Related factors to the application of Biosecurity’s measures in nurses at a Surgical Center in a Peruvian Hospital.

Factores relacionados con la aplicación de medidas de bioseguridad en el enfermero de centro quirúrgico en un Hospital Peruano

**ABSTRACT. Objective:** To determine the factors involved in the implementation of biosecurity measures for the nursing professional in the Surgery Center of the Dos de Mayo National Hospital - 2015. **Materials and Methods:** This study was a quantitative, cross-sectional method. The study population consisted of 30 nurses working in the Surgical Ward Service Center of the Dos de Mayo National Hospital. The technique used was the survey questionnaire and a structured instrument. **Results:** 56.7% of nurses presented unfavorable factors and 43.3% presented favorable factors to the application of biosecurity measures. Regarding personal factors, 66.7% are unfavorable and 33.3% favorable; and regarding institutional factors, 53.3% have favorable factors and 46.7% have unfavorable factors. **Conclusions:** The unfavorable factors that intervene in the application of biosafety measures in the nursing professional are the personal characteristics such as young adulthood, without specialized studies and lack of training in biosafety; and favorable factors in minority are conditions of service such as having an office of epidemiology, permanent supervision during the application of biosafety measures and have risk-free environments.

**Keywords:** Biosecurity, Peru, personal and institutional factors, surgical center, nursing

**RESUMEN. Objetivo:** Determinar los factores relacionados con la aplicación de medidas de bioseguridad por el profesional de enfermería del Servicio de Centro Quirúrgico (SCQ) de un Hospital Nacional. **Material y método:** El estudio fue de enfoque cuantitativo, nivel descriptivo, diseño no experimental de corte transversal. La muestra estuvo conformada por 30 enfermeros que laboran en el Servicio de Centro Quirúrgico un Hospital Nacional Peruano. La técnica utilizada fue la encuesta y el instrumento un cuestionario estructurado de autoría propia confiable y válido. **Resultados:** El 56.7% de enfermeros presentan factores desfavorables y 43.3% presentan factores favorables a la aplicación de medidas de bioseguridad. Con respecto a los factores personales, 66.7% son desfavorables y 33.3% favorables; y con respecto a los factores institucionales, 53.3% presentan factores favorables y 46.7% presentan factores desfavorables. **Conclusiones:** Los factores desfavorables relacionados con la aplicación de medidas de bioseguridad por los enfermeros son las características individuales tales como edad adulta joven, ausencia de especializaciones y la falta de formación en bioseguridad; y los factores favorables, presentes en minoría, son las condiciones del servicio como contar con oficina de epidemiología, supervisión permanente durante la aplicación de medidas de bioseguridad y disponer de ambientes exentos de riesgos.

**Palabras clave:** Bioseguridad, enfermero, factores, quirúrgico, hospital, enfermería.
INTRODUCTION

The World Health Organization (WHO) in 2015 estimated that worldwide, 5 to 10% of workers in hospital centers acquire an infection or incubate it, and 3 to 5% die from its cause. The incidence of diseases of transmission or biological contagion, transmitted circumstantially by patients in the operating room, is a latent risk for health personnel.\(^1\) One third of these deaths could be avoided with infection control programs and compliance with preventive norms such as biosecurity measures.\(^2\)

According to the Ministry of Health of Peru (MINSA by its acronym in Spanish), work accidents occur more frequently in nurses (65 to 70%)\(^3\) and occur more frequently in the patient’s room (60 to 70%) and in surgical centers (20 to 25%).\(^4\)

In the Hospital where the study was conducted, in 2015 a total of 86 to 98 cases of occupational accidents were reported, in which 83% to 88% was due to sharp objects and 13% to 17% due to splashing of biological fluids. Likewise, the occupational group most affected was the nursing professional (50% to 52%). The highest number of cases of work accidents due to sharp objects occurred in the surgical centers (64%).\(^5\)

