

**Occupational risk factors reported by a nursing team in an outpatient care unit
in a university hospital****Fatores de risco referidos pela equipe de enfermagem em ambulatório de
especialidades**

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ABSTRACT

Objective: To investigate occupational risk factors reported by a nursing team in an outpatient care unit in a University Hospital. Method: Cross-sectional descriptive study conducted with nurses. Results: The study included 76 nurses, aged 25 to 65 years. Incidents involving biological and psychosocial risk factors had the greatest impact (133 times each), followed by ergonomic (93), physical (32) and chemical (19). Among the 39 professionals who have suffered occupational accidents, 31 reported needlestick injuries. Approximately 90% reported using some type of personal protective equipment. Conclusion: Biological and psychosocial risk factors had the most impact, followed by ergonomic, physical and chemical. Investment in preventive measures is essential to prevent these issues.

Keywords: Occupational Health, Nursing, Nursing Team, Outpatient Care Facilities.

RESUMO

Objetivo: Investigar os fatores de risco ocupacional relatados por uma equipe de enfermagem de um ambulatório de um hospital universitário. Método: Estudo descritivo transversal, realizado com enfermeiros. Resultados: O estudo incluiu 76 enfermeiros, com idades entre 25 e 65 anos. Incidentes envolvendo fatores de risco biológicos e psicossociais tiveram o maior impacto (133 vezes cada), seguidos de ergonômico (93), físico (32) e químico (19). Entre os 39 profissionais que sofreram acidentes de trabalho, 31 relataram lesões por picada de agulha. Aproximadamente 90% relataram usar algum tipo de equipamento de proteção individual. Conclusão: Os fatores de risco biológicos e psicossociais tiveram maior impacto, seguidos pelos de ergonomia, físico e químico. O investimento em medidas preventivas é essencial para evitar esses problemas.

Palavras-chave: Saúde do Trabalhador, Enfermagem, Equipe de Enfermagem, Ambulatório.

1 INTRODUCTION

Nursing plays a critical role in health services, and the development of teamwork creates a shared benefit to users, to help meet their needs in the treatment process. The day-to-day work of healthcare professionals, as well as close interactions between professionals and users are essential, but expose the professionals to occupational hazards. Nursing work is physically exhausting when it comes to patient management,[1] and the situation in an outpatient hospital is no different. Occupational risk is born from inherently unhealthy and dangerous work activities that can cause adverse health effects to the worker, especially if the rules are never enforced. [2, 3] Nurses represent approximately 60% of the workforce in hospitals,[4] spending the most time providing patient care with exposure to the most risks. The type of work done by these professionals can increase physical and psychosocial burdens, promoting illness,[5] and has been the subject of study and intervention by the Ministry of Health in Brazil, by way of proposals that involve greater vigilance. Occupational hazards are classified into physical, chemical, biological, ergonomic and psychosocial, mechanical, and accidents.[4, 6] Physical hazards increase as a result of exposure to various forms of energy, such as noise, vibration, abnormal atmospheric pressure, extreme temperatures, ionizing and nonionizing radiation, ultrasound and infrasound.[4, 7, 8] Chemical hazards are the result of exposure to substances, compounds or materials in liquid, gas, vegetable mineral particulate, dust, fumes, gases or vapors that may come into contact with the body through the respiratory system or absorbed by the body through the skin, or ingestion.[4, 7] The characteristics of hazardous chemicals handled by nurses relate directly to waste, which when managed improperly, can increase its potential flammability, corrosivity, reactivity and toxicity to humans and the environment.[9]

