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Federal University of Rio de Janeiro State



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## RESEARCH

### Mapa de risco como instrumento para a identificação de riscos ocupacionais: revisão integrativa da literatura

Risk map as an instrument for the identification of occupational hazard: an integrative review of the literature

Mapa de riesgo como instrumento para la identificación de riesgos laborales: una revisión integradora de la literatura

Gicely Regina Sobral da Silva Monteiro <sup>1</sup>, Mirely Eunice Sobral da Silva <sup>2</sup>, Regina Célia de Oliveira <sup>3</sup>

### ABSTRACT

**Objective:** Investigating the available evidences in the literature about the elaborations of risk maps; describing the occupational risks approached in the scientific production and the measures of prevention and protection of workers' health. **Method:** An integrative literature review. Searches were conducted in scientific articles published in the Virtual Health Library (BVS), in the databases LILACS, SciELO and BDNF, selected articles from the last 10 years, in full, in Portuguese, that contains the descriptors and respond to the objective of the study. **Results:** The content thematic analysis identified two categories: Risk Map: definitions and contributions; Measures for prevention of diseases and disorders aimed at promoting the health of professionals, with two subcategories: Hospital Environment and Primary Health Care. **Conclusion:** Mapping is important to facilitate the identification of risks and development of important promotional measures for workers' health. **Descriptors:** Risk Map, Occupational risks, Occupational health.

### RESUMO

**Objetivo:** Investigar as evidências disponíveis na literatura sobre as elaborações de mapa de riscos; descrever os riscos ocupacionais abordados nas produções científicas e as medidas de prevenção e proteção à saúde do trabalhador. **Método:** Revisão de literatura integrativa. Foram realizadas buscas em artigos científicos publicados na Biblioteca Virtual de Saúde (BVS), nas bases de dados LILACS, SCIELO e BDNF, selecionados artigos dos últimos 10 anos, na íntegra, em português, que contivesse os descritores e respondessem ao objetivo do estudo. **Resultados:** A análise temática de conteúdo identificou duas categorias: Mapa de risco: definições e contribuições; Medidas de prevenção às doenças e agravos visando à promoção à saúde dos profissionais, com duas subcategorias: Ambiente Hospitalar e Atenção Primária à Saúde. **Conclusão:** O mapeamento é importante para facilitar a identificação dos riscos e elaboração de medidas de promoção importantes na saúde do trabalhador. **Descritores:** Mapa de risco, Riscos ocupacionais, Saúde do trabalhador.

### RESUMEN

**Objetivo:** Investigar las evidencias disponibles en la literatura acerca de las elaboraciones del mapa de riesgos; describir los riesgos laborales discutidos en las producciones científicas y las medidas de prevención y protección de la salud del trabajador. **Método:** Una revisión integradora de la literatura. Las búsquedas se realizaron en los artículos científicos publicados en la Biblioteca Virtual en Salud (BVS), en las bases de datos LILACS, SciELO y BDNF, artículos seleccionados de los últimos 10 años, en su totalidad, en portugués, que contiene los descriptores y responder al objetivo del estudio. **Resultados:** El análisis temático de contenido identificó dos categorías: Mapa de Riesgos: definiciones y contribuciones; Medidas para la prevención de enfermedades y trastornos destinadas a promover la salud de los profesionales, con dos subcategorías: Entorno hospitalario y de Atención Primaria de Salud. **Conclusión:** El mapeo es importante para facilitar la identificación de riesgos y el desarrollo de acciones de promoción, importantes en la salud del trabajador. **Descriptores:** Mapa de riesgos, Riesgos ocupacionales, Salud ocupacional.

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## INTRODUCTION

The mapping has emerged in Italy, late 60s, early 70s, through the trade union movement, originating in Federazione del Lavoratori Metalmeccanici. In Brazil there are two versions about the introduction of the Risk Map: the first assumes its start with the mapping used by union and academic areas through David Capistrano, Mario Gaawryzewski, Helio Bais Martins Filho and the Inter-Union Department of Studies in Health Working Environment (Diesat) and the second version is attributed to the Foundation Jorge Figueiredo Duplat Safety and Occupational Medicine, in the 80s.<sup>1</sup>

The implementation of the mapping in the health services has become mandatory from Ordinance n° 5 from 17<sup>th</sup> October, 1992, the National Department of Health and Worker Safety, the Ministry of Labor, later amended by Ordinance n° 25 from 29<sup>th</sup> December, 1994, their development is carried out by the Internal Commission for Accident Prevention and is regulated by NR 5 in Annex IV. Occupational hazards are also portrayed in NR 9, they are included in the Program of Environmental Risk Prevention Program (PPRA) and NR 32 which deals with the workers' occupational risks of health institutions.<sup>1-2</sup>

