

## Biossegurança: fatores de risco vivenciados pelo enfermeiro no contexto de seu trabalho

Biosafety: risk factors enhanced by the nurse in their work context

Bioseguridad: factores de riesgo experimentados por enfermera en su contexto de trabajo

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### ABSTRACT

**Objective:** The study's goal has been to know and further analyze the scientific production in relation to biosafety and the risk factors experienced by nurses in their hospital framework. **Methods:** It is an integrative review of the literature, which was carried out over the period from 2009 to 2016, using the *LILACS*, *MEDLINE* and *BDENF* databases. **Results:** Of the 65 articles found with national impact, 10 met the inclusion criteria. By analyzing the articles, it was possible to identify themes that address biosafety with emphasis on professionals who act directly in the health care service. Based on the data, a number of risk factors present in the daily work of the nurse that directly and/or indirectly affect their integrity, physical, moral and psychosocial well-being are listed. **Conclusion:** It is understood that when considering the nurses' work context, the biosafety actions need to be anchored in public health policies, as well as in the continuing education of professionals and their participation in the programs of control and adoption of safety measures.

**Descriptors:** Biosafety, nursing, occupational health.

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## RESUMO

**Objetivo:** Conhecer e analisar a produção científica em relação a biossegurança e os fatores de risco vivenciados pelo enfermeiro no seu contexto hospitalar. **Método:** Revisão integrativa da literatura, realizada no período de 2009 à 2016, nas bases de dados LILACS, MEDLINE e BDENF. **Resultados:** De 65 artigos encontrados, de publicação nacional, 10 atenderam os critérios de inclusão. Ao analisar os artigos foram identificadas temáticas que abordam a biossegurança com ênfase nos profissionais que atuam diretamente na assistência. A partir dos dados elencou-se alguns fatores de risco presentes no cotidiano de trabalho do enfermeiro que de forma direta e/ou indireta possam afetar sua integridade, bem estar físico, moral e psicossocial. **Conclusão:** Entende-se que nas ações de biossegurança nos contextos de trabalho do enfermeiro, precisam estar ancoradas nas políticas públicas em saúde, bem como na educação continuada dos profissionais e sua participação nos programas de controle e adoção de medidas de segurança.

**Descritores:** Biossegurança, Enfermagem, Saúde do Trabalhador.

## RESUMEN

**Objetivo:** Investigar y analizar la producción científica en relación con la bioseguridad y factores de riesgo experimentados por las enfermeras en su contexto hospitalario. **Método:** integradora de la literatura que tuvo lugar en el período 2009 a 2016, las bases de datos LILACS, MEDLINE y BDENF. **Resultados:** 65 artículos encontrados en una publicación nacional, 10 cumplieron los criterios de inclusión. Mediante el análisis de los artículos se identificaron los temas que abordan bioseguridad enfatizando los profesionales que trabajan directamente en la asistencia. A partir de los datos que se enumeran algunos factores de riesgo en el trabajo diario de la enfermera que directa y / o indirectamente puedan afectar a su integridad, buen físico, moral y psicossocial. **Conclusión:** Se entiende que las medidas de bioseguridad en el entorno de trabajo de enfermería, deben estar ancladas en políticas de salud pública, así como la formación continua de los profesionales y su participación en el control y la adopción de programas de medidas de seguridad.

**Descritores:** Seguridad de la Biotecnología, Enfermería, Salud Ocupacional.

## INTRODUCTION

In the Health Ministry, the *Comissão de Biossegurança em Saúde (CBS)* [Health Biosafety Commission] established by Ordinance GM/MS No. 1683, from August 28<sup>th</sup>, 2003, is in charged to deal with Biosafety. Its objective is to implement strategies for action, evaluation, and follow up of actions related to Biosafety in health, seeking a relationship between the Health Ministry, organs and entities related to this matter.<sup>1,2</sup>

Several authors conceptualize biosafety as a set of actions and care that prevent, control, reduce or extinguish factors or aggressors that could endanger human, animal and environmental health. In the field of health, it seeks to develop actions aimed at promoting well-being and protection of the worker's life, establishing infection control measures for the protection of the health team, users and the population.<sup>3</sup>