Biohazards are the risk factor that are involved in the most incidents among health professionals and come from exposure to genetically modified micro-organisms, viruses, bacteria, cell cultures, parasites, toxins and prions that can cause harm.[4, 7, 10, 11] Elevated expectations of healthcare professionals is a contributing factor to psychosocial risks, which contrasts with any lack

of time, skills, and social support; facing suffering, treatment of dying patients, emergencies, exposure to traumatic events, complaints, and disputes.[12] Ergonomic risks come from exposure to conditions that may affect psychophysiological characteristics of the body (use of equipment, machinery and inadequate furniture, demanding postures and incorrect positions, places with poor lighting and ventilation) and can negatively impact productivity and worker safety.[4, 13] Mechanical hazards and accidents are linked to machinery, physical arrangement of space, order and cleanliness of the work, signage, labeling, and other products that can lead to work-related injuries.[4, 7] Concern over the use of personal protective equipment (PPE) to minimize exposure to occupational risks was intensified after the emergence of infectious diseases such as AIDS, Hepatitis B and C, and other bloodborne pathogens. PPE is effective for the prevention of accidents and should be made available by the service provider. However, compliance with use policies, cooperation, and the adoption of measures to make the work environment safer need to come from the workers themselves.[14] In hospitals, performance of professional nursing takes place in various environments, such as inpatient units and surgical clinic, maternity, the operating theatre, intensive care unit, emergency department, and outpatient clinics. Even in outpatient situations where there is no hospital stay, there are unhealthy activities such as handling chemicals, physical exertion, procedures with low and medium complexity, among others. Thus, outpatient procedures expose nursing professionals to risks similar to those working in any other hospital department.[5, 10] This study aimed to investigate the occupational risks among members of the nursing staff who work in outpatient care in a university hospital.

2 METHODS AND MATERIALS

Descriptive study, cross-sectional, prospective, performed in the outpatient care unit of a teaching hospital in Central Brazil, in the period May to December 2012. The department serves a variety of medical specialties where approximately 8,776 procedures per month are performed, including immunizations, minor surgery, examinations, and outpatient procedures of low and medium complexity. The study population consisted of 147 members of the nursing staff who work 30 hours per week and are rotated among care units. Professionals working in services were excluded where, although they are considered outpatient units, procedures of high complexity are performed, or functions are specific and unique to the industry and deserve specific studies, such as endoscopy (15), chemotherapy (05), dialysis and hemodialysis (39). This study identified 88 nursing professionals as eligible to participate. Of these, 12 refused to participate, leaving a sample of 76 participants. To collect data, a questionnaire containing questions relating to socio-demographics (gender, age, professional category, institutional affiliation, time on the job and in

outpatient care), double employment (employed in more than one service or having more than one job), occupational hazards to which professionals thought themselves to be exposed, occurrence of occupational accidents and the use of PPE. The data collection instrument was developed considering the classification of occupational hazards by the Ministry of Health / Pan American Health Organization;[4] and Brazilian regulations NR-7, NR-9, and NR-32, dealing with the medical management of occupational health, environmental risk prevention, and worker safety and health in health services, respectively;[7] and studies that address mental health care at work.[15] Mechanical hazards were not included in the instrument as they relate to machines that do not exist in the outpatient environment, as well as the order and cleanliness of the work environment, not performed by this team. The data collected were organized and analyzed using the Statistical Package for Social Science version 18.0, descriptive analysis was performed to present the results in frequencies, means, and medians.

3 RESULTS

The study included 76 professionals, mostly female, mostly nursing technicians, in the Brazilian National Health Service, as well as people with different employment contracts, assigned to outpatient activities (table 1).

Table 1 Socio-demographic characteristics of nursing team members in outpatient care (N=76)

Characteristics	N	%
Gender		
Female	70	92.1
Male	06	7.9
Nursing Team		
Nurse	17	22.4
Nursing Technician	48	63.1
Nursing Auxiliary	11	14.5
Employer		
National Health Service	66	86.8
City Health Department	07	9.3
State Health Department	03	3.9
Double Employment		
Yes	34	44.7
No	42	55.3

The age ranged 25-65 years, mean 49.80 ± 8.0 years; the mean time in hospital service was 16.8 ± 8.2 years and the median time working at the clinic was 9 years. Approximately half of the professionals worked in more than one health unit, both units classified as outpatient hospitalization.