Risk maps are being used to portray the risks that professionals are exposed. Occupational hazards can be determined by a set of individual or institutional conditions that can leave the most vulnerable workers to suffer an accident at work or cause your illness. These may occur during the year of work, the support of employment and the route path, directly or indirectly cause injury, diseases or functional disorders that can cause death, reduction, loss or functional impairment of the ability to perform their work exercise.<sup>3-6</sup>

One way to prevent such accidents is the presence of the Risk Map in the establishment. Its development should be held with the presence of professionals who work in the workplace which facilitates the identification of all environmental risks, provides greater interaction between staff, as well as being a propitious moment for exchanging information and stimulating participation of all in accident prevention actions. The development of this device does not prevent itself accidents at work is necessary the collaboration of health professionals for the use of individual and collective protective equipment that should be part of the professional everyday life.<sup>3</sup>

This study is important as it will help to ensure that health professionals especially the nursing staff identifies through risk map on your desktop which are the occupational hazards they are exposed to and what are the measures of prevention and health promotion that can be used to prevent accidents at work.

As guiding question of the study we can identify: "What are the contributions of risk map on the health of workers in existing literature?" and "What are the measures to health promotion and prevention addressed?"

The aim of the study is to investigating the available evidence in the literature on the elaboration of risk map; describe the occupational risks discussed in the scientific production and the measures of prevention and protection of workers' health.

This theme is relevant and has mainly focused on Occupational Health, as health professionals are exposed to various risks in the workplace, which can cause damage to your health, compromising the quality of care provided to patients and at risk all involved in this work process.

## METHOD

The Integrative Literature Review is a research method that allows the inclusion of experimental or non-experimental studies to facilitate the understanding of the phenomenon studied.<sup>7</sup> This method allows the synthesis of several studies published about a particular issue or topic, systematically and ordered, which helps to deepen the knowledge about a topic, and formulate general conclusions about a particular area of study, since 1980 the integrative review is reported in the literature as a research method.<sup>8-10</sup>

To elaborate this integrative review were outlined the following steps: issue identification and selection of the hypothesis or research questions for the preparation of the integrative review, definition of criteria for inclusion and exclusion of scientific articles and information to be extracted, categorization and evaluation of the studies included in the review, interpretation of results and presentation of the review/ synthesis of knowledge.<sup>8-9</sup>

Initial research without making any filter comprised 3,550 scientific publications (Table 1); the data collection was performed by searching the Virtual Health Library (BVS) in the databases LILACS and BDNF, but also in Scielo using the Map descriptors Risk, Occupational Risks and Occupational Health.

Table 1: Distribution of the bibliographies of individual descriptors for scientific productions published in the databases. Recife, 2013.

Descriptors	LILACS	BDNF	SCIELO
Map of Risk	22	6	75
Occupational Hazards	324	352	125
Workers' Health	1163	842	641
Total	1509	1200	841

Inclusion criteria were: (1) articles included in databases Latin American Literature in Health Sciences (LILACS), SciELO (Scientific Electronic Library Online) and BDNF (Nursing Database), (2) articles with descriptors Risk Map, Occupational Risks and Occupational Health, who later proceeded to the intersection of all descriptors, to complement the

information and seek more targeted articles to answer the central question of the study; (3) articles published in the period 2003-2013. (4) Full-text articles available; (5) research articles, review, reflection and testing; (6) Articles in Portuguese; to facilitate categorization and homogenizing the sample; (7) articles that met the previously defined goal.

After the search of the descriptors alone (Risk Map, Occupational Risks and Occupational Health), were found in the foundations 3.550 scientific publications (Table 1). After considering the inclusion criteria mentioned and realize cross between the descriptors were selected 243 publications (Table 2) that met the established requirements.

Table 2: Distribution of bibliography by descriptors associated with scientific production published in databases from 2003 to 2013. Recife, 2013.

Descriptors	LILACS	BDEFN	SCIELO
Risk Map + Occupational Risk	03	03	1
Risk Map + Occupational Health	03	02	3
Occupational Risks + Occupational Health	86	123	19
Total	92	128	23

To extract the information of the selected articles was built a data collection instrument that addressed the items: author, year of publication, database, and study type, place of publication, objectives, methods and main results. In the assessment of the selected studies full reading of each article was done in order to understand the main issues addressed by the authors. To perform the interpretation of the results, we performed comparative reading between the articles (vertical scanning) for the construction of the key operated axes.