In the context of health biosafety, this can be presented in two distinct ways: the first, directed to research and manipulation of DNA and stem cells, and the second - and

most practiced - occurs in health institutions from contact with agents chemical, physical, biological, ergonomic and psychosocial factors in these environments. In this sense, in the health institutions themselves, adopting biosafety measures may represent a present challenge in the daily life of health professionals, especially nurses.<sup>3</sup>

Among the challenges, we have highlighted is the dichotomy between theory and practice, in which theory is not being effectively inserted into the daily actions of these professionals. It is possible to see that one of the reasons for this dichotomy lies in the professional himself who over time acquires confidence in his professional capacity and, often, begins to neglect self-care in relation to biosafety. This careless approach, in the development of his professional activity, ends up putting his health at risk and becoming the victim of frequent accidents in the universe of his work. Nevertheless, many of these risks are controllable and are anticipated and recommended by biosafety standards, for the simple fact of not being aware of biosafety standards.<sup>4</sup>

Faced with this issue, it is necessary to consider the space in which nursing professionals are exposed to pathogenic biological agents and the unhealthiness existing in a stressful environment that requires much more than the techniques and knowledge of each involved in their work process. In the face of many events, it was only in the 1980s that biosafety was recognized worldwide by the World Health Organization,<sup>2</sup> conferring on Brazil the title in the International Biosafety Training Program in Latin America. Nonetheless, biosafety in Brazil has only gained representativeness since the 1990s with its inclusion as a discipline in undergraduate and postgraduate courses and has been actively developed in public and private institutions, receiving significant contributions in the and academic circles.<sup>4,5</sup>

The technical/scientific advances lead the work in biosafety so that the hospital institutions feel the need to invest in the qualification and improvement of its collaborators in a transdisciplinary way, emphasizing the aspects of integrality considering it as a dynamic process involving the transformation procedures in that the country lives. This way of proceeding leads us to realize the importance that the change of behaviors and attitudes has in relation to the new paradigm that focuses its attention on the promotion of health and not more exclusively on the disease.<sup>6</sup>

This study reveals great importance for being inserted in the National Agenda of Research Priorities, chapter 3 item 3.1.3 emphasizing the attention directed to occupational health. Another point of relevance is based on the need to deepen this theme to contribute with subsidies capable of collaborating and providing a better quality of life for health professionals, especially nurses.<sup>7</sup>

Given the aforementioned, the following question applies: What is the scientific production during the period from 2009 to 2016 regarding biosafety and the risk factors experienced by nurses in their hospital context? In order to answer this question, the study's objective is as follows:

To know and analyze the scientific production during the period from 2009 to 2016 in relation to biosafety and the risk factors experienced by nurses in their hospital setting.

## METHODS

This is descriptive-exploratory research with a quantitative approach, which was carried out by the integrative review method. This method seeks to assemble, organize and synthesize the research results about the subject in a systematic way, with the intention of promoting greater familiarity with the subject under study. From the data and its analysis, it was possible to find evidence that contemplates the challenges experienced by the nurse regarding the biosafety.

With the purpose of knowing the scientific production on biosafety and risk factors experienced by the nurse, thematic under study, the search in the *Biblioteca Virtual em Saúde (BVS)* [Virtual Health Library] of articles related to the theme was done online. We used the descriptors of health science: Biosafety, Nursing, and Occupational health. As a search strategy, the research was carried out in the electronic databases of the *Centro Latino-Americano e do Caribe de Informações em Ciências da Saúde (LILACS)* [Latin American and Caribbean Center for Health Sciences Information], database specialized in biomedical sciences and life sciences (MEDLINE) and *Base de dados da Enfermagem (BDENF)* [Nursing Database]. It was established as inclusion criteria: be an article written in Portuguese, English and/or Spanish full text, published in the period from 2009 to 2016, available online, free of charge and contemplating the subject under study.

Initially, when using the biosafety descriptor, 127 articles were found in the *LILACS* database, 07 articles in MEDLINE and 30 in the *BDENF* database. Refining this result with the nursing descriptor, 50 articles were identified in the *LILACS*, 02 articles in the MEDLINE and 41 articles in the *BDENF*. In addition to the descriptive occupational health, 34 articles were collected in *LILACS*, in MEDLINE 02 articles, and in *BDENF* 29 articles, generating a total of 65 articles. The preliminary analysis of these articles indicated that 10 fulfilled the established criteria, reason why will be considered in that proposal. The articles that were analyzed in this study were published from 2009 to 2016.

