,

gloves and between one patient and another, doorknobs, care of the procedures.

Often, the trivialization of procedures and the overconfidence lead many professionals to neglect simple care measures, such as the use of Personal Protective Equipment (PPE), which can lead the professionals themselves to illness (Brand and Fontana, 2014). Although the main causes of infections relate to patient susceptibility and invasive techniques, responsibility for asepsis, cleaning of the environment and professionals conduct should be considered for the control of infections, emphasizing that the professional can act as a carrier of the causative microorganisms of HAI (Caetano *et al.*, 2011; Rodrigues *et al.*, 2012).

### Risks in Health Services: Exposure

The subcategory "Exposure" is a major concern of professionals and involves, among others, the occupational risks related to exposure to biological materials, which may occur from accidents with piercing materials or through contact with mucous membranes and skin.

**N2:** I think the main risk in health services is the contact, the contact with everything, with people, with secretions, with everything.

**P4:** [...] risk with piercing materials, multi-infected patients or infected patients with multiresistant bacteria [...]

**N3:** [...] we work very exposed to various secretions, from aspiration, which can result on cough, to the blood issue, when the patient has an abscess and you get exposed to purulent secretions, infected patients [...].

To minimize the risks related to contact exposure, professionals are advised to adhere to standard precautions that should be applied in their practice; however, adherence of these measures is related to individual factors experienced by those professionals (Pereira *et al.*, 2013). The control of IRAS becomes an individual and collective process (Pereira *et al.*, 2005). Therefore, control programs must be created to individually or collectively apply for the quality of work and safety of the patient.

It was possible to identify that the professional considers the patient as a risk factor for his own welfare, which can interfere in the quality of the assistance provided.

**D2:** It is to contaminate ourselves with the bacteria that the patient is contaminated [...].

**CP2:** What do I consider a risk? Being infected by a bacteria, or to do a service you do not have to [...].

The occupational risks pointed by the professionals may lead to their illness and compromise the development of work in the institution, generating stressors that suggest psychosocial risks caused by the inherent responsibility in working with human lives (Souza *et al.*, 2012).

Besides the contamination risk, professionals also identify problems that may be caused by exposure to chemical, mechanical and sonorous agents.

**NT6:** [...] ergonomic, chemical risk, you are exposed to a lot of chemical products, antibiotics and physical risks as well.

**N3:** [...] falls, not only related to patients, but I think about the issue of physical and sonorous risks [...].

The ergonomic risks that can lead professionals to temporary or permanent diseases relates to inadequate work, organization and structure (Lelis *et al.*, 2012). Much of the research seeks to identify, with professionals, the risks that they are exposed to in the workplace (Penatti *et al.*, 2013; Sulzbacher and Fontana, 2013; Soares *et al.*, 2013), forgetting to identify the professionals perception of the risks that their activity can offer to each other. Factors such as intense work activity and scarce resources are predictors of physical and emotional exhaustion. Therefore, an efficient risk management that considers both human and material resources should be able to build a safe workplace for all those involved in care (Camelo *et al.*, 2012).

Issues that depend on organizational demands and require managerial intervention have been identified.

**P4:** [...] overtime working, overload of patients, this also leads to a health risk.

**NT6:** [...] psychic risk, because we work in a very stressful service [...] we do not see just a few people having psychic problems due to work [...].

Risks associated with work strain can lead to serious accidents and result in physical and psychological problems that trigger demotivation and decrease productivity and alertness, harming all those involved in the care process (Souza *et al.*, 2009; Lima *et al.*, 2011).

Professionals also pointed the importance of having information as an important appliance for care.

**N2:** I think the environment has to be firstly organized and the team has to be informed of all the PPEs, for example, that you might be using. And the environment has to be totally clean. I think the hygiene sector also has a large share in that and nursing too [...].

The importance of developing a culture based on prevention and biosafety with well-established norms allows the professionals to incorporate a more secure and quality posture in front of the assistance provided (Saba, 2012; Valle *et al.*, 2012).