The origin of occupational accidents focuses on the application of biosecurity measures. However, the application of these measures is affected by a series of factors own of the nurses, as well as institutional factors. Proof of this are the studies that were consulted in this regard. Thus, in a Hospital of Venezuela it was found that although the nurse has knowledge does not apply biosecurity measures in professional practice, likewise in the organization aspect there were no biosecurity manuals in the area where they work and in relation to the appearance most of the administrative consider scarce the supply of protective equipment.\(^6\) Another study in the same country found that the favorable factors for the application of biosafety measures by the nurse are specialization, Masters, Doctorate, knowledge of concepts, use of protective lenses, impervious apron, material endowment, environments and personnel.\(^7\) At the national level, a study conducted in a hospital similar to the one of the study, found that 61.9% of nurses do not have specialized studies in the surgical center, 52.4% do not know about the disposal of hypodermic needles, 57.1% report that is insufficient personnel, that the design and structure is inadequate, that they do not have waterproof aprons, the surgical clothing is incomplete and 76.2% report that the provision of equipment such as protective lenses is inadequate.\(^8\)

According to the bibliographic review, according to the United Nations Environment Program (UNEP), universal precautions are measures to reduce the risk of transmission of infectious contagious diseases related to work.\(^9\)

The main biosecurity measures that should be applied in the surgical center involve the proper handling and disposal of puncturing elements, discarders and healing material; management, treatment and final disposal of bio contaminated and common solid waste; use of personal protective equipment, hand washing, wearing gloves, mask, hat, boots, protective aprons and protective glasses; in addition to personal protection measures such as immunizations against hepatitis B and tetanus; among others.\(^10-21\)

However, considering that factors are called the underlying influence responsible for part of the variability of some behavioral manifestations,\(^22\) it can be said that there are different factors that determine the behavior of nurses. Therefore, the performance of a function, in this case, the application of biosecurity measures; is favored or affected by intrinsic or personal factors such as age, training, motivation and experience in the work area; and extrinsic factors, among them social, cultural, family or organizational.\(^23-24\)

For the purposes of this study, in addition to personal factors, attention was paid to institutional factors such as training, physical work environment, social structure of work, recognition of merit and staffing.\(^25-26\)

For the mentioned and under the concern that the number of hospital-acquired infections increased in the study Hospital, which demonstrates the need for greater rigor in complying with biosafety measures, and which in turn constitutes a challenge in practice of surgical nursing. The study was proposed seeking to contribute to propose corrective strategies and develop improvement interventions on working conditions that favor correct biosecurity practices in the health care of the nursing professional. Therefore, the research aimed to determine the related factors to the application of biosecurity measures by the nursing professional of the Surgical Center Service (SCS) of a Peruvian National Hospital.

MATERIALS AND METHODS

The study was a quantitative approach, descriptive level, non-experimental cross-sectional design. The sample consisted of 30 male and female nursing professional who worked in the Surgical Center Service of a Peruvian National Hospital and who agreed to participate in the study with the signing of informed consent.

For the collection of information, the technique used was the survey; and the instrument, a structured questionnaire with 26 items on the personal and institutional factors. The same one that was subjected to content and construct validity by expert judgment and valued in the Binomial Test table with p = 0.0298 (valid). In addition to presenting Cronbach’s Alpha of
0.86, which means it is highly reliable. The processing and analysis of results was carried out with code table, using the descriptive statistics through the statistical package SPSS version 24.

For the categorization of the variable, the arithmetic average was applied globally and by the dimensions of each variable, the variable adopting the value of an unfavorable and favorable factor.

RESULTS

Regarding the related factors to the application of biosecurity measures by nurses of the Surgical Center service of a Peruvian National Hospital, it is observed that 56.7% have unfavorable factors and 43.3% favorable (Graph 1). The unfavorable indicators were that nurses are very young 43.3%, without specialty studies 66.7% and without training in biosecurity 93.3%; while the favorable indicators were that the institution has 100% Epidemiology Office, there is permanent supervision regarding the application of biosecurity measures 93.3% and the environment is free of risks 93.3%.

![Graphic 1](image1.png)

**Related factors to the application of biosecurity measures by the nurses of the Surgical Center service**

Regarding the personal factors related to the application of the biosecurity measures by the nursing professional, 66.7% are unfavorable factors and 33.3% are favorable (Graph 2). The unfavorable indicators were age, less than 30 years (56.7%), not having the specialty in surgical center (76.7%), not having attended biosafety trainings in surgical centers (93.3%), and experience in child service, one year (90%); while the favorable indicators were a minimum percentage.