Due to the large number of scientific articles found there was a need to refine the data through a selective reading of the literature. To facilitate the issue of specificity, use the associated descriptors, after this step, the articles were selected full texts available in Portuguese, the last 10 years. Focus with articles were excluded only on occupational diseases; those who were outside the defined period, were not available in full text format, repeated, and theses and dissertations in order to homogenize the sample, who had no contributions to achieve the objectives of Integrative Review of Literature and fleeing the theme research.

After the filter was carried out selection of items, totaled 20 (Table 3). The comparative reading (vertical reading) is extremely important because it facilitates the choice of the specific items for the issue at hand to answer the guiding question.

Table 3: Potential bibliography in numbers based on data from 2003 to 2013. Recife, 2013.

Descriptors	LILACS	BDEFN	SCIELO
Risk Map + Occupational	02	01	0

Risk			
Risk Map + Occupational Health	02	0	0
Occupational Risks + Occupational Health	04	06	05
Total	08	07	05

After exploratory reading the articles were selected through an analytical reading noting the contribution of each research for this study. There was the conduction of separation of texts by encoding and categorization and at the end held an interpretive reading, co-relate the statements of the authors with the research objectives.<sup>11</sup>

The technique used for the distribution and understanding of the data was a content analysis in order to support the development of the following categories: Risk Map and its definitions and contributions to identify environmental risks and promotion measures and protecting the health of workers, the subjects were divided into two sub categories: Hospital Environment and Primary Health Care, from the 20 items used in the current review.

## RESULTS E DISCUSSION

### Map of risk: its definitions and contributions to identify environmental risks

In this current category were selected 14 articles, two of which portray the definition of risk map and 12, the risks identified in the professional environment.

Table 4: Articles addressing definitions of risk map published in 2003 to June 2013. Recife, 2013.

Author	Year of publication	Database/ Type/Place	Title
METELLO, F.C.; VALENTE, G. S. C. <sup>11</sup>	2012	BDENF/Article/ Basic Care Magazine Online	The importance of biosecurity measures as work accident prevention through the identification of biological risks in the risk map.
HÖKERBERG, Y. H. M. et al. <sup>12</sup>	2006	SciELO/Article/ Science and Collective Health	The process of building risk maps in a public hospital.

The risk map is defined by the authors as a descriptive and qualitative methodology of territorial risk research. In Brazil the mapping begins to spread from the 80s and was used as order to study the working conditions and incorporate the political dimension worker action in defense of their rights, with basis in the Workers' Italian model.<sup>11-2</sup>

It is of utmost importance to identify risks through maps is a tool that facilitates the identification of occupational hazards. It also offers subsidies to assess the risks and the potential damage to health caused by exposure to environmental agents, makes easier the control, identification of exposure to these risks. In addition to gathering information relevant to establish the diagnosis of the security situation and health of workers.<sup>11</sup>

By mapping you can collect the most information about the risks that professionals are exposed with the help of employee participation.<sup>11</sup>

The main risks identified by the articles were the biological, chemical, physical, ergonomic, psychological and accidents.

Only one article classifies risks on the map through the NR-5 standards, identifying colors for each risk: Biological hazards (caramel), chemical hazards (red), physical risk (green), ergonomic hazards (yellow), Accident Risk (black), not including psychological risks. Only one article reports the classification of the risk map in color.<sup>11</sup>

Table 5: Distribution of articles with identification of occupational hazards in the hospital area and on primary health care published from 2003 to June 2013. Recife, 2013.

Author	Year of publication	Database/ Type/Place	Title
ALMEIDA, A. N. G, et al. <sup>2</sup>	2008	Scielo/Article/UERJ Nursing Magazine	Biological risk among nursing workers
SILVA, L. S. <sup>3</sup>	2012	Scielo/Article/Online Research Magazine Care	Hospital chemical risks and management of harms to the health of the nursing professional
SANTOS, J. L. G, et AL. <sup>4</sup>	2012	Scielo/Article/Gaúcha Nursing Magazine	Risk and vulnerability in the practices of health professionals
VIEIRA, M.; PADILHA, M. I. C. S. <sup>6</sup>	2008	BDEFN/Article/USP School of Nursing Magazine	HIV and nursing worker facing the accident with bladed cutting material
SILVA, M. K. D.; ZEITOUNE, R. C. G <sup>14</sup>	2009	Lilacs/Article/Anna Nery School of Nursing Magazine	Occupational hazards in a haemodialysis sector from the perspective of the employees of the nursing staff
FIGUEIREDO, R. M.; MAROLDI, M. A. C. <sup>15</sup>	2012	BDEFN/Article/USP School of Nursing Magazine	Domiciliary hospitalization: risk of biological exposure to the health team