All the professionals who work at the institution, nursing, cleaning, pharmacy or other activities need to be aware of the risks that the health services can offer to themselves and to the users. Working in tune with the development of care measures is everyone's responsibility.

**IP1:** [...] it starts with us at the hospitalization, taking the patient out of the ambulance to inside the hospital [...] the reception.

**P1:** Look, I work at a restricted environment, only qualified people enter and participate in the acts. But today we have the participation of many students, so this increases the risk, because it is people less accustomed or in contact for the first

time, and sometimes the own tumultuous thing within a routine may increase the risk of accidental contamination [...].

Due to the service complexity, all professionals who perform their functions in the institution, whether direct or indirect contact with patients, are exposed to risks (Lima, 2011). Health institutions are unhealthy environments with difficult innovation regarding the work organization (Felli, 2012).

Some professionals related their practice to the risk in the service by describing events that may compromise the assistance.

**N5:** [...] the incubator alone will not contaminate anyone, the equipment alone will not contaminate if it does not have that source, which is that contact;

**N2:** About infections, we always try to maintain a good level of cleanliness here, because we know that the biggest transmitter is our hands, it is the contact [...].

Considering that hand hygiene is the most widespread principle for infection control in the world and has an important role in patient and professional safety, this care can avoid the risk of contamination for both (Rezende *et al.*, 2012).

Few professionals interviewed referred to the risks related to Adverse Events which users of the hospital are exposed to.

**N7:** [...] the greatest problem found in hospitals, because infections are difficultly get by indirect contact, it is by direct contact, this is the responsibility of the professional caring for the patient [...].

**NT4:** [...] in fact, if you offer a clean environment and follow the rules you can reduce the number of infections very much.

A study carried out in São Paulo also points the difficulty of professionals in recognizing and conducting aspects related to the patient's safety (Saba *et al.*, 2012). The fragility of health professionals' perception of risk regarding their work process is evident, since there are few references to the practice of each one as a factor that predisposes to the risk of infections. It is confirmed in researches where professionals attribute a large part of HAI to materials and equipment used in health services (Turrini, 2000; Santos *et al.*, 2008). A global perception of patient's safety will guarantee the quality of the assistance and then minimize the occurrence of Adverse Events and risks that can affect both the patients and the professionals involved in the work (Oliveira and Paula, 2013).

## Final Considerations

Risk perception is a complex process and involves the singularities expressed in the professionals' experiences. In this sense, there is a multifactorial implication, demonstrating the broad spectrum of perceptions. The way in each one perceives the world around them and the risks existing in this environment are decisive in the decision-making process. The control of HAI involves knowledge and attitudes that must be applied to its effectiveness, since multiple dimensions are part of the care, whether they are historical, cultural, biological, technological or human (Pereira *et al.*, 2005). Therefore, all professionals are responsible for the control of infections in the health services, which makes HAI an interdisciplinary matter.

Inadequate cleaning of the environment was an important risk pointed by the professionals, which shows a relevant knowledge about the reservoirs of microorganisms that cause infections. However, it was possible to identify that the professionals risk perception focuses mostly on the occupational risk that the work environment can offer than on the risk that the user undergoes when using the services in case that professional practices are not performed properly. Issues such as patient safety and quality of life at work are being increasingly debated. Perhaps this discussion occurs due to health work involving multiple components important to health care. Many lives are involved in the care process, so these services become so complex and bear a great burden of responsibility. With this emerges the interdisciplinary theme, which presents itself as a necessary course for the analysis and intervention of the daily emerging problems (Scherer and Pires, 2011). In order to guarantee risk-free care, agencies such as ANVISA, the World Health Organization, among others, have been mobilized with the creation of campaigns directed at patient's safety in health services. However, the quality of care will not change as long as professionals do not take ownership of a safety culture in which the identification of risks arising from the environment, the procedure or even their conduct in providing assistance is present in their daily lives. It is suggested to improve the curriculum of the health courses with themes that involve patient's safety and consequently the control of HAI, as well as intensifying the permanent education to all professionals who work in health services.

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