ABSTRACT

Objective: to identify in scientific productions the occupational risks that nurses are exposed in the workplace and associate them to cancer. Method: an integrative review, with the research question << What are the occupational risks and their association with cancer in nurses? >>. Data were collected in the virtual library SciELO Brazil, in June 2012, selected 18 scientific works. The critical analysis of the studies was done by means of thematic content analysis of Laurence Bardin. Results: The nurses are exposed to biological, chemical, ergonomic, psychological and physical risks in the workplace. The cancer is associated to chemical, biological, physical and ergonomic risks, and highlighted the breast cancer, liver, skin and leukemia. Conclusion: It is necessary to adopt precautionary measures; permanent and continuous education and public policies that aim better working conditions. Descriptors: Nursing; Neoplasms; Occupational Risks.

INTEGRATIVA REVIEW ARTICLE

OCCUPATIONAL RISKS AND CANCER IN NURSING PROFESSIONALS: AN INTEGRATIVE REVIEW

RISCOS OCUPACIONAIS E O CÂNCER EM PROFISSIONAIS DE ENFERMAGEM: UMA REVISÃO INTEGRATIVA

RIESGOS OCUPACIONALES Y CÁNCER EN PROFESIONALES DE ENFERMERÍA: UNA REVISIÓN INTEGRADORA

Técia Maria Santos Carneiro e Cordeiro

RESUMO

Objetivo: identificar nas produções científicas os riscos ocupacionais que os profissionais de enfermagem estão expostos no ambiente laboral e associá-los ao câncer. Método: revisão integrativa, com a questão de pesquisa << Quais os riscos ocupacionais e sua associação com o câncer em profissionais de enfermagem? >>. Os dados foram coletados na biblioteca virtual SciELO Brasil, em junho de 2012, selecionadas 18 produções científicas. A análise crítica dos estudos foi feita por meio da análise de conteúdo temática de Laurence Bardin. Resultados: os profissionais de enfermagem são expostos a riscos biológicos, químicos, ergonômicos, psíquicos e físicos no ambiente laboral. O câncer está associado aos riscos químicos, biológicos, físicos e ergonômicos, e em destaque o câncer de mama, de fígado, de pele e leucemia. Conclusão: é necessária a adoção de medidas de precaução, educação permanente e contínua e políticas públicas que visem melhores condições laborais. Descriptors: Enfermagem; Neoplasias; Riscos Ocupacionais.

RESUMEN

Objetivo: identificar en las producciones científicas los riesgos laborales a que los profesionales de enfermería están expuestos en el lugar de trabajo y asociar los al cáncer. Método: revisión integradora, con la pregunta de investigación << ¿Cuáles son los riesgos laborales y su asociación con el cáncer en los profesionales de enfermería? >>. Los datos fueron recolectados en la biblioteca virtual SciELO Brasil, en junio de 2012, y seleccionados 18 trabajos científicos. El análisis crítico de los estudios se realizó mediante el análisis de contenido temático de Laurence Bardin. Resultados: los profesionales de enfermería están expuestos a riesgos biológicos, químicos, ergonómicos, psicológicos y físicos en el lugar de trabajo. El cáncer se asocia a los riesgos químicos, biológicos, físicos y ergonómicos, y resaltado el cáncer de mama, de hígado, de la piel y leucemia. Conclusión: es necesario adoptar medidas cautelares, la educación permanente y continua y las políticas públicas que visen las mejores condiciones de trabajo. Descriptors: Enfermería; Neoplasias; Riesgos Laborales.
INTRODUCTION

Occupational risk is the probability of a change in physical or mental health worker in the development of work activities and exposures to risk factors. Exposures to risk factors for health care workers have been emphasized since the seventeenth century, when there was a concern with the midwives had dermatitis. From this period, the Ministry of Labor consolidated Labor Law through Decree 3214 of June 8, 1978 with the approval of the Regulatory Standards (NR) that provide subsidies to medicine and safety, as well as legal and technical support activities labor.1

The NR - 9 considers environmental risks, physical agents, chemical and biological existing work environments, which depending on their nature, concentration or intensity and exposure time are capable of causing damage to workers' health.2 There are also ergonomic risks and psychics were not included in the NR.

