

# Occupational accidents among nursing professionals working in critical units of an emergency service

*Acidente ocupacional entre profissionais de enfermagem atuantes em setores críticos de um pronto-socorro*

*Accidentes del trabajo de los profesionales de enfermería activos en sectores críticos de una emergencia*

Pollyanna Salles Rodrigues<sup>1</sup>  
 Alvaro Francisco Lopes de Sousa<sup>2</sup>  
 Marcia Cristina da Silva Magro<sup>1</sup>  
 Denise de Andrade<sup>2</sup>  
 Paula Regina de Souza Hermann<sup>1</sup>

1. Universidade de Brasília, Faculdade de Ceilândia. Brasília, DF, Brazil.

2. Universidade de São Paulo, Escola de Enfermagem. Ribeirão Preto, SP, Brazil.

## ABSTRACT

**Objective:** Identify the prevalence of occupational accidents among nursing professionals working in critical units of an emergency service and understand the professional experience among the injured professionals. **Methods:** A descriptive cross-sectional study was conducted with 75 professionals, in two consecutive stages. A quantitative analysis was performed by descriptive statistics, and the participants' statements were processed in the IRaMuTeQ software, and analyzed according to the hierarchical descending classification. The findings were based on the collective subject discourse method. **Results:** The overall prevalence of accidents was 26.7%. Of these, 72.2% involved sharp materials and blood was the main biological agent involved in 84.2% of the accidents. Three classes were defined: "Experiencing an occupational accident"; "Post-exposure conduct" and "Occupational accident prevention". **Conclusion:** A high rate of injured professionals was observed, with a higher prevalence among those at a technical level. The experience of suffering an accident seems to be closely related to moments (before, after and during), causes, consequences and feelings.

**Keywords:** Occupational risks; Occupational health; Accident prevention; Nursing.

## RESUMO

**Objetivo:** Identificar a prevalência de acidentes ocupacionais entre profissionais de enfermagem atuantes em setores críticos de um pronto-socorro e apreender a vivência profissional dentre os acidentados. **Métodos:** Pesquisa descritiva, transversal, realizada em duas etapas consecutivas, com 75 profissionais. A análise quantitativa foi realizada por estatística descritiva, enquanto os depoimentos foram processados no *software* IRaMuTeQ, analisados de acordo com a Classificação Hierárquica Descendente. Os achados foram fundamentados no método do Discurso do Sujeito Coletivo. **Resultados:** A prevalência geral de acidentes foi de 26,7%. Destes, 72,2% envolviam material perfurocortante e, em 84,2% deles, o sangue foi o principal agente biológico envolvido. Registraram-se três classes: "Vivenciando o Acidente Ocupacional"; "Condutas Pós-Exposição" e "Prevenção do Acidente Ocupacional". **Conclusão:** Registrou-se alta taxa de profissionais acidentados, com maior prevalência entre aqueles de nível técnico. A vivência do acidente parece encontrar-se imagetivamente ligada a momentos (antes, após e durante), causas, consequências e sentimentos.

**Palavras-chave:** Riscos Ocupacionais; Saúde ocupacional; Prevenção de acidentes; Enfermagem.

## RESUMEN

**Objetivo:** Identificar la prevalencia de accidentes de trabajo entre los profesionales de enfermería activos en sectores críticos de una emergencia y comprender la experiencia profesional entre los heridos. **Métodos:** Estudio descriptivo transversal, realizado en dos etapas consecutivas, con 75 profesionales. El análisis cuantitativo se realizó mediante estadística descriptiva, mientras que los informes fueron procesados en el *software* IRaMuTeQ, analizados de acuerdo a la Clasificación Jerárquica Descendente. Los hallazgos se basan en el método del Discurso del Sujeto Colectivo. **Resultados:** La prevalencia global de accidentes fue de 26,7%. De estos 72,2% fueron causados por objetos punzantes y en 84,2% la sangre era el principal agente biológica implicado. Tres clases fueron encontradas: "Experimentar Accidente de Trabajo"; "Post-Exposición Tuberías" y "Prevención de Accidentes de Trabajo". **Conclusión:** Se grabó alta tasa de accidentes que se encuentran con mayor prevalencia entre las personas de nivel técnico. La experiencia del accidente parece estar vinculada a momentos (antes, durante y después) por imagen, las causas, las consecuencias y los sentimientos.

