Original Article

Implementation of Regulatory Standard 32 and the control of occupational accidents*

Implantação da Norma Regulamentadora 32 e o controle dos acidentes de trabalho

Implantación de la Norma Reglamentadora 32 y el control de los accidentes del trabajo

Maria Helena Palucci Marziale[1], Tanyse Galon[2], Flávio Lopes Cassiolato[3], Fernanda Berchelli Girão[4]

ABSTRACT

Objective: To identify work-related accidents with exposure to biological material that occurred in a university hospital, discussing the results with the process of implementation of safety measures and health of workers required under Standard NR-32. **Methods:** This was an exploratory study with a quantitative data approach. A survey was conducted of workplace accidents, the interviews with the coordinator of the Office of Safety and Occupational Medicine, and analysis of documents of the Program of Environmental Risk Prevention and the Program of Control Occupational Health Medicine. **Results:** The percentage of accidents at work decreased over the period, in which various requirements of this standard were being adopted. Needlestick accidents were the most frequent, there being in all sectors of the hospital the offering of safety devices required by NR-32. **Conclusion:** There was a reduction of accidents with biological material in the hospital between 2007 and 2009. However, it is not quantitatively significant, despite the implementation of several guidelines of NR-32 over the years. It requires the collaboration between managers, and safety services and employees in occupational health promotion.
Keywords: Accidents, occupational/prevention & control; Occupational health/legislation & jurisprudence; Exposure to biological agents

RESUMO

Objetivo: Identificar os acidentes de trabalho com exposição à material biológico ocorridos em um hospital universitário, discutindo os resultados com o processo de implementação das medidas de segurança e saúde dos trabalhadores, exigidas pela Norma Regulamentadora NR-32. **Métodos:** Estudo exploratório de abordagem quantitativa dos dados. Foram realizados levantamento dos acidentes de trabalho, as entrevistas com o coordenador do Serviço de Segurança e Medicina do Trabalho e a análise de dados documentais do Programa de Prevenção de Riscos Ambientais e do Programa de Controle Médico de Saúde Ocupacional. **Resultados:** O percentual de acidentes de trabalho reduziu ao longo do período, no qual várias exigências dessa norma foram sendo adotadas. Acidentes com material perfurocortante foram os mais frequentes, não havendo em todos os setores do hospital o oferecimento dos dispositivos de segurança exigidos pela NR-32. **Conclusão**: Houve redução de acidentes de trabalho com material biológico no hospital estudado entre 2007 e 2009. Contudo, não é quantitativamente significativa, apesar da implantação de várias diretrizes da NR-32 ao longo dos anos. É necessária a colaboração entre gestores, serviços de segurança e trabalhadores na promoção da saúde no trabalho.
Descritores: Acidentes de trabalho/prevenção & controle; Saúde do trabalhador/legislação & jurisprudência; Exposição a agentes biológicos

RESUMEN

Objetivo: Identificar los accidentes de trabajo con exposición a material biológico ocurridos en un hospital universitario, discutiendo los resultados con el proceso de implementación de las medidas de seguridad y salud de los trabajadores, exigidas por la Norma Reglamentadora NR-32. **Métodos:** Estudio exploratorio de abordaje cuantitativo de los datos. Fue realizado un levantamiento de los accidentes de trabajo, las entrevistas con el coordinador del Servicio de Seguridad y Medicina del Trabajo y el análisis de datos documentales del Programa de Prevención de Riesgos Ambientales y del Programa de Control Médico de Salud Ocupacional. **Resultados:** El porcentaje de accidentes de trabajo se redujo a lo largo del período, en el cual varias exigencias de esa norma fueron siendo adoptadas. Los accidentes con material punzocortante fueron los más frecuentes, no habiendo en todos los sectores del hospital el ofrecimiento de los dispositivos de seguridad exigidos por la NR-32. **Conclusión**: Hubo reducción de accidentes de trabajo con material biológico en el hospital estudiado entre 2007 y 2009. Con todo, no es cuantitativamente significativa, a pesar de la implantación de varias directrices de la NR-32 a lo largo de los años. Es necesaria la colaboración entre gestores, servicios de seguridad y trabajadores en la promoción de la salud en el trabajo.
Descriptores: Accidentes de trabajo/prevención & control; Salud laboral/legislación & jurisprudencia; Exposición a agentes biológicos

---

** Study conducted in a hospital member of REPAT in the city of Ribeirão Preto (SP), Brazil.*

[1] Full Professor, University of São Paulo at Ribeirão Preto, College of Nursing, General and Specialized Nursing Department, Ribeirão Preto (SP), Brazil.