The activities performed by nursing professionals put them at risk all the time by working conditions inherent in the profession and enforced in the workplace. Occupational hazards of nursing are classified as: 1

- Physical Hazards: related to exposure to biological materials such as body fluids, secretions, blood, CSF, among others.
  - Physical Risks: from exposure to changes in temperature, humidity, ionizing and non-ionizing radiation and noise.
  - Ergonomic Risk: related to activities with repetitive motions, awkward positions, and use of non-ergonomic chairs, manual lifting and carrying weight, night work and monotony.
  - Risks Psychic: resulting from overwork, low pay, stress, fatigue, double shifts, lack of leisure and permanent contact with suffering.
  - Chemical Hazards: from substances, products or compunds able to penetrate the body through the respiratory, digestive and skin.

Occupational hazards expose nurses to work-related illnesses, which can be classified in two ways: the disease occupational / professional is when the work is the necessary cause of disease, and work-related illness is as a risk factor increases the likelihood of developing the disease. Most cancers are considered a work-related illness.3

Cancer is a genetic disease process begins with damage to a gene or group of genes in a cell and progresses when all the mechanisms of the immune system repair or cell destruction fail. And occupational cancer can be defined as one caused by exposure during working life to carcinogens present in work environments. Researchers suggest that 2% to 4% of all cancers can is associated with exposures in the working environments.4

The development of cancer is called carcinogenesis and oncogenesis, a highly complex process which involved risk factors inherited and environmental risk factors, such as diet, smoking, occupation and exposure to radiation and chemicals. Carcinogenesis can be triggered by physical, biological and chemical.3

The process of carcinogenesis consists of three stages: initiation, which leads to damage to genetic mutations and deletions, promotion, which is the proliferation of cells “opened” and the progression involving the conversion of benign precancerous lesions in neoplastic cancer.5

Cancers related to work have been poorly dimensioned the dearth of research in the country. When compared to other risk factors, the occupation is not well emphasized even when the risk is well known and documented, as is the case with asbestos cancers, benzene, ionizing radiation, among others.4,6 Studies on cancers related to nursing professionals are scarce in Brazil and little known. The relationship between occupational hazards and cancer has been little discussed in recent years, which opposes the situation growing cancer.

It is evident that one of the consequences in which work-related diseases, such as cancer, cause health worker absenteeism of nursing is the absence from work for reasons related to work activities. The absentee rate for nurses is high; it reaches 42.8% and ideally up to 20%, considering an issue of concern to characterize the illness of nursing professionals.5

Therefore, this study aims to identify the scientific productions occupational hazards that nurses are exposed in the workplace and associate them to cancer.

METHOD

Integrative review of broad methodological approach concerning revisions, combining bibliographic data and incorporates definitions of concepts, revisions and evidence of a relevant issue in particular.

Followed by the six stages of the integrative review,6 was drafted in the first question: What are the occupational hazards and their association with cancer in nurses?

In the second phase took place the pursuit of scientific production in database SciELO...
Brazil, in June 2012 used the descriptors and synonyms: "occupational hazards", "cancer" and "nursing". With the inclusion criteria: articles published from January 2002 to May 2012, with nurses as subjects of study, and published in full in English or Portuguese. The scientific production were identified by reading the titles and abstracts, excluding those that did not meet the inclusion criteria, totaling documentary corpus of this study of 18 scientific works.

Data collection took place in the third stage by identifying the relevant aspects: characteristics of scientific production (language, publication period, area of research, the locus of research, methods of research and periodic publication), and content relevant to answer the research question.

In the fourth phase of the review of the studies included in the research were made by means of thematic content analysis Laurence Bardin that allows us to categorize and present the data graphically with words, sentences or summaries. We used a qualitative approach and quantitative contribution to the descriptive statistics presenting data in graphs and tables.