Study participants reported exposure to 410 risk factors. The instrument for data collection allowed for more than one response for each item (table 2).

Table 2 Occupational risk factors according to members of the nursing team in an outpatient service (N=76)

Occupational Risk Factor	Professional Category		
	Nurse	Technician	Auxiliary
Biological (133)			
Cutaneous / Percutaneous Exposure (72)	15	46	11
Respiratory Exposure (59)	16	37	06
Ocular / Oral Exposure (02)	01	01	00
Subtotal	32	84	17
Psychosocial (133)			
Confrontation with suffering (55)	10	36	09
Lack of teamwork (36)	10	23	03
Violence / Aggression against workers (28)	01	20	07
Insufficient material resources (12)	06	06	00
Unsatisfactory interpersonal relations (02)	02	00	00
Subtotal	29	85	19
Ergonomics (93)			
Required poor posture (56)	15	33	08
Physical stress (31)	09	20	02
Intense pace (04)	02	02	00
Intense physical force (02)	00	02	00
Subtotal	26	57	10
Physical (32)			
Noise (26)	06	18	02
Extreme temperatures (05)	02	03	00
Radiation (01)	00	01	00
Humidity / Vibration (00)	00	00	00
Subtotal	08	22	02
Chemicals (19)			
Glutaraldehyde (10)	04	06	00
Unspecified (05)	01	02	02
Plaster dust (04)	00	04	00
Subtotal	05	12	02

Interestingly, the biological and psychosocial risk factors were equally identified (133 - 32.4%). Next, came ergonomic risks (93 - 22.7%), physical (32 - 7.8%) and chemical (19 - 4.6%). Among biological risk factors, cutaneous-percutaneous exposure was the most common, followed by respiratory and ocular / oral exposure, especially among nursing technicians. The confrontation with suffering, followed by working with reduced staff, and violence and aggression against workers, characterized the occurrence of psychosocial risks.

However, insufficient material resources and unsatisfactory interpersonal relationships were also factors reported by nurses. The most frequently reported ergonomic risk factors were related to poor posture, reported by all, followed by physical stress, excessive work pace, and intense physical effort. The presence of noise, which particularly bothers the technicians, followed by extreme temperatures and ionizing and non-ionizing radiation, were physical risk factors cited by professionals. Among the factors most commonly reported was the risk of chemical exposure to glutaraldehyde, as mentioned by nurses and technicians, and contact with plaster dust, reported by technicians. Some professionals did not specify the substances or products. The nurses perceived their susceptibility to risk mainly to biological hazards, nursing technicians to psychosocial and biological, and nursing auxiliaries to psychosocial. The data relating to occupational accidents indicated that 51.3% (39) of the professionals surveyed have suffered some kind of accident. Of these, 79.5% (31) sharps and / or biological material, and 20.5% (08) reported the occurrence of

fractures and sprains, simple falls, and other impacts. The use of PPE was reported by 89.5% of professionals, highlighting the use of masks, gloves and lab coats (table 3).

Table 3 Use of personal protective equipment reported by a nursing team in outpatient care (n=68)

PPE Used	Responses	
	n = 68	%
Masks	67	98.5
Gloves	62	91.2
Gown/Lab Coat	41	60.3
Eye Protection	14	20.6
Head Cover	13	19.1
Shoe Covers	05	7.3
Hearing Protection	02	2.9