**Palabras clave:** Riesgos Laborales; Salud Laboral; Prevención de accidentes; Enfermería.

### Corresponding author:

Paula Regina de Souza Hermann.  
 E-mail: paularegina@unb.br

Submitted on 01/13/2017.

Accepted on 02/23/2017.

DOI: 10.5935/1414-8145.20170040

## INTRODUCTION

Nursing professionals present a higher risk of being involved in occupational accidents. In addition to being the largest group of health professionals involved directly and continuously with patient care, they make physical efforts on a daily basis, have longer working hours, operate difficult-to-handle equipment, biological materials, among others. In critical units of a hospital, this risk increases due to the use of new and heavy machines without proper training to operate such devices.<sup>1,2</sup>

Critical areas present a higher risk of infections, as they provide care to patients in more serious conditions. In these areas, invasive procedures are performed, with frequent handling of contaminated items. In particular, emergency services receive different emergency and urgent cases and, in their routine, find favorable conditions for exposure to biological materials, due to their dynamics, diversification and amount of care provided.<sup>2,3</sup>

In Brazil, Regulatory Standard 32 establishes the use of personal protective equipment (PPE), professional training, vaccination, among other provisions, to avoid or minimize errors. However, it has been ineffective, due to low adherence rates and difficult inspection.<sup>2,4</sup>

In this sense, knowing the health professionals' perception of accidents enhances the understanding of their routine and the collective subjectivity linked to this phenomenon. From this understanding, it is possible to propose coping strategies and prevention, control and chemoprophylaxis measures.

Given the considerations above, this study aimed to identify the prevalence of occupational accidents among nursing professionals working in critical units of an emergency service and understand the professional experience among the injured professionals.

## METHODS

This descriptive cross-sectional study was conducted in two consecutive stages. The first stage aimed to identify the prevalence of occupational accidents among nursing professionals, and in the second stage, the researchers interviewed the injured professionals, seeking to collect their perspectives of the accident.

The study was conducted in the emergency service of the Regional Hospital of Ceilândia, a large city of the Federal District. The hospital, associated with the emergency service, serves an estimated population of 500,000 inhabitants, which accounts for around 25% of the total population of the Federal District. The sample consisted of 75 professionals: 14 nurses and 61 nursing technicians, selected by simple random sampling from a universe of 35 nurses and 79 nursing technicians.

The inclusion criteria were: the professionals had to be part of the permanent care staff and members of the team for at least one year. Professionals away from work, on vacation and/or on a work leave were excluded, as well as those from other units working overtime in the emergency service and those who were absent during the data collection period.

The prevalence of occupational accidents was calculated from the records of the Work Accident Report (*Comunicação de Acidente de Trabalho*, CAT). Then, the injured professionals were interviewed. The purpose of this study was explained to them; and they were requested to answer a semi-structured questionnaire with theme-related questions.

The interviews were conducted in a reserved room of the institution, recorded in mp4 file format. They lasted, on average, 35 to 40 minutes each one, and were later transcribed. At the end of each interview, the participants were asked if they would like to quit or change their answer, but there were no withdrawals or changes in the reports.

A quantitative data analysis was performed through descriptive statistics using measures of central tendency (frequency, mean and standard deviation), processed by the Statistical Package for the Social Sciences (SPSS), version 20.0.

The statements were grouped, creating a corpus, which had a statistical treatment in IRaMuTeQ<sup>5</sup> (*Interface de R pour les Analyses Multidimensionnelles de Textes et de Questionnaires*), and were later analyzed through the descending hierarchical classification (DHC).<sup>6</sup> The use of software helped understand the study theme using a qualitative approach, particularly IRaMuTeQ.<sup>2,7-9</sup> Then, the data produced by the software generated segments of classes, which were called "pre-classes". They included text segments with similar vocabulary, but different from the text segments of other classes.

Then, key expressions were identified from the interviewees' speeches, which complemented the findings from the DHC and allowed speech categorization into "definitive classes." Analyses were based on the method of collective subject discourse.<sup>10</sup>

The study was approved by a research ethics committee (Nr. 460.052). To preserve the identity of the participants, an alphanumeric system and Arabic numerals were used (e.g. NUR01 and TEC01).

## RESULTS

The study analyzed 75 nursing professionals, who were predominantly nursing technicians (81.4%) and female (62.6%). Among the nursing technicians, 18 had an occupational accident, a number that is much higher than that of nurses (2) (Table 1).

The prevalence of accidents with sharp items was 72.2%, with blood being the main biological agent involved (84.2%). Lumen needles were the instrument involved in most percutaneous exposure cases (50%).

The 20 professionals who had accidents (18 technicians and two nurses) were interviewed, and their speeches were recorded for analysis. Starting from 20 initial context units (ICUs), 573 elementary context units (ECUs) and 22,156 occurrences were recorded, and 78.3% of the total corpus was used. The most relevant words highlighted and their relation with the speeches were analyzed for the creation of "pre-classes".

Based on the collective subject discourse method to detail the experiences and perceptions of these professionals about

**Table 1.** Characteristics of health professionals

Professional category	Nurse		Nursing technician		
	Had an accident?	No	Yes	No	Yes
		12 (85.7%)	2 (14.3%)	43 (70.5%)	18 (29.5%)
Sex					
Female		4 (33.3%)	1 (50%)	29 (67.4%)	13 (72.2%)
Male		8 (66.7%)	1 (50%)	14 (32.6%)	5 (27.8%)
Age (years)		40.4 ± 12.8	45.5 ± 13.4	42.7 ± 7.4	39.8 ± 9.1
Length of time in the job (months)		114.8	84	114	114
Area of work in the emergency service					
Medical-surgical unit		2 (16.6%)	-	23 (53.9%)	1 (5.5%)
Orthopedics		-	-	3 (6.9%)	-
Stabilization		3 (25.0%)	-	11 (25.6%)	6 (33.3%)
More than one unit		5 (41.6%)	2 (100%)	5 (11.7%)	11 (61.2%)

the accident with sharp items, "key expressions" were identified and quantified, allowing the creation of the definitive classes, respecting the trends indicated by the software (Figure 1).

### Class 1: Experiencing an occupational accident

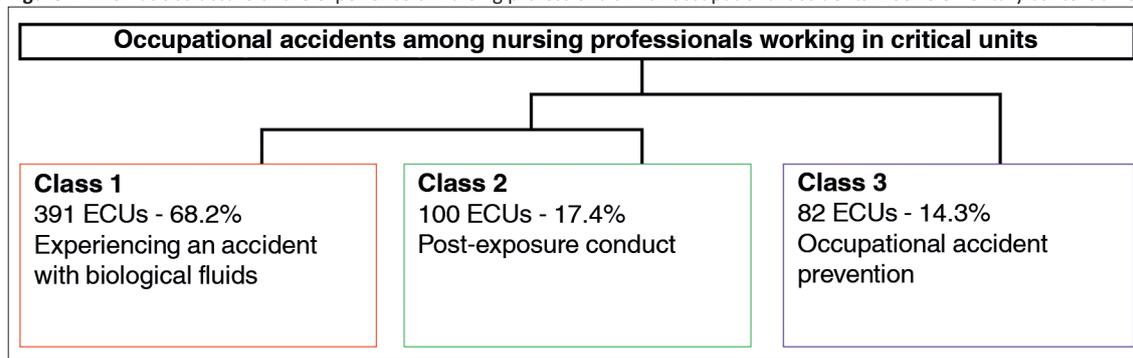
The content presented in this class addressed aspects related to the professional experience regarding occupational accidents. The participants, through their personal experience, attempted to build representations of this phenomenon: being a nurse vulnerable to occupational accidents. In their reports, they mentioned aspects related to prior conditions, causes, feelings experienced, consequences, and importance of updated knowledge.

Experiencing an occupational accident seemed to be imaginatively classified by professionals into periods, to which they attribute "the most dramatic" characteristics. The first period, didactically called "before the accident" was characterized by their poor knowledge on risk management measures, closely related to a higher or lower risk of accident.

*It's like a gun in a policeman's hand, the more he knows about the gun, the more dangerous it gets. For us, who work with health, it is the same, the more we have worked with that, the more relaxed we get, and that's a risk. (TEC14)*

*We are always busy, the team in general is not aware of the risks, and when something happens, they don't know what to do. (TEC02)*

At this moment, the participants used the word "cause" very often, as they tried to justify the occurrence of an accident. The most frequent causes of accidents were: carelessness, lack of preparation or technical failure by the professional, and improper disposal of sharp items, which were linked to work overload, patient conditions, and inadequacy of materials, equipment and structure. The professionals associated the accident with personal and professional factors, strongly influenced by organizational issues.

**Figure 1.** Thematic structure of the experience of nursing professionals with occupational accidents. ECU: elementary context units.

*The most frequent cause is professional carelessness!  
(NUR01)*

*I've done that for many years, this time I was careless...  
(NUR29)*

*It wasn't due to inability, imprudence, but work overload.  
The work here is practically inhuman. (TEC07)*

The second moment defined as "during the accident" was one of the most critical for the professionals, who considered the maintenance of the technique as the main method to prevent the occupational accident. The correct utilization of the technique during the procedures was again crucial and seemed to provide a feeling of security that justified also the negligence when using standard precautionary measures, thus increasing the risk of accident.

*Both times I was in a hurry to perform the task... because, when you're in a hurry, you forget how to perform the technique or do it incorrectly. Sometimes, the unusual practice of the technique, or lack of time, leads to an accident. (TEC06)*

*Lack of attention and, in the case of the scalpel, it was due to lack of technique. (TEC03)*

*I've always done that, the glove disturbs, it reduces the sensitivity, that's why I don't wear gloves. (TEC09)*

When the accident occurred, the professionals presented a flood of feelings. The subjectivity and the associated impact were neutralized by their professional experience, taking into account their concepts, principles, knowledge of the subject, experiences, among other subjective factors.

The different feelings the professionals presented included: fear, concern, emotional shock, anguish, anxiety, anger, guilt, annoyance, religious attachment, stress, doubt, and tranquility.

*Yes, I got hurt... I wonder if the patient has, or doesn't have... and now? What can I do? What is... what can I do now? (NUR02)*

*At first, I was in revolt, how could I make that mistake?  
(TEC12)*

The third moment referred to the "post-accident" period, strongly linked to the word "consequence", represented as the personal and professional impact caused by the accident. Depending on the type of exposure, the biological agent involved and the post-exposure conduct, such impact can involve permanent physiological and psychosocial consequences. However, some injured professionals reported positive consequences, such as the fact that they have learned from experience.

*My, did I get anything from this patient? He hasn't been diagnosed yet, how can I treat something I don't know?  
(TEC05)*

*I was petrified! I was down, in revolt and everything, because I always do things right, then someone comes and leaves the needle there. (TEC01)*

## **Class 2: Post-exposure conduct**

The importance given to the contents grouped in this class was closely associated with Class 1: Experiencing an occupational accident. The way the accident happened and the "professional behavior" in prior moments neutralized the impact and contributed to the decisions regarding their post-exposure behavior. In addition, their mobilized knowledge, beliefs, support, values and emotions also influence the "post-accident situation," and this is why they were grouped separately in this new class.

*At the moment of the accident, I stopped everything I was doing and sought medical care. (TEC02)*

*I did everything right, I went there, I filled out the form, I took the medication that has to be administered up to 2 hours after the accident, because I had colleagues who were infected and they said: "Ah, nobody did anything. They didn't tell me what to do." (TEC17)*

It was clear that most interviewed professionals did not know how to proceed after the exposure, regardless of their professional category (nurse or technician). They reported that they acted inadequately because of fear, possibility of reprehension or shame. They also reported a greater fear of HIV infection during exposure to biological fluids. Another finding related to this virus was that the side effects caused by prophylactic medication could be noticed by their peers, causing changes in their body and aspect.

*The patient had an HIV diagnosis and suspected hepatitis C. I was shaken, thinking that I'd have to take the two medications, and that it would harm my body. (TEC18)*

## **Class 3: Occupational accident prevention**

In this class, the professionals recognized their situation of vulnerability to several occupational risks while providing patient care. They emphasized the biological risk due to the frequency and potential damage.

Professional protective equipment was identified by the professionals as the most important measure of occupational accident prevention. However, recognizing the importance of PPE did not seem to directly influence its use, since only 16.6% of the injured professionals used at least one PPE item. Of these, 33.3% were wearing gloves only and 22.2% were wearing the white coat only at the moment of the accident.

*In the first accident, I was not wearing it. In those days, there were no safety glasses available... (TEC16)*

*The glove. But the glove is... as I show you here, look... very thin, very thin. Any needle will puncture it. (TEC13)*

*Safety glasses, no... no safety glasses are available here in the emergency service. (NUR01)*

*In the first accident, I was not wearing it, the only thing I was wearing was the white coat, not even gloves I was wearing. (TEC11)*

## DISCUSSION

Occupational accidents are present in the daily routine of nursing professionals working in critical sectors of emergency services. In this environment, the experience of having an accident is imaginatively linked to moments (before, after and during), causes, consequences and feelings. Participating in the study meant for the professionals recalling these moments and exposing the anguish, uncertainties and fears of the diagnosis, and their nonacceptance of the mistake, which could lead to an untreated condition and exposure to heavy medication, such as antiretroviral drugs.

Understanding the experience of the occupational accident revealed the meaning attributed to the phenomenon, in a subjective and intimate perspective of the professional. Nursing professionals, because of the activities they perform, are more closely related to their patients, which exposes them to greater chemical, physical, biological, and psychological loads that are aggravated by their low wages, long working hours, insufficient training, occupational stress, among other negative factors. These aspects generate stressing processes that contribute to reduced labor ability, more exposure and, consequently, mistakes.<sup>11,12</sup>

The nursing practice, as it involves the handling and manipulation of sharp items, blades, catheters and other products that may puncture the skin, makes these professionals more susceptible to accidents and exposes them to biological agents with apathogenic potential. In the nursing team, the highest exposure is of professionals with technical training (high school), such as aides and technicians, due to their load of activities with patients, little interest in training and professional update, and low adherence to standard precautions.<sup>13</sup>

Moreover, a high frequency of accidents is observed in professionals over 40 years of age, who use their experience, skills, and length of time working for the institution as justifications to neglect the use of preventive measures when performing procedures and providing patient care.<sup>13,14</sup> However, the accidents are not only related to the level of education and age, but also to skills, proper training, provision of materials and the development of an organizational culture in the workplace.<sup>15</sup>

The accident and, consequently, the exposure cause insecurity and fragility in the professionals, who rethink their personal life and, particularly, their professional life. The type of exposure,

the diagnosis (or not) of the patient and the probability of virus infection (HIV, hepatitis C or B) also make them think about the risk of death. When they consider a probable occupational infection, the fear of the side effects caused by the medication seems to be equivalent to that of contracting a disease.

Carelessness seems to be one the main causes of accidents. In the interviews, they also mentioned workload, the patient's conditions, and the inadequacy of materials, equipment and infrastructure as causes of accident. Most percutaneous accidents occur when specific care is forgotten, such as not using the finger to support the needle, not re-capping the needle, twisting or removing used needles with the hands, and not disposing all sharp items in an appropriate container.<sup>16</sup>

All professionals interviewed reported that they were aware of the risks and consequences of accidents with biological material, but that most of them did not know how to proceed. The challenges faced by the professionals after the accident reflect inauthentic care or careless actions after the occupational exposure.<sup>17</sup> Fear is the first feeling experienced after having an accident with biological material, and it is enhanced by the possibility of judgment and reprehension by their peers and managers.<sup>18</sup>

When compared to the conducts recommended by the Brazilian management bodies, such as the Ministry of Health and the National Health Surveillance Agency,<sup>15</sup> in case of an accident with biological material, the actions performed by the victims were often inadequate. Proper care includes local care in the affected region, reporting and follow-up.

However, some professionals were resilient in relation to the accident, stating that the experience with the accident contributed to professional learning in terms of acquiring experience, tightening vigilance when performing the procedures, taking extra care when handling sharp items, and giving more importance to the use of PPE.

Investments in education and continuous training of the nursing team are required, so that the nursing professionals adopt prevention and protection measures while performing their activities. It should be noted that institutional inspections are not sufficient, everyone should be committed to observing standard precautions and the use of PPE. The organizational system should have a structure for injured professionals and clarify the behaviors, thus promoting an environment of protection to the nursing staff.<sup>19,20</sup>

This study had limitations, mainly caused by its design (cross-sectional study) that does not involve the follow-up of participants, which would allow the authors to identify the incidence and risk and/or protection factors.

## CONCLUSION

This study observed a high rate of professionals who have had occupational accidents, with a higher prevalence among technical professionals. They emphasized carelessness as

the most frequent cause of accidents, followed by inadequate disposal of sharp items. Occupational accidents are present in the daily routine of nursing professionals and cause a number of personal and professional consequences. The experience with the accident seems to be imaginatively related to moments (before, after and during), causes, consequences and feelings.

## REFERENCES

- Simonelli AP, Jackson Filho JM, Vilela RAG, Almeida IM. Influence of behavioral safety practices and models of prevention of occupational accidents: a systematic review of the literature. *Saude soc.* [Internet]. 2016 June [cited 2016 Nov 14]; 25(2): 463-478. Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0104-12902016000200463&lng=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0104-12902016000200463&lng=en). DOI: 10.1590/S0104-12902016147495.
- Sousa AFL, Queiroz AAFLN, Oliveira LB, Moura MEB, Batista OMA, Andrade D. Social representations of biosecurity in nursing: occupational health and preventive care. *Rev Bras Enferm.* [Internet]. 2016 Oct [cited 2016 Nov 14]; 69(5): 864-71. Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0034-71672016000500864&lng=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672016000500864&lng=en). DOI: 10.1590/0034-7167-2015-0114.
- Georgino MM, Kress T, Alexander S, Beach M. Emergency Preparedness Education for Nurses: Core Competency Familiarity Measured Utilizing an Adapted Emergency Preparedness Information Questionnaire. *J Trauma Nurs* [Internet]. 2015 June [cited 2016 Nov 14]; 22(5):240-8; quiz E1-2. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/26352654>. DOI: 10.1097/JTN.000000000000148.
- Ministério do Trabalho e Emprego (BR). Portaria nº 485, de 11 de novembro de 2005. Aprova a norma regulamentadora nº 32 (Segurança e saúde no trabalho em estabelecimentos de saúde). *Diário Oficial da República Federativa do Brasil, Brasília (DF)*; 2005 Nov 11. Available from: [http://www.mte.gov.br/legislacao/normas\\_regulamentadoras/nr\\_32.pdf](http://www.mte.gov.br/legislacao/normas_regulamentadoras/nr_32.pdf)
- Ratinaud P, Marchand P. Application of the ALCESTE method to the large corpus and stabilised lexical worlds or 'cablegate', using IRAMUTEQ. *Actes des 11eme JADT* [Internet]. 2012[cited 2016 Nov 14]:835-44. Available from: <http://lexicometrica.univ-paris3.fr/jadt/jadt2012/Communications/Ratinaud,%20Pierre%20et%20al.%20-%20Application%20de%20la%20methode%20Alceste.pdf>
- Reinert M. Une methode de classification descendante hierarchique: application a l'analyse lexicale par contexte. *Les Cahiers de l'Analyse des Donnees.* 1983; 8(2):187-98. Available from: <https://eudml.org/doc/88079>
- Sousa AFL, Queiroz AAFLN, Oliveira LB, Valle ARMC, Moura MEB. Social representations of community-acquired infection by primary care professionals. *Acta paul. enferm.* [Internet]. 2015 Aug [cited 2016 Nov 14]; 28(5):454-9. Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S0103-21002015000500454&lng=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-21002015000500454&lng=en). DOI: 10.1590/1982-0194201500076.
- Kami MTM, Larocca LM, Chaves MMN, Lowen IMV, Souza Viviam MP, Goto DYN. Working in the street clinic: use of IRAMUTEQ software on the support of qualitative research. *Esc. Anna Nery* [Internet]. 2016 [cited 2016 Nov 14]; 20(3): e20160069. Available from: [http://www.scielo.br/scielo.php?script=sci\\_arttext&pid=S1414-81452016000300213&lng=en](http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1414-81452016000300213&lng=en). DOI: 10.5935/1414-8145.20160069.