[2] Doctoral student, University of São Paulo at Ribeirão Preto, College of Nursing, Fundamental Nursing Program, Ribeirão Preto (SP), Brazil

[3] Graduate student, University of São Paulo at Ribeirão Preto, College of Nursing, Ribeirão Preto (SP), Brazil, CNPq

[4] Master's student, University of São Paulo at Ribeirão Preto, College of Nursing, Fundamental Nursing Program, Ribeirão Preto (SP), Brazil

Corresponding Author: **Maria Helena Palucci Marziale**
Av. Bandeirantes, 3900 – Monte Alegre
CEP 14040-902 – Ribeirão Preto – SP – Brasil
E-mail: marziale@eerp.usp.br

Received article **01/08/2011** and accepted **13/12/2011**

INTRODUCTION

The Network for the Prevention of Occupational Accidents (REPAT[1]) was created with the participation of Brazilian and international researchers, undergraduate and graduate students, and occupational health professionals working in hospitals in many Brazilian states to exchange information, conduct collaborative studies, and indicate preventive measures to avoid occupational accidents due to exposure to biological material in Brazilian hospitals. Its actions draw attention to the problem since exposure to biological material may harm health workers due to the possibility of the transmission of bloodborn pathogens, such as hepatitis B and C, and Acquired Immunodeficiency Syndrome[2].

The consequences of occupational exposure to biological material are not only related to infection. Every year millions of health workers are affected by psychological trauma caused by the wait for serological results. Other consequences include altered sexual practices, side effects of prophylactic drugs, and job loss [3].

In Brazil, occupational accidents, occupational diseases, and absenteeism among health workers drew the attention of the Ministry of Labor and Employment (MTE), which, given the numerous requests of entities that represent the various health professions, in 2005 proposed Regulatory Standard NR 32 – Occupational Safety and Health in Healthcare Facilities [4].

NR-32 is considered extremely important in the Brazilian context because, up to that moment, there was no specific federal law addressing occupational safety and health in the health field. The existent laws were included in other standards and resolutions not specifically developed for this purpose.

NR-32 provides that health facilities must implement health promotion, protection and recovery of health professionals working in all activities related to health care delivery [5]. According to the Health and Safety Department of the Ministry of Labor and Employment, NR-32 has three big axes. The first refers to continuous education of workers; the second defines the programs that address risks; and finally, the third determines measures to protect workers from risks[6].

NR-32's basic guidelines are focused on biological, chemical and ionizing radiation risks. The standard also integrates the sanitary law concerning laundry, waste, cafeterias, cleaning and maintenance services, which also should improve. Such requirements are also extended to outsource services aiming to provide better working conditions to these workers as well [4].

New requirements, concerning the Environmental Risk Prevention Program (PPRA), which were originally contained in NR-9[7], and the Medical Control Program of Occupational Health (PCMSO) contained in NR-7[8], were added to NR-32. The staff of the Occupational Safety and Medicine Service (SESMT), which is composed of physicians, nurses, occupational engineers, and occupational safety technicians, is responsible for developing these two programs in hospital facilities.

The PPRA's actions involve the anticipation, recognition, evaluation and control of environmental risks through the supervision of sectors, identification of risks, discussion, and implementation of preventive measures[7]. The PCMSO's main objective is to prevent, screen, and diagnose occupational diseases early on, involving the actions of the entire team, especially the actions of the occupational physician, who individually assesses workers and promotes immunization, among other measures[8]. Actions involving these two programs, such as exams and workplace surveillance, among others, should be performed once a year and whenever accidents occur or working conditions change[4].

The enforcement of NR-32 is expected to improve the promotion of workers' health and prevention of occupational accidents and illnesses[5]. Additionally, understanding of NR-32 and its implications is intended to guide health workers toward the standard's recommendations and enable them to acquire a critical view of occupational health issues in order to perceive that, as active subjects, they have a determinant role in their own lives and health, thus, they need to intervene politically and fight to promote their quality of life at work[9].

Therefore, given the need to look more attentively at NR-32 requirements, this study presents the following guiding questions: What are the frequency and general characteristics of occupational accidents due to exposure to biological material that occurred between 2007 and 2009 in the studied hospital? What are the unproblematic matters and the difficulties faced by the SESMT while implementing the NR-32 guidelines during this period? We expect that this study's results support health facilities in general in planning their own actions.