In order to better visualize the data from this research, a table was constructed containing the following aspects: article number, year of publication, periodical in which it was published, methodological approach used, title and objectives. The data were described, verifying the absolute frequency (n) and respective percentage (%).

Regarding ethical aspects, authors' authorship, the Copyright Law, both in direct and indirect citations, were observed and respected.

## RESULTS

In order to provide better visibility and objectivity, the data obtained in the 10 selected articles dealing with the topic under study were organized and are presented in **Table 1**.

**Table 1** - Distribution of research data in relation to the year of publication, journal in which they were published, title, methodological approach and purpose of publication

| ARTICLE | YEAR | JOURNAL*                                  | TITLE*  | METHODOLOGY  | OBJECTIVES  |
|---------|------|---|---|--------------|---|
| 1       | 2009 | Revista da rede de enfermagem do nordeste | Processo de trabalho em setor de emergência de hospital de grande porte: a visão dos trabalhadores de enfermagem. | Qualitative  | To know the nursing workers viewpoint about the work process developed in the emergency department of a large hospital.   |
| 2       | 2009 | Revista Ciência Cuidado e Saúde           | Educação continuada na prevenção dos riscos biológicos da equipe de enfermagem na instituição hospitalar          | Qualitative  | To identify in the literature the strategies used by the continuing education program towards the prevention of biological hazards.   |
| 3       | 2010 | Revista de Enfermagem UERJ                | A biossegurança sob o olhar de enfermeiros  | Quantitative | To know the social representations of biosafety produced by nurses and to analyze how these representations influence the practice and quality of nursing care in critical areas. |
| 4       | 2011 | Revista Brasileira de Ciências da Saúde   | Biossegurança: Conhecimento e adesão às medidas de precauções padrão num hospital                                 | Quantitative | To identify the procedures used by the nursing team that minimize biological hazards and verify the occurrence of occupational accidents with the nursing team.                   |

(To be continued)

(Continuation)

| ARTICLE | YEAR | JOURNAL*                               | TITLE*  | METHODOLOGY  | OBJECTIVES   |
|---------|------|--|---|--------------|--|
| 5       | 2013 | Enfermagem Revista                     | Acidentes ocupacionais com material biológico: a atuação do enfermeiro do trabalho.                   | Qualitative  | To understand the performance of the nurse before the occurrence of occupational accidents with biological material, as well as in its prevention. |
| 6       | 2013 | Revista Eletrônica Acervo Saúde        | Conhecimento e aplicação dos conceitos de biossegurança no dia a dia do trabalhador da saúde          | Qualitative  | To check if the concepts are being applied in the daily routine of these professionals.  |
| 7       | 2013 | Revista Brasileira de Enfermagem       | Multicausalidade nos acidentes de trabalho da enfermagem com material biológico                       | Qualitative  | To analyze the multicausality of work accidents with biological exposure.  |
| 8       | 2014 | Revista Brasileira de Enfermagem REBEn | Biossegurança na perspectiva da equipe de enfermagem em Unidades de Tratamento Intensivo              | Qualitative  | To investigate knowledge and practices of the nursing team about biosafety within Intensive Care Units.  |
| 9       | 2015 | Revista de Enfermagem UERJ             | Acidentes de trabalho com enfermeiros de clínica médica envolvendo material biológico                 | Quantitative | To verify if the accidents with biological material in medical clinic nurses occur more frequently among the nursing resident students.            |
| 10      | 2016 | Revista Brasileira de Enfermagem       | Representações sociais da Enfermagem sobre biossegurança: saúde ocupacional e o cuidar prevencionista | Qualitative  | To apprehend the social representations of biosafety prepared by nursing professionals in Primary Care.  |