The fifth and sixth phase refers to the association between the results of the discussions and the presentation of the integrative review, are presented in three categories: 1-Corpus documentary; 2-Occupational hazards in which nurses are exposed; 3-Cancer its relation to occupational hazards among nursing.

### RESULTS AND DISCUSSION

- **Documentary corpus**

  We analyzed 18 (100%) scientific articles, 89% in Portuguese and in English 11%; 100% approach the thematic about the occupational risks related to cancer or not.

![Figure 1. Period of publication of scientific works.](image)

The period of publication of scientific works of the highest prevalence was between 2005-2008 (45%), with no growth in recent years, requiring greater investments in research on the subject by a problem of Occupational Health coverage in Health public (Figure 1).

As for the area of research stands out with 94% nursing and multidisciplinary team only 6%, a statistic expected by professionals are interested mostly in topics related to their profession and or area.
The quantitative approach (55%) stood out among the scientific production in the study according to figure 2, which shows the interest in measuring occupational hazards of nursing, but could also invest in qualitative studies / combined quantitative way beyond measure also analyze the perceptions of these nurses.

Observe that the state as the locus of the studies highlighted was that of São Paulo (55%), half of the scientific production (Figure 3). For regions draws attention to the worst situation in the North with no publication on this theme, followed by the Midwest (6%) and South (6%). The region with the highest publication is the Southeast (72%), followed by the Northeast (16%), so it is necessary to research and publications in these areas highlighted with the absence or low percentage of publications to verify the occupational hazards that nurses are exposed and working conditions in these locations.
Figure 4. Periodic publications of scientific works.

The scientific works were published mostly in journals in the nursing field as shown in figure 4, highlighted the Latin American Nursing Magazine, with 38% of the production in study. There are necessary publications in other journals such as Public Health and Public Health, a health worker to be an issue of Global Health.

- Occupational risks in which nurses are exposed

Occupational risks identified in scientific productions that nursing professionals (nurses, technicians and nursing assistants) are exposed, can be verified in Figure 5:

<table>
<thead>
<tr>
<th>Risk groups</th>
<th>Existent risks in work environments</th>
<th>Number of scientific productions</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological risks</td>
<td>- Contact with sharps, contaminated materials, blood, urine, secretions, body fluids;</td>
<td>12</td>
<td>66%</td>
</tr>
<tr>
<td></td>
<td>- Contact with patients with contagious diseases; HIV, hepatitis B and C, tuberculosis.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical risks</td>
<td>- Ionizing radiation (x-ray);</td>
<td>4</td>
<td>22%</td>
</tr>
<tr>
<td></td>
<td>- Electric shocks;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Sudden changes of temperatures;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Noise, poor lighting, inadequate physical space, insufficient cleaning; slippery slope-fall.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical risks</td>
<td>- Medicines, solutions, disinfectants, sterilising chemotherapy, gases, anesthetics, antibiotics,</td>
<td>11</td>
<td>61%</td>
</tr>
<tr>
<td></td>
<td>ethylene oxide, nitrous oxide, glutaraldehyde, ether, benzene, iodine, latex/talc, antiseptics,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>sodium hypochlorite 2%.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ergonomic risks</td>
<td>- Inappropriate and uncomfortable postures, repetitive motion, fast-paced, physical exertion,</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td></td>
<td>standing work, weight lifting and transport;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Different work shifts and night shift; low back pain, RSI/WMD.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychic risks</td>
<td>- Stress, fatigue, tension, fast-paced, harrowing situations, unfair wages.</td>
<td>6</td>
<td>33%</td>
</tr>
<tr>
<td>Other risks</td>
<td>- Violence, discrimination, war, fire, explosion, lack of emergency exits.</td>
<td>1</td>
<td>6%</td>
</tr>
</tbody>
</table>

Figure 5. Occupational risks of nursing professionals in work environments.