![Graphic 2](image2.png)

**Personal factors related to the application of biosecurity measures by the nursing professional of Surgical Center**

Regarding the institutional factors related to the application of biosecurity measures by the nursing professional, 53.3% presented unfavorable factors and 46.7% favorable (Graph 3). The unfavorable indicators were that the institution does not have complete biosecurity materials 43.3%, there is insufficient staffing and surgical clothing 80%; while the favorable indicators were that the institution has the regulations and MOF 100% and has an epidemiology office in charge of the control and monitoring of biosafety norms 10%, permanent supervision regarding the application of biosecurity measures 93.3% and the Service environment is 93.3% risk-free.

![Graphic 3](image3.png)

**Institutional factors related to the application of Biosecurity measures by the nurse of Surgical Center**
DISCUSSION AND CONCLUSIONS

The unfavorable factors globally represent (56.7%) in the application of biosafety measures, identified mostly as personal characteristics of nurses. Favorable global factors (43.3%) are related to the institutional conditions offered by the service or establishment. In this regard, Sabrera reported mismatch findings, since he found that nurses say that the institutional factor disadvantage their application due to lack of regulations, poor staffing; and the personal factor favors its application because of specialty studies and training in biosafety. This discrepancy may lead to the analysis of the influence of the quality of hospital management on the application of biosecurity, without neglecting the individual aspect.

Personal factors The unfavorable personal factors related to the application of biosafety measures by the nursing professional of the Dos de Mayo National Hospital; they constitute 66.7%, in a greater percentage they are represented by nurses under 30 years of age, without a specialty in the surgical center, without training on biosafety in the surgical center and with less than one year of experience. The study by Artigas reported mismatch findings, due to the fact that he considered having a specialization study and updated biosafety training as a favorable factor in biosecurity application. In this regard, Subiabre argued that in mature adulthood is where the maximum of mental faculties is reached, these will favor an optimal and efficient performance during the professional exercise. Likewise, specialized training in surgical centers, strengthens broad knowledge about aspects that are directly or indirectly related to preventive awareness. Regarding with that, it can be deduced that work experience is an important factor, since as the nurse stay more time exercising their skills in the specialty, they will achieve greater knowledge and experience, a condition that will allow them performance a better and more safety develop in their work. On the contrary, when it is young and inexperienced; their performance level is still in development and that is when there a risk of accidents. Therefore, with experience and adequate professional training in biosafety in surgery, will be in better conditions for an efficient performance based on theoretical knowledge, so we would expect a practice free of occupational risks, motivation to perform correctly and assess their job skills.

Institutional factors The institutional factors related to the application of biosafety measures; they are unfavorable (53.3%). In this regard, Artigas reported matching findings, found that the nurses point out that the favorable factors in the application of biosafety measures are having adequate and sufficient materials, in addition with appropriate environments. Contrasting with the results of both studies, it was found that the institution has appropriate environments free of risks, but at the same time, with little or insufficient staffing of nursing personnel. From the above, it is deduced that in the Hospital the situation could be considered as critical, since as a public hospital, they go through a situation of shortage and abandonment by the state, not having the necessary budget for the acquisition of resources human, material and modern equipment to meet the demands and modernity and meet the demands and needs of services. On the other hand, by not developing policies of encouragement and motivation of nursing personnel, it is difficult to have nurses committed to the quality of care and the application of biosafety measures for safe surgery free of risk for both the patient and the nurse herself. This is reflected in the scarce impulse to the training of the personnel and the support of the specialization in the Surgical Center of nursing professionals, which is in detriment of the quality of nursing care.

It is concluded that the global factors related to the application of biosafety measures by the nursing professional of the Surgical Center Service are unfavorable mainly in the personal characteristics such as: young adulthood, without specialty studies and not having training in biosafety; and the favorable global factors in minority are conditions of the service, to have permanent supervision during the application of biosafety measures and to have environments free of risks. Likewise, the unfavorable institutional factors related to the application of biosafety measures by the nursing professional were: insufficient provision of materials and supplies for compliance with biosafety norms and the limited number of nursing professionals in the service, constituting a risk of accidents and diseases due to lack of inputs and work overload.

Conflicts of interest: The authors declare that there are no conflicts of interest.
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