**Source:** Authors provided data.

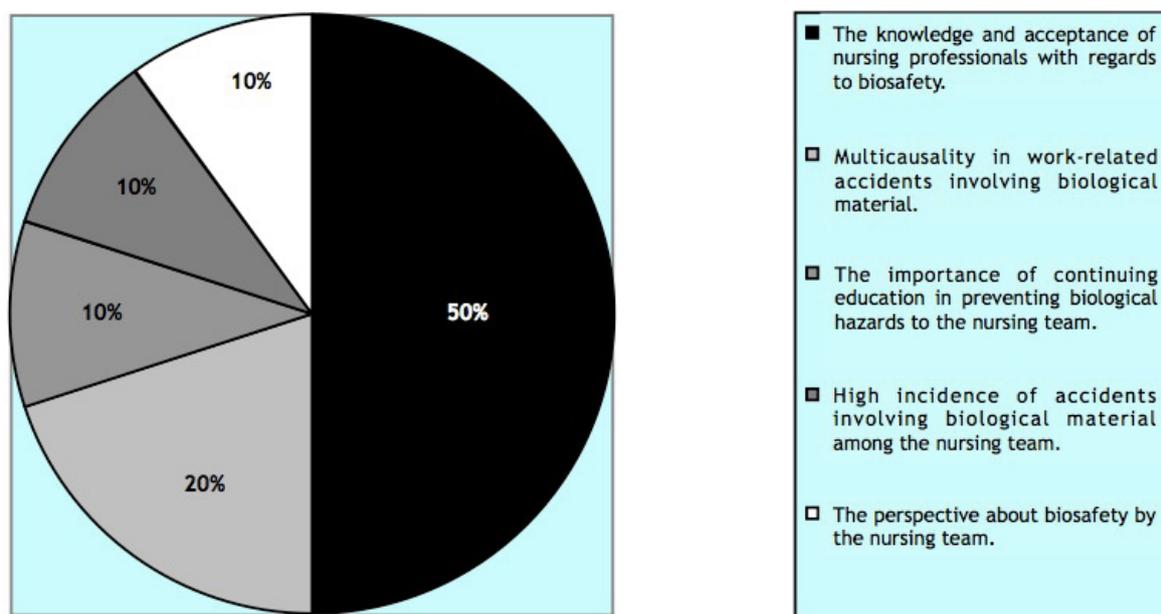
**Note:** The journal's and title's names were kept as original (Portuguese Language).

As for the year of publication, two (20%) articles were located in 2009; in 2010 and 2011 one (10%) article, in 2013 were found three (30%) articles, in the year 2014 was located one (10%) article, in 2015 was identified a (10%) article, and in the year of 2016 one (10%). In view of this, it is identified a production prevalence in the year 2013, yet, it was not possible to indicate the reasons for this increase.

In relation to the periodicals in which the articles were published, the *Revista Brasileira de Enfermagem* has three articles (30%), the *Revista Enfermagem UERJ* with two (20%), and the *Revista da Rede de Enfermagem do Nordeste*, *Revista Ciência Cuidado e Saúde*, *Revista Brasileira de Ciências da Saúde*, *Enfermagem Revista*, *Revista Eletrônica Acervo Saúde*, with only one article (10%) in each one, respectively.

In analyzing the titles of the articles were identified thematic that approach biosafety with emphasis on professionals who act directly in the assistance. Faced with this, subtopics were included that contemplated the subject in question, and that can be better visualized in **Figure 1**.

**Figure 1** - Distribution of studies according to the themes



Source: Authors provided data.

When considering the methodological approach used, six qualitative (60%), three (30%) quantitative articles and only one (10%) quantitative-qualitative article was identified. According to the objectives presented in the articles, four (40%) sought to understand and know the nurses' view on biosafety, three (30%) sought to identify and analyze issues involving the occurrence of accidents with biological material, two (20%) describe the social representations of biosafety in nurses' work environments, mainly in primary care, and one (10%) identifies strategies used in continuing education in the prevention of biological hazards.

## DISCUSSION

### Risk factors present in nurses' daily routine

Based on the articles analyzed here, a number of risk factors present in the nurse's work routine were listed, and these are understood as any situation that places the worker in a situation of danger and affects his or her integrity, physical, moral and psychosocial well-being. Among these factors are the scarcity of material resources, lack of staffing, lack of knowledge and training regarding biosafety issues.

Considering the material resources, different authors show that the absence of personal protective equipment such as procedure gloves, masks, glasses, among others, can be considered as causative agents of different occupational hazards to nurses. Furthermore, the fragility in the inspection regarding the use of these equipments, the shortage in the supply of materials to the professionals, they also contribute to the greater incidence of accidents.<sup>3,4,6,8,9,10</sup>

Faced with this problem, a study carried out in the emergency department of a hospital in *Fortaleza* city with

twelve professionals from the nursing team, states that among the strategies for reducing accidents caused by material resources educational practices are developed that highlight the importance of using of Personal Protective Equipment (PPE) and its contribution to and in the context of their work. In the meantime, it is necessary to formalize awareness measures and educational activities directed to the nurse, recognized as important actions in the search for a change in the thinking/acting of professionals and, also, in the control of work accidents.<sup>8</sup>

It is well known that the most effective method for the prevention of occupational hazards that nursing professionals are exposed to is continuing education, because it is believed that the programs and goals to be achieved by health managers and institutions aim, in addition to preservation of the health of its employees the insertion of these in the company's gear as multipliers of knowledge.