Occupational risks identified in scientific productions, was featured in the following order: biological risks (66%), chemicals (61%), ergonomic risks and psychological (33%), physical risks (22%) and other risks (6%). The majority of the productions identified more of a risk. According to some authors7,8-11, biohazards are usually influenced by the structure of the environment, type of patient (child), inattention, careless and use of Personal Protective Equipment (PPE) and to avoid them nursing professionals should exercise caution in the development of work activities.

Already chemical risks are related to the preparation, administration and disposal of materials without PPE or inappropriate use, and in many cases as antineoplastic agents for not following the norms prescribed by the Ministry of Health (MOH).12-4

Ergonomic risks and distress were associated with inappropriate rooms for tests, insufficient number of professionals, and lack of materials, work overload, poor professional development, and lack of leisure time, low wages and work pace.15-7

Physical risks are associated with the lack of public policies to establish appropriate working conditions, physical structure, job
security and the use of EPI. The use of PPE are not related to most accidents, because the PPE is protective barrier for the worker therefore effectively reduces the risk of exposure, however, does not eliminate the risk.

The occupational risk can is hidden by ignorance, lack of knowledge or information, which means that workers do not suspect the risk, which can be detrimental to your health. The safety of workers depends on each subject to recognize the hazards present in work environments.

It is of great importance to develop an organizational system, and supervision aimed at ensuring the teaching of precautions to professionals as well as the commitment of adherence to use of precautions. Moreover, to promote health education as a protective measure and individual and collective security and the administration and human resources.

- Cancer and its relation to occupational risks among nursing staff

The occupational cancer is considered a form of delayed toxicity in clinical course and its outcome, due to exposure to chemical, physical or biological agents classified as carcinogenic and present in the workplace. The International Agency for Research on Cancer (IARC) classifies exposures to substances based on the strength of scientific evidence. There are four groups: group 1 - sufficient evidence for carcinogenicity, group 2-A likely carcinogen, Group 2B - possibly carcinogenic; Group 3 - not classifiable and group 4 - not cancerous.

Scientific productions surveyed 18 (100%), only 28% of the occupational risks associated to cancer, in particular chemical risks, and of these 22% related to antineoplastic and 6% relate to ethylene oxide. The majority of productions identify what the risks are, but do associations with cancer. This association is necessary for cancer is a disease that causes serious damage to health or even death of the professionals.

The cytotoxic chemotherapeutic drugs are responsible for effects such as carcinogenicity, mutagenicity, infertility, teratogenicity workers who manipulate. The risks are related to the preparation, administration and disposal of materials associated with the inappropriate use or non-use of PPE and for not following the standards advocated by MS.

For professional smokers this association with antineoplastic agents increases the risk of developing lung cancer. In a study of 430 the use of PPE is protective barrier for the worker therefore effectively reduces the risk of exposure, however, does not eliminate the risk.

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CONCLUSION

Given the results, it requires greater investment in research on the association between occupational hazards and cancer nurses. The North, Midwest and South, and the Journals and Public Health Collective were the worst in terms of publications on this subject in the study.

The scientific production indicates that nurses are exposed in the workplace to biological, chemical, ergonomic, psychological and physical, in that order. The association between occupational hazards and cancer has been rarely reported and only joined chemical hazards in the specific antineoplastic and ethylene oxide. Since other scientific evidence establishing this association, in addition to chemical hazards, biological hazards, physical and ergonomic to cancer.

The most common cancers that affect nurses are: breast cancer, skin, liver, lung, leukemia, among others. This association interferes in the lives of nursing professionals compromising the quality of life and consequently the assistance.

For protection of nursing professionals in working environments, it is necessary to take precautionary measures, as well as continuing education and continuing for these workers meet occupational risks, consequences and impacts on quality of life. And also develop public policies that working conditions that are imposed on these professionals and support workers’ health in the workplace itself.

It is hoped that this study will stimulate further research on this topic very relevant scientific, academic and professional, and the Occupational Health constitute a public health problem throughout the country.

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