4 DISCUSSION

The age range of study participants is consistent with data from the supervisory body of Brazilian nursing,[16] and working time in the clinic shows that these are experienced professionals. This results follow the profile of population aging and also bear similarity to a study conducted in as outpatient clinic of a university hospital in São Paulo, which identified the health problems caused by exposure to physiological burden (present when performing daily work activities), the Body Mass Index of nurses, and the impact thereof on quality of life of nursing professionals.[10] There is also a general perception that work at outpatient services requires less physical effort, and for that reason, older professionals or professionals with physical limitations (lifting, repetitive strain, spinal column injuries) are placed there. Additionally, remember that the majority of employees of the outpatient clinic come from other services, and have already been exposed to different workloads, some of which may have affected their ability to do their jobs.[10] The fact that the majority of the study participants are women is cultural, because historically, nursing is a predominantly female profession. Despite subtle changes in recent years with the inclusion of males in the profession, females are still predominant. However, this fact may further contribute to fatigue, as these same women also, culturally, perform home and childcare duties.[10] Nursing professionals perform a variety of patient care activities, including handling of blood, preparation and administration of medications, wound care, cleaning surgical and non-surgical instruments, aid in invasive medical procedures, and others with potential exposure to occupational hazards that can cause serious health problems.[17] Considering that there are numerous procedures performed by the nursing staff that require physical strength, the issue of gender becomes relevant in investigations of physical health,[18] and evidence shows that there is a higher frequency of musculoskeletal disorders among women.[19] The double shifts evidenced in this study becomes

triple, if women's domestic activities are included. In the long term, professional and personal demands that "take their toll" and contribute physical and psychological fatigue, must be taken into account.[20] Combine these factors with the higher average age of professionals working in outpatient services, and the concerns here become far more serious. It is noteworthy that the workload is often also a result of double or triple employment, which can cause chronic physical and mental exhaustion and fatigue, and decrease time for the family and leisure. A study in southern Brazil considered some important current political discussions about the workload of nurses seeking to reduce the workload to thirty hours per week, but considered only that this reduction would not prevent the continued demand for double or triple employment.[5] This demonstrated no need to include discussions regarding working conditions, compensation, and value of workers, since professional fatigue is not limited to the weekly workload.[14] The results of this study also highlight biological and psychosocial risks. These findings differentiated this study from other research. The psychosocial risks are not broken down in detail in Brazilian legislation, and also not in healthcare services, as they are not given the same weight as physical, mechanical, biological, chemical and ergonomic risk factors present in the Regulatory Standards of the Department of Labor.[21] The presence of psychosocial risk factors was reported by study participants, arising mainly from day-to-day interactions with suffering people. This is just one aspect that has been valued in current studies.[5, 22] Often the psychosocial aspects are underestimated in the research, when compared to the physical demands.[12] However, these risk factors exist. Other studies have also identified the work of reduced staff, insufficient resources, and unsatisfactory interpersonal relationships and psychosocial risk factors, such as was found in this study.[5, 12, 13, 20, 23] Other psychosocial risk factors found here concerned with healthcare professionals and violence involve both physical and verbal aggression in the workplace, perpetrated by staff members or patients, and these were also described in other studies.[24, 25] In the present study, the impact of ergonomic, physical and chemical hazards was low relative to biological and psychosocial risk factors. Another investigation found that although the biological risk has been identified as the primary risk factor, it was followed by physical, chemical and ergonomic risks.[14] Biohazards are generally the most cited in numerous publications in Brazil, including outpatient care units.[2, 3, 26] This occurs because the risk of contact with biological material to be part of the job of the nursing team, and the direct and continuous contact with patients and the type and frequency of procedures that the nursing professionals perform. This favors exposure to blood, excretions / secretions and / or body fluids, which becomes a concern for the possibility of contact with pathogens. The fact that nurses have more workers than the other teams makes it even more likely.[2] Professionals mainly mentioned the possibility of sharps injuries, which occurs in most studies[8, 14, 22] and has drawn

the attention of researchers on this topic, which highlights the inappropriate behavior of staff.[27] This type of accident occurs also in outpatient units, primarily in clinical services, involving dressings, immunization and minor surgeries.[5] There is great concern with regard to exposure to bloodborne pathogens such as Hepatitis B virus, Hepatitis C virus, and HIV/AIDS, the possibility of the outcome being lethal. Accidents with contaminated material have both physical and mental health impacts on professionals, and may lead to psychosomatic reactions, pending the results of serological tests. Repercussions related to the bio/psychosocial aspects, as well as the incident itself, affect the family and society, generates costs to the pension plan and the employer.[26] Many accidents could be avoided by the adoption of standard precautionary measures, such as not recapping needles and properly disposing of sharps waste.[22, 27] Regulatory standard NR-32 establishes safety rules to reduce occupational hazards in health services in Brazil.[7] Unfortunately, these rules are not always followed, which increases the risk especially when it involves sharps.[3, 27] In terms of ergonomic hazards, there were numerous references to poor posture by professionals. This study was performed in outpatient care, but also noted uncomfortable / awkward positions involved in the practice of nursing, as well as with constantly working “on their feet.” In general, musculoskeletal complaints predominate because the physiological loads are responsible for fatigue, causing absenteeism and significant negative effects on quality of life of workers.[10, 14, 18] The high temperature and noise are physical risks referred to herein, and are also reported in other studies.[28] In this case, the most common noise reported in the outpatient service is produced by the hospital laundry, whose location next to the clinic encourages the spread of the noise arising from the discussion of all who pass through there. The high temperature is probably due to poor ventilation, impaired by the structure of the physical building. Physical risks disadvantage working conditions throughout the environment, making workers less effective; and also prolonged exposure to these risks can lead to the development of occupational diseases of a psycho-physiological nature.[14] Chemical risk was less frequently found in this study. However, the use of chemicals is imperative in health care, for example glutaraldehyde, the most cited, although there are other toxic substances with the potential to generate hazardous waste (antineoplastic drugs, sterilizing and anesthetic gases) that can cause problems to the worker, public health and the environment.[9, 14] Research conducted in southern Brazil found that the chemical and physical hazards are still neglected by nursing staff, and concluded that continuing education focused on updating knowledge of the occupational hazards of this nature is required.[29] The routine use of PPE was not reported by all study participants, which is worrying. This finding is consistent with many studies of nursing professionals, indicating that the perception of risk varies among individuals, being aware of the guidelines and the need to meet regulatory standards such as

Brazilian regulation NR-32.[7] A similar phenomenon was reported in another study,[5] also conducted in outpatient services, that had pointed to erroneous perceptions about the use of PPE; a portion of the subjects understood that the use of PPE eliminated occupational hazards, when really they should be used as a means of protection from the dangers inherent in nursing work. The PPE does not eliminate the environment.[5] It is still important that professionals pay attention to changing habits and behaviors at work to reduce injuries resulting from risks to which they are exposed daily.[28] Preventive measures are important, since risks are preventable and often are associated with the awareness of the professional thereof, which is essential to adopting educational strategies by the healthcare service about the risks and workers' compliance with safety procedures.[5, 10]

5 CONCLUSIONS

The biological risk factors most reported in outpatient care were associated with cutaneous, respiratory, and percutaneous exposure; among psychosocial risk factors, most staff were concerned with psychological distress, reduced staff levels, and violence and aggression. Inappropriate posture and physical stress were the ergonomic risk factors most cited and noise was the most reported among physical risk factors. Chemical risk factors have been linked to exposure to glutaraldehyde and plaster dust. Although almost all the members of the nursing staff at the clinic reported the use of PPE, occupational accidents still occur among them. It is evident that risk of occupational morbidity from infectious disease is present in the practice of nursing. It seems somewhat contradictory to become seriously ill or to die, in taking care of those who are sick. They take care of the patient but do not take care of themselves. One must remember that the work should be a source of pleasure and professional achievement, and not grief and exhaustion. It is suggested that the institution undertake a thorough reassessment of these burdens on nursing professionals, and plan the development of educational programs focusing on preventive measures, special and differential, especially in relation to psychosocial problems and musculoskeletal disorders of workers, to avoid interference with their ability to work.

REFERENCES

- Jansen JP, Morgenstern H, Burdorf A. Dose-response relations between occupational exposures to physical and psychosocial factors and the risk of low back pain. *Occup Environ Med* 2004;61(12).<http://oem.bmj.com/content/61/12/972.long>(accessed 10 Jun 2014).
- Castro M, Farias S. A produção científica sobre riscos ocupacionais a que estão expostos os trabalhadores de enfermagem. *Esc Anna Nery* 2008;12:364-9.
- Mauro MYC, Muzi CD, Guimarães RM, et al. Riscos ocupacionais em saúde. *R Enferm UERJ* 2004;12:338-45.
- Ministério da Saúde, Organização Pan-Americana da Saúde. Doenças relacionadas ao trabalho: manual de procedimentos para os serviços de saúde. Brasília (BR): Ministério da Saúde 2001:1-290.
- Souza NVDO, Pires AS, Gonçalves FGA, et al. Riscos ocupacionais relacionados ao trabalho de enfermagem em uma unidade ambulatorial especializada. *Rev Enferm UERJ* 2012;20:609-14.
- Carvalho BG, Peduzzi M, Mandú ENT, et al. Work and Inter-subjectivity: a theoretical reflection on its dialectics in the field of health and nursing. *Rev Lat Am Enfermagem* 2012;20(1).<http://www.scielo.br/pdf/rlae/v20n1/04.pdf>(accessed 10 Jun 2014).
- Costa AT, et al. Manual de segurança e saúde no trabalho: normas regulamentadoras - NRs. 10th ed. São Caetano do Sul (BR): Difusão Paulista de Enfermagem 2012:1-880.
- Cardoso ACM, Figueiredo RM. Biological risk in nursing care provided in family health units. *Rev Lat Am Enfermagem* 2010;18(3).<http://www.scielo.br/pdf/rlae/v18n3/11.pdf>(accessed 10 Jun 2014). 9. Costa TF, Felli VEA, Baptista PCP. Nursing workers' perceptions regarding the handling of hazardous chemical waste. *Rev Esc Enferm USP* 2012;46(3).http://www.scielo.br/pdf/reeusp/v46n6/en_24.pdf(accessed 10 Jun 2014).
- Sápia T, Felli VEA, Ciampone MHT. Health problems among outpatient nursing personnel with a high physiological workload. *Acta Paul Enferm* 2009;22(6).http://www.scielo.br/pdf/ape/v22n6/en_a13v22n6.pdf(accessed 10 Jun 2014).
- Silva LA, Secco IAO, Dalri RCMB, et al. Enfermagem do trabalho e ergonomia: prevenção de agravos à saúde. *Rev Enfermagem UERJ*. 2011;19:317-23.

- McNeely E. The consequences of job stress for nurses' health: time for a check-up. *Nursing outlook*. 2005;53(6).<http://www.sciencedirect.com/science/article/pii/S0029655405002034>(accessed 10 Jun 2014).
- European Agency for Safety and Health at Work. E-Fact 46: Mental health promotion in the health care sector. 2009. <https://osha.europa.eu/en/publications/efacts/efact46>(accessed 10 Jun 2014). 14.
- Mauro MYC, Paz A, Mauro CCC, et al. Condições de trabalho da enfermagem nas enfermarias de um hospital universitário. *Esc Anna Nery* 2010;14:244-52.
15. Ferreira J, Penido L. Saúde mental no trabalho: coletânea do fórum de saúde e segurança no trabalho do Estado de Goiás. Goiânia: Cir Gráfica 2013:1-675.
16. Conselho Federal de Enfermagem; Comissão de Business Intelligence. Produto 2: análise de dados dos profissionais existentes nos conselhos regionais. Brasília (BR): COFEN 2013. <http://site.portalcofen.gov.br/sites/default/files/pesquisaprofissionais.pdf>(accessed 10 Jun 2014).
17. Arif AA, Delclos GL, Serra C. Occupational exposures and asthma among nursing professionals. *Occup Environ Med* 2009;66(4). <http://oem.bmj.com/content/66/4/274.long>(accessed 10 Jun 2014).
18. Schmidt DRC, Dantas RAS. Quality of work life and work-related musculoskeletal disorders among nursing professionals. *Acta Paul Enferm* 2012;25(5).http://www.scielo.br/pdf/ape/v25n5/en_09.pdf(accessed 10 Jun 2014).
19. Monteiro M, Alexandre N, Rodrigues C. Doenças músculo-esqueléticas, trabaloesqueléticas, trabalho e estilo de vida entre trabalhadores de estilo de uma instituição pública de saúde. *Rev Esc Enf USP* 2006;40(1).<http://www.scielo.br/pdf/reeusp/v40n1/a02v40n1.pdf>(accessed 10 Jun 2014).
20. Camelo SHH, Angerami ELS. Riscos psicossociais no trabalho que podem levar ao estresse: uma análise da literatura. *Ciência, Cuidado e Saúde* 2008;7(2).<http://www.periodicos.uem.br/ojs/index.php/CiencCuidSaude/article/view/5010/3246>(accessed 10 Jun 2014).
21. Serafim AC, Campos ICM, Cruz RM, et al. Riscos psicossociais e incapacidade do servidor público: um estudo de caso. *Psicologia Ciência e Profissão* 2012;32(3). <http://www.scielo.br/pdf/pcp/v32n3/v32n3a13.pdf>(accessed 10 Jun 2014).

22. Chiodi MB, Marziale MHP, Robazzi MLCC. Occupational accidents involving biological material among public health workers. *Rev Lat Am Enfermagem* 2007;15(4).<http://www.scielo.br/pdf/rlae/v15n4/v15n4a17>(accessed 10 Jun 2014).
23. International Labour Organization. Psychosocial factors at work: recognition and control. Geneva: ILO 1986:1-77. http://www.who.int/occupational_health/publications/ILO_WHO_1984_report_of_the_joint_committee.pdf(accessed 10 Jun 2014).
24. Cezar ES, Marziale MHP. Problemas de violência ocupacional em um serviço de urgência hospitalar da cidade de Londrina, Paraná, Brasil. *Cad Saude Publica* 2006;22(1). <http://www.scielo.br/pdf/csp/v22n1/24.pdf>(accessed 10 Jun 2014). 25. European Agency for Safety and Health at Work. E-facts 18: risk assessment in health care. 2007. <http://osha.europa.eu/fop/bulgaria/en/publications/folder.2007-09-21.2042895509/efact18-en.pdf>(accessed 10 Jun 2014).
26. Marziale MHP, Nishimura KYN, Ferreira MM. Riscos de contaminação ocasionados por acidentes de trabalho com material pérfuro-cortante entre trabalhadores de enfermagem. *Rev Lat Am Enfermagem* 2004;12(1). <http://www.scielo.br/pdf/rlae/v12n1/v12n1a06.pdf>(accessed 10 Jun 2014).
27. Brevidelli MM, Cianciarullo TI. Análise dos acidentes com agulhas em um hospital universitário: situações de ocorrência e tendências. *Rev Lat Am Enfermagem*. 2002;10(6). <http://www.scielo.br/pdf/rlae/v10n6/v10n6a5.pdf>(accessed 10 Jun 2014).
28. Silva CDL, Pinto WM. Riscos ocupacionais no ambiente hospitalar: fatores que favorecem a sua ocorrência na equipe de enfermagem. *Saúde Coletiva em Debate* 2012;2(1).<http://fis.edu.br/revistaenfermagem/artigos/vol02/artigo10.pdf>(accessed 10 Jun 2014).
29. Sulzbacher E, Fontana RT. Concepções da equipe de enfermagem sobre a exposição a riscos físicos e químicos no ambiente hospitalar. *Rev Bras Enferm* 2013;66(1). <http://www.scielo.br/pdf/reben/v66n1/v66n1a04.pdf>(accessed 10 Jun 2014).