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CASTRO, M. R.; FARIAS, S. N. p. <sup>16</sup>	2008	BDEFN/Article/Anna Nery School of Nursing Magazine	The scientific literature on occupational hazards that are exposed to nursing workers
DALRI, R. C. M. B.; ROBAZZI, M. L. C. C.; SILVA, L. A. <sup>17</sup>	2010	BDEFN/Article/Nursing Science	Occupational hazards and health changes among Brazilian nursing workers of urgency and emergency units
MAURO, M. Y. C., et AL. <sup>18</sup>	2010	BDEFN/ Article / Anna Nery School of Nursing Magazine	Occupational hazards of nurses working in the Family Health Strategy
BESSA, M. E. p. <sup>23</sup>	2010	Lilacs/Article/UERJ Nursing Magazine	Occupational hazards of nurses working in the family health strategy
NASCIMENTO, G. M. I.; David, H. M.; S. L. <sup>24</sup>	2008	Scielo/Article/UERJ Nursing Magazine	Risk assessment in the work of Community Health Agents: a participatory process
DAVID, H. M. S. L., et AL. <sup>25</sup>	2009	BDEFN/Article/Text Context Nursing	Organization of the work of nursing in primary health care: a matter for worker's health

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On the importance of mapping in health services even with a few articles addressing this subject, we can confirm that the Risk Map is a tool that facilitates the identification of chemical, physical, biological, psychosocial and ergonomic which health workers are exposed . Noteworthy is its relevance to the Workers' Health Surveillance, used as an educational process that favors the construction of new pipelines in the workplace. They should be placed in easily accessible places, for easy viewing by professionals in order to promote collective awareness.<sup>11</sup>

Authors define the risk map as a graphical representation of the factors that are present in the workplace that can cause damage to the health of workers. The factors may originate from the elements that are present in the environment, as materials, equipment, facilities and supplies, present in workspaces where the changes occur, they are also related to the way of organizing work their physical arrangement, rhythm, method, shifts and working posture.<sup>1</sup>

To support action planning and control of health in the workplace is required valuing prior knowledge and experience of workers, raise the information by homogeneous groups of workers and validate the information.<sup>12</sup> These requirements facilitate the preparation of the Risk Map it centralizes employee participation in its elaboration and encourages thinking together on environmental risk prevention measures, according to these authors Article unites risk map and risk prevention is part of the current review of two categories.<sup>11</sup>

Only one article questions the methodology of preparation of risk maps. It states that the "knowledge of the worker" based on its own logic, cannot exceed the "technical



knowledge" that is scientific, the particular knowledge based on professional experience; it does not allow to generalize about the working conditions of a group.<sup>12</sup> What disagree with this statement is that the workers and scientific knowledge can come together to provide a more solid knowledge about the subject and there is no hierarchy between them and resulting in information relevant to the preparation of mapping.

### **Hospital Environment**

#### **Biological Risk**

The biological risk is very common in the daily lives of health workers, lead contamination risks for the professional and transmission agents for patients and can cause infectious diseases transmitted by transcutaneous exposure. Hepatitis B is listed as a higher risk of disease, as well as contact with blood derivatives, excretions and secretions, body fluids and tissue fragments.<sup>2,12-4</sup>

The realization of common procedures in the hospital: peripheral venipuncture, fogging for induced sputum, cerebrospinal fluid examination, biopsy, processing of laboratory tests, intravenous medication administration, aspiration, exchange tracheostomy tube, urinary catheter, and nasogastric tube administration of drugs, can be a means of transmission.<sup>15</sup> as well as the contact with infectious diseases such as HIV and Hepatitis B hepatitis C, amount of Personal Protective Equipment (PPE) insufficient sterilization of surgical materials and various instruments.<sup>12-3,16-9</sup>

Authors state that occupational accidents with biological materials are related to the handling of needles and intravenous catheter.<sup>3,6,14,20</sup> Vieira prepares a literature review that addresses the exposure to biological hazards and accidents at work of nursing professionals with biological materials, resulting in HIV infection.<sup>6</sup>

Health professionals are also subject to risks when dealing with patient care, articles reports that child care agitated carriers of the HIV virus or infectious lung diseases, as well as the effort to position them at the time of the tests which increase exposure to risk of contamination.<sup>12,21</sup> Another study says that patients without definite diagnosis can lead to risks of biological accidents.<sup>17</sup>

The realization of hygiene of patients and the environment as insufficient cleanliness of the toilets, air conditioning and the environment, are also major risk factors, as well as the air like pathogen transmission vehicle was cited in research.<sup>13,17,22</sup>

Two articles report the risk of biological contamination in health professionals working in laboratories: contamination by pathogens through contact or risk falling bottles, glasses and other contaminated materials.<sup>11,22</sup>

Several articles report on the biological risks to health professionals, but few studies claim that accidents with sharp punch, needles and blades, are common among health professionals such as doctors, nurses and nursing technicians.

### **Primary Health Care**

Only two articles portray the issue of biological risks in the context of primary care, the main risks cited are: parenteral contamination when administering vaccine contamination by HIV, Hepatitis B and Hepatitis C. The contact with vaginal secretion

during the course of Pap smears, secretions from wounds and the risk for is in contact with patients with frequent contagious infectious disease in the community, such as tuberculosis, viruses, parasites, lice and scabies.<sup>23-4</sup>

The Community Health Agents are also subject to risks due to exposure to people with communicable diseases, mainly respiratory tract such as untreated tuberculosis, exposure to dengue mosquito outbreaks, direct contact with people with infestation by lice and fungal infections, generating situations of great risk of occupational illness.<sup>25</sup>

#### **Chemical risks**

##### **Hospital environment**

Chemical risks are related to poor physical infrastructure and packaging and inadequate management of chemicals (hematoxylin used in resistant bacilli detection technique alcohol acid) in Pathology sector, such as the presence of developers and fixers in the radiology sector are causing occupational diseases.<sup>12</sup>

Another potential chemical risk source are the drugs used in the Day Hospital in hospitalization, oxygen and nitrogen in Hospital sector.<sup>12</sup> Exposure to chemotherapy, antineoplastic drugs offers risks to the health worker to handle and administer medicines.<sup>21</sup> Other authors cite risks with exposure to antibiotics.<sup>16-8</sup>

Toxic products for cleaning and disinfection, such as detergents and disinfectants used for cleaning all hospital.<sup>12,17</sup> The handling of other chemicals such as sodium hypochlorite at 2% and proxitane, which are used for disinfection of Hemodialysis machines, sterilization of dialyzers patients.<sup>3,14,17</sup> The handling of anesthetic agents, sterilants and irritating to skin or inhalation of these chemicals, both by gravity and by the frequency of use and concentration (formaldehyde and xylene) are other examples in the literature about chemical hazards.<sup>21-2</sup>

##### **Primary Health Care**

The chemical handling during drug administration may create a risk of allergic sensitivity or until tumors. Other chemical hazards that can be found in Basic Health Units are present in the gloves of procedures, sodium hypochlorite to carry out health education for the population, iodine and ether used in clinical curative.<sup>23</sup>

The Community Health Agents are subject to exposure of dust from unpaved streets, inhaling exhaust fumes of cars and cigarettes, during home visits people smoking, constitute chemical hazards that are exposed ACS.<sup>24</sup>

Authors realize that the production of research related to chemical hazards is lagged, which contributes to the lack of information necessary scientific and materials that contribute to the learning of employees.<sup>3</sup>

#### **Physical risks**

##### **Hospital environment**

Electrical risks were cited, ionizing radiation during exams that patients undergo or during the X-ray of patients in bed, unstable or high temperature and little air circulation.<sup>3, 13, 17-8, 21</sup>

The noise from the reception of patients room, alarm equipment without preventive maintenance, bells, doors, transport carts wheels, lighting the ultraviolet lamps in respiratory isolation wards and autopsy room, were also cited.<sup>3,17-8</sup>

The repetitive physical effort reported by nursing staff, to assist in the transport of patients with physical disabilities and carry out further clinical trials at the Clinic, characterizes physical risk.<sup>17</sup>

In the fields of Pathology and Radiology, the risk was related to the handling of large containers containing chemical solutions, the temperature in these environments according to another study was in accordance with the requirements of NR 15 less than 30°C, the lighting was not according the which causes more eyestrain and fatigue in workers, increasing the risk of accidents. The sound pressure was also adequate, below 85 dB for 8 hours of work, according to NR-15 the maximum on-site was 75.7 dB. It is also reported on the unequal distribution of physical space, organization and insufficient cleaning.<sup>17-8,22</sup>