With regards to the human resources, it should be noted that nurses' work consists of working hours - often exhaustive - accompanied by overtime and shifts, which contribute to the physical and emotional exhaustion of this professional. Keeping unhealthy habits and routines may influence their cognitive ability, activity performance, material handling, among others, that contribute to the occurrence of accidents in their daily work.<sup>3,5,9,11</sup>

The nurse is exposed to occupational risk factors when providing nursing care in direct care to users, by performing a high number of procedures and therapeutic interventions that require the use of sharps and equipment, increasing the chances of acquiring infections and diseases caused by work-related accidents. On the face of this, it can be inferred that this situation occurs when there is fragility in the orientations

and educational practices directed to professionals, regarding the adequate use of PPE and adoption of biosafety measures.

In line with this idea, different researches report this weakness in the guidelines through the lack of training of the nursing professional, evidencing the lack of continuous education, supervision and the worker's perception of the occupational risk within their work context.<sup>2,5,9,12</sup>

In this context, different studies consider the training as an important strategy of change in face of the risks experienced by the professionals, being able to favor health actions more effective and safe. Corroborating this idea, a research carried out in relation to Biosafety of health workers at the *Hospital das Clínicas Samuel Libânio (HCSL)* points out that the most effective method for the prevention of occupational risks, to which nursing professionals are exposed, is the health education.<sup>5</sup>

Thus, it should be noted that changes in work activities, use of technological resources and continuing education are the best alternative to reduce occupational accidents. Standards and procedures that promote the communication, assessment, treatment, and follow up of occupational accidents should be available to nurses. These standards need to be available in a clear and objective routine in order to minimize cross-contamination and the risk of an accident.

Another point to be highlighted is present in the study conducted in two Adult Intensive Care Units of two mid-sized hospitals in the Northwest region of *Rio Grande do Sul* State in the year of 2012, where the authors affirm that biosafety for nurses represents a challenge, because the longer the professional activity, the greater the risk of exercising their actions automatically/mechanized, exposing their health in activities that until then seemed to be under control. Given that, it is understood that the permanence in an institution for a prolonged period, can develop in the nurse an excess of self-confidence in the performance of their daily activities, making it more susceptible to the occurrence of work accidents by dispensing preventive measures of self-protection.<sup>3</sup>

Given the aforesaid, it is believed that biosafety actions present in the nurses' work setting, need to be anchored in the national biosafety policy in health, which makes it possible to understand that awareness about the problem involving the use of PPE should start from a continuing education with the work team, as well as participation in programs aimed at administrative control by inserting occupational medicine along with the adoption of safety measures and the nursing team as a direct agent in the transformation project.

It is seen in the educational practices an adequate dynamics to be developed with the professionals, because it is a moment in which they can exchange experiences and be active members in the teaching/learning process. The participation of nurses in these practices is essential because they are reproductions of the daily life of professionals and favor reflection and consequently the change of habits, behaviors, and attitudes, where prevention with occupational health is a priority.

## CONCLUSIONS

The use of PPE is the first and most important step for the advancement of significant transformations, both from the individual viewpoint of each professional and from the collective viewpoint with regards to the environment where the professional is inserted.

This study made it possible to know the scientific production about the nurses' perception regarding biosafety. The analysis of the data shows that nurses perceive biosafety as the inclusion of safety measures, as the protagonist of a new structure of prevention and social insertion of nursing, because, it provides to the committed professional the opportunity to experience new perspectives beyond his self-protection.

The nurses' health valorization and their adequate training in prevention and care, being recognized as a multiplier of health actions, are considered indispensable strategies for the good progress of the gear of an institution. These, when motivated workers are indispensable allies to the success of the proposed goals and objectives of any professional sector.

Therefore, it is believed that there is a need for further studies and research, capable of enabling nurses to deepen and better understand biosafety in the context of their work and the development of safer health practices in the hospital setting.

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