- Moura LKB, Marcaccini AM, Matos FTC, Sousa AFL, Nascimento GC, Moura MEB. Integrative review on oral cancer. *Rev Pesq Cuidad Fund* [Internet]. 2015; 6(5):164-75. Available from: <http://www.seer.unirio.br/index.php/cuidadofundamental/article/view/4516>. DOI: 10.9789/2175-5361.2014.v6i5.164-175
- Lefèvre F, Lefèvre AMC, Teixeira JJV. O discurso do sujeito coletivo: uma nova abordagem metodológica em pesquisa qualitativa. *Educs.* 2000.
- Phillips JA, Miltner R. Work hazards for an aging nursing workforce. *J Nurs Manag.* [Internet]. 2015 Aug [cited 2016 Nov 14]; 23(6):803-12. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/jonm.12217/epdf>. DOI: 10.1111/jonm.12217.
- Harling M, Schablon A, Peters C, Nienhaus A. Predictive values and other quality criteria of the German version of the Nurse Work Instability Scale (Nurse WIS) follow up survey findings of a prospective study of a cohort of geriatric care workers. *J Occup Med Toxicol.* [Internet]. 2014 Aug [cited 2016 Nov 14]; 9:30. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC25516765/>. DOI: 10.1186/s12995-014-0030-9.
- Batista OMA, Moura MEB, Sousa AFL, Andrade D. Occupational risk between critical sectors nursing professionals and adherence to standard precaution. *Rev Cub Enferm.* 2016; 32(4). In Press
- Jones MK, Latreille PL, Sloane PJ, Staneva AV. Work related health risks in Europe: are older workers more vulnerable? *Soc Sci Med.* [Internet]. 2013 Aug [cited 2016 Nov 14]; 88:18-29. Available from: <http://www.sciencedirect.com/science/article/pii/S0277953613001962>. DOI: 10.1016/j.socscimed.2013.03.027.
- Salgado TA, Ream PS, Teles SA, Lima LK, Rezende FR, Cardoso NQ, Tipple AF. Accidents with biologic material in health services among persons with no presumed risk. *Am J Infect Control.* [Internet]. 2016[cited 2016 Nov 14]. pii: S0196-6553(16)30578-8. Available from: <http://www.sciencedirect.com/science/article/pii/S0196655316305788>. DOI: 10.1016/j.ajic.2016.06.011
- Samur M, Intepeler SS. Factors influencing nurses' perceptions of occupational safety. *Arch Environ Occup Health.* [Internet]. 2016 [cited 2016 Nov 14]; 19:1-8. Available from: <http://www.tandfonline.com/doi/full/10.1080/19338244.2016.1156045>. DOI: 10.1080/19338244.2016.1156045
- Bernardes CL, Baptista PCP. Exposições ocupacionais aos fluidos biológicos, repensando estratégias de intervenção: estudo qualitativo. *OBJN.* [Internet]. 2015[cited 2016 Nov 14]; 14(3):321-31. Available from: [http://www.objnursing.uff.br/index.php/nursing/rt/printerFriendly/5150/html\\_878](http://www.objnursing.uff.br/index.php/nursing/rt/printerFriendly/5150/html_878)
- Petitta L, Probst TM, Barbaranelli CJ. Safety Culture, Moral Disengagement, and Accident Underreporting. *Bus Ethics* [Internet]. 2015[cited 2016 Nov 14]; 15:1-16. Available from: <http://link.springer.com/article/10.1007/s10551-015-2694-1>. DOI: 10.1007/s10551-015-2694-1.
- Hessels AJ, Larson EL. Relationship between patient safety climate and standard precaution adherence: a systematic review of the literature. *J Hosp Infect.* [Internet]. 2016 [cited 2016 Nov 14]; 92(4):349-62. Available from: <http://www.sciencedirect.com/science/article/pii/S0195670115003485>. DOI: 10.1016/j.jhin.2015.08.023.
- Rozenbojm MD, Nichol K, Spielmann S, Holness DL. Hospital unit safety climate: relationship with nurses' adherence to recommended use of facial protective equipment. *Am J Infect Control.* [Internet]. 2015 [cited 2016 Nov 14]; 43(2):115-20. Available from: [http://www.ajicjournal.org/article/S0196-6553\(14\)01296-6/pdf](http://www.ajicjournal.org/article/S0196-6553(14)01296-6/pdf). DOI: 10.1016/j.ajic.2014.10.027