#### **Primary Health Care**

Poor lighting makes it difficult consultations and exams like pap smear, and that some health facilities is inadequate electrical installations and the lack of ventilation in offices.<sup>23</sup>

The ACS are exposed to sunlight during home visits, moisture in periods of rains and humid places near rivers.<sup>24</sup>

Authors state that despite its relevance physical risks are few discussed in the literature and the nature of psychosocial factors is complex and involves issues relating to the individual (personality), work environment (demands and control over the task) and social environment (factors cultural).<sup>22</sup>

The early identification of occupational hazards, is an excellent measure of prevention of diseases and work-related accidents, enable the reduction of the occurrence of accidents and injuries.<sup>3</sup>

#### **Psychological risks**

##### **Hospital Environment**

Professionals are subject to aggression, insecurity, overwork, stressful environment, arrogant posture of patients and caregivers, stress, depression, anxiety and may result in mental and behavioral disorders such as sleep disorder.<sup>16-7</sup>

Psychological risks were also cited a few, even though illnesses generators, psychological risks, pain and death have always been taxable events conflicts, psychological factors emotionally harm professionals leaving them less able to carry out their work.<sup>21</sup>

##### **Primary Health Care**

Some stressors are: the strict control of time to make their activities; how the environment is organized, lack of materials and devices, conflicts in relationships between team members, double shifts (also a result of poor remuneration) and work on weekends and holidays from late (due to double shift).<sup>23</sup>

Pain and death can also cause psychological conflicts to health professionals especially when dealing with children with infectious diseases, low socioeconomic income and for broken homes, these workers live with this reality.<sup>21</sup>

Some health workers can work in neighboring municipalities in such cases they spend the week at work, getting away from the family and its social cycle. The pressures arising from the professional managers and patients, who do not understand this new proposal for

health care and still prefer the curative models to the preventive approach. Contact with the suffering and the critical state of health of the patient can also generate psychological illness.<sup>23</sup>

The ACS (Community Health Agent) suffers psychically with the productivity requirement, the inclusion of behaviors that were not within its competence, the workload of tasks, to wear with users when they cannot be resolute when or rely on other professionals to end or referrals their conduct. What leads a monotonous and repetitive work, which affects the mental condition of that worker, causing dissatisfaction and discouragement.<sup>24</sup>

The process of social affirmation by being a recent professional category, the impact of the lack of recognition of their work and the rebate because they cannot work effectively in improving the quality of life of users, also results in psychological stress, these are psychological risks reported by ACS. In addition to being residents of the community in which they work, they are often asked during periods outside their working hours, at night in cases that residents consider urgent, on weekends and even holidays. Another problem encountered is the monthly income that is not compatible with what they want.<sup>24</sup>

#### **Ergonomic factors**

##### **Hospital Environment**

Inadequate furniture such as workbenches of light and dark chambers of laboratories, long length of stay seated in the stands and tables, very high stretchers and inadequate physical infra-structure are reported.<sup>12,14,16-7,22</sup>

The patient care also generate risks as not ergonomic postures, repetitive physical effort, automatic attitude, excessive risk during the proceedings and the risk of falls.<sup>13-4, 16-8, 23</sup>

These excessive risk may contribute to the osteoarticular incidence disorders, back pain, dorsal, shoulders and neck, causing long-term deformation of the spine and joint problems such as tendonitis, bursitis, or even irritation and stress. All these factors can contribute to the emergence of Injury Repetitive Strain (RSI) and Work-Related Musculoskeletal Disorders (MSDs).<sup>16,18,22-3</sup>

##### **Primary Health Care**

One of the main ergonomic problems is related to the furniture: tables and chairs for outpatient care are inadequate for use for a long period of consultations. Even that nurses engage in other activities, such as service groups and home visits, these professionals spend most of their time performing outpatient activities.<sup>23</sup>

Regarding the ergonomic risks and accidents was noticed by researchers to little presence in the studied scientific papers and those with this type of risk, now classified as physical harm or as ergonomic.

##### **Risk of Accidents**

##### **Hospital Environment**

Health care workers are exposed to accidents resulting from the use of sharp piercing equipment (needles, scalpel blades, glass works, microtome), lighting and inadequate or insufficient physical structure, inappropriate storage of chemical substances and sera, outdated equipment and lack of preventive maintenance.<sup>12-3,23</sup>

The erroneous disposal and waste treatment and the wet ground, have been identified as potential contributors to the occurrence of accidents.<sup>12-13</sup>

The risks of burns, electric shock, fire and explosions, especially in the areas of hospitalization, Pathology and Bacteriology were also cited.<sup>13</sup>

Study on radiology professionals during the course of their duties are exposed to accompany patients in this study are children with neuropathies and need to be well positioned to take the examination. At that point the professionals are exposed to ionizing radiation because the apron with lead is not enough to protect them fully.<sup>21</sup>

#### Primary Health Care

These professionals may also suffer accidents with cutting punch material, to perform procedures such as vaccines, injection and withdrawal points.<sup>23</sup>

Other reported risk was the path of an accident, by moving daily to the district in which they work for short signposted roads, some have employment according to the Labor Code, not having the rights recognized in cases of accidents, making a major risk factor for nurses working in the Family Health Strategy.<sup>25</sup>

The ACS are exposed to risk of accidents when driving on narrow sidewalks and unprotected, to visit houses built in areas at risk of landslides, areas with no pavement or in areas with vegetation, with damp and slippery access, which expose the ACS falls.<sup>24</sup>

A lot of stairs, often with sewage running ditch in the open, presence of electrical wires in the passages, with risk of electric shock, dogs loose on the streets and communities, bites risks by snakes and other venomous animals and are working in the area of urban violence, all these risks were identified.<sup>25</sup>

The risks of accidents portrayed were well represented in the studied literature, correlating the cause and effect of the risks.

#### Measures to prevent diseases and worsening related to occupational hazards in order to promote the health of professionals

Table 6: Publications portraying promotion measures for occupational health and accident prevention, from 2003 to June 2013. Recife, 2013.

Author	Year of publication	Database/ Type/Place	Title
MIRANDA, F. M. D., et AL. <sup>19</sup>	2011	BDENF/Article/USP Nursing Magazine	A contribution to the health of workers: a guide on exposure to biological fluids
ALVES, S. S. M.; PASSOS, J. P.; TOCANTINS, F. R. <sup>20</sup>	2009	Lilacs/Article/UERJ Nursing Magazine	Accidents with sharp bladed on nursing workers: a matter of biosecurity

OLIVEIRA, A. C. D.; PISCOYA, M. E.; TOLEDO, A. D. <sup>26</sup>	2010	Lilacs/Article/Science, Care and Health	Accidents at work with bladed sharp materials among the multidisciplinary team of an emergency unit
FERNANDES, G.S.; CARVALHO, A.C.P.; AZEVEDO, A.C.P. <sup>22</sup>	2005	Lilacs/Article/Brazilian Radiology	Evaluation of occupational hazards of workers of Radiology
FRANQUILIN, S. L.; et al. <sup>23</sup>	2009	Lilacs/Article/Brazilian Journal of Laboratory Medical Pathology	Assessment of environmental conditions in the laboratory of pathological anatomy of a university hospital in the city of Rio de Janeiro
METELLO, F.C.; VALENTE, G. S. C. <sup>11</sup>	2012	BDENF/Article/Online Basic Care Magazine	The importance of biosecurity measures as work accident prevention through the identification of biological risks in the risk map

The measures to promote health and prevention of accidents appear in a few articles, they found, claim that can be used to minimize the risk that professionals are exposed and possibly cause illness. Safety and security measures are forms of prevention must be used in the care of all patients.<sup>14</sup>

Accident prevention measures addressed in the articles were: Biosecurity, which arises through the World Health Organization by means of preventive recommendations for biological, environmental control and public health laboratories working process.<sup>11</sup> These measures encouraged the authors mainly for health professionals, Viera in his study highlights the nursing staff because during the practice of caring and for being the professionals who spend most time with the patient and are responsible for implementing procedures and have contact with biological material should make use of the biosafety.<sup>6</sup>

The accession of Personal Protective Equipment (PPE) were cited in eleven (11) items, report the importance of the proper use during exercise specific work of each profession, they are the best way to prevent accidents and exposure to occupational hazards related to biological factors, as they help to avoid contact with body fluids, the PPE cited were: gloves, apron, mask and eye protection when coming into contact with infected patient body fluids or not.<sup>2-3,6,11,13-14,18,20,22-23,26</sup>

Another research by a collective discussion on the occupational hazards included strategies of how to prevent them: As for the chemicals could be correctly identified and stored with chips mismatch on guidelines and safe handling of potentially toxic substances and guidance procedures to be adopted in case of accidents and/or poisoning. Also suggests the development and dissemination of standards for the transport of biological materials and chemicals.<sup>12</sup>

The expansion of the physical area of the hospital or unit of work environments, by creating some new areas to purge, washing and sterilization of material, waste storage and treatment of sewage, the need to improve the circulation areas and flows of the labor process, and the correct signaling of risks as well as the construction of dining halls and locations for the rest of the workers or the correction of inadequate physical infrastructure of the workplace can be used to prevent accidents.<sup>11-2</sup>

Other authors report the importance of regular preventive maintenance program of equipment.<sup>12</sup> non-slip floor insertion, presence of cutting punch box on all beds, improving lighting, cleaning the toilets, ventilation and cleaning of air conditioning, and perform tests periodicals for workers and replace inappropriate equipment and real estate.<sup>13</sup>

A guide on biological hazards was prepared in a job and that health professionals are exposed reports preventive measures freight biological exposure, proper use of cutting punch and not recapping needles and their Disposal of these materials in an appropriate place.<sup>18</sup> The importance of hand washing before and after the procedures, use of EPIS properly, use collateral as kidney bowl and tray during any invasive procedure for placing cutting punch material, are also ways to prevent accidents.<sup>11-9</sup>

Measures to promote the health of the workers reported in the articles were: continuing education program is essential for health professionals who work directly or indirectly with patients and their immunobiologicals. During the lectures it can be addressed questions about exposure to biological hazards, industrial accidents, warn about the importance of using standard precautionary and biosecurity standards.<sup>11,13</sup>

Lifelong learning is also portrayed as a way to foster the acquisition of knowledge, so that health professionals establish and adopt preventive measures to reduce the risks of biological accidents in the hospital environment and in order to encourage professionals to reflect about his work practice and the responsibility before you and the patient, besides being used for staff training.<sup>11-13</sup>

Immunization was also cited by the authors, vaccination against hepatitis B because some studies report that professionals who have suffered occupational accidents with the virus, did not have the full vaccination schedule, highlight the need for continuing education that promotes guidance on the importance of immunity to protection from disease and reinforce the need for the Anti HBs after vaccination.<sup>11</sup>

Guidance on notifications related to accidents at work and the importance of medical care within 2 hours after the accident, in order to increase the information regarding the standard precautions aimed at preventing and occupational exposure to Hepatitis B, Hepatitis C and HIV, reinforce the importance of completing the Work Accident Communication (CAT), they can be addressed in continuing education.<sup>11</sup>

#### **Primary Health Care**

Only one author expresses his opinion about the reality of professionals from centers and health posts, health units of Family and Community Health Agent Program says that the responsibility for prevention and control of occupational accidents, the Health System. What shall draw up a public health policy focused on employee health with a set of actions which ensure the quality of life and decent working conditions for health professionals.<sup>24</sup>

With regard to disease prevention and health promotion articles assert its importance as a way to guide the respect of occupational hazards and how to avoid them, through health education, but a limitation of the study was that in no article deals with these The major focus of the work, they are often presented in the form of conclusion as recommendations to avoid the risks found in the search.

The recognition of workers' rights as greater knowledge about occupational hazards, based on solid statistical studies, better working conditions, good safety and occupational health, proper working hours, establish subsidies for workers and employers comply with existing norms, described in Regulatory Standard 32 were cited by only two (2) items, which should in more scientific production, so that health workers could claim their rights.<sup>17, 23-4</sup>

## CONCLUSION

The risk category map: its definitions and contributions to identify environmental risks, highlighted the concept of mapping that is present in a few articles that affirm the importance of its completion, to facilitating the identification of occupational hazards, it is a tool that aware professionals and leave them more vigilant to exposures that are subject in their work environment. Their participation in the preparation of the Risk map generates a time to disseminate knowledge and stimulate discussion on ways to accident prevention and health promotion.

The integrative literature review provided the identification of occupational risks that are closest to the literature, in hospitals and in primary care: chemical, physical, biological, ergonomic, psychological and accident and how the authors address the issue, and portray which health professionals are more likely to occupational risks. But of course there are few publications available on this topic in Primary Health Care.

The category measures for the prevention of diseases and disorders related to occupational hazards aimed at promoting the health of workers, provided the understanding of measures for health promotion and prevention, which are important to prevent diseases or occupational accidents, but was not the main theme none of the 20 articles.

We suggest that from this study are carried out new research related to the themes: Risk Map and its contributions to the Occupational Health, for being an extremely important theme for health professionals, especially to the nursing staff, which is subject to work accident, in addition to using continuing education for the prevention and management of health risks.



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