OBJECTIVE

To identify occupational accidents due to exposure to biological material that occurred in a university hospital in the interior of São Paulo and discuss the obtained results in the face of the process of implementation of occupational safety and health measures required by Regulatory Standard NR-32.

METHODS

This exploratory study with a quantitative approach was conducted in a hospital member of the REPAT located in Ribeirão Preto, SP, Brazil. It is a public and general university hospital, which includes teaching and research activities in addition to health care delivery. This facility is linked to the Brazilian Unified Health System and has a capacity of 851 beds divided into various specialties. The SESMT, active since 1995, is the sector responsible for devising strategies to control and prevent occupational accidents and illnesses, including the development of actions concerning the implementation of NR-32 in the hospital. The service is composed of an occupational physician, an occupational nurse, two occupational safety technicians, an occupational engineer and a secretary.

Data Collection included the following procedures: Identification of occupational accidents with biological material that occurred between 2007 and 2009 among the hospital's workers through the Report of Occupational Accidents and other electronic documents contained in the SESMT's records; semi-structured interviews were held in December 2008 and in December 2009 with the SESMT coordinator in a private room on his workplace premises. The same script was used in the two interviews and included 11 questions based on the NR-32 guidelines: How has the hospital promoted the health and safety of workers? Does the hospital have a PPRA? How was it developed? Does the hospital have a PCMSO? How was it developed? Does the hospital promote the qualification of workers? How? Does the hospital inspect the workplace? How? When and how was NR-32 implemented? What were the measures adopted by the hospital after NR-32 was implemented in regard to biological material accidents? What were the results of these measures in relation to the occurrence of occupational accidents with biological material? What were the difficulties faced in the process of implementing NR-32? And what were the unproblematic matters? What are the challenges faced by the hospital to enforce this standard? A K-7 recorder and tape was used to record the interviews for later transcription and analysis. The SESMT coordinator permitted us to consult the PPRA and PCMSO documents. Data were collected by one of the authors, on the SESMT premises.

Data concerning the accidents that occurred between 2007 and 2009 were analyzed using descriptive statistics to provide the frequency of accidents using Microsoft Excel®. The transcription of the two interviews held with the service's coordinator revealed that answers to all the questions pervaded two general problems experienced by the hospital while implementing the guidelines: "advancements" and "challenges" had been and still are observed and discussed by the institution in the process of implementing NR-32. Hence, "advancements" and "challenges" in the implementation of NR-32 were defined as important categories to discuss the topic. Finally, the data concerning occupational accidents, information contained in the PPRA and PCMSO documents and information provided by the coordinator during the interviews, were compared.

The Ethics Research Committee at the studied hospital approved the study (Process No. 11.440 / 2007). The SESMT coordinator who was interviewed and was responsible for authorizing access to the PPRA and PCMSO documents signed a free and informed consent form. Authorization from the victims of accidents was not required because the occupational accidents were identified through secondary data.

RESULTS

The implementation of the NR-32: advancements and challenges

According to the reports of the SESMT coordinator there are three essential actions for compliance with NR-32:

"I understand that occupational health is composed of three axes: the first is the combination of the PPRA and PCMSO; then, one of these axes is the qualification of workers (…) and in third place is protection equipment, including safety devices, especially for nursing practice…"

The PPRA and PCMSO documents contain records concerning supervision of the work environment and identification of risks, with a description of organizational and environmental measures to be promoted by the hospital's leadership and management. A protocol establishing guidelines in the event of exposure to biological material was also implemented and included medical care provided to workers after the accident. Safety devices, in turn, were not effectively implemented in every hospital sector.

In regard to the qualification and immunization of workers, which is required by NR-32, the coordinator reported that:

"Our main concern is with biological material accidents and the nursing staff is the one most frequently affected by these accidents. Continuous education in the nursing field addresses various issues related to procedures, update the knowledge of employers, and also provides guidance concerning the use of PPE (personal protective equipment) and safety issues…"

"One of the items in NR-32 addresses the immunization program (…) and requires it to be recorded in the worker's medical file; vaccination proof is required (…) including a statement of responsibility from those who refuse vaccination".

He also reported advancements in the quality of accident reporting and the organization of PPE supply:

"...in addition to reporting, accidents were investigated, though in a more informal manner (…) Nowadays, this procedure is documented; the employee fills out a questionnaire at the time of the accident (…) which helps to clarify it."

"One of the actions designed to meet the NR-32 requirements refers to providing a receipt for the PPE provided (…) Now, we give a receipt to the nursing worker (…) confirming s/he has received protective gloves, mask and cap…"

The following stand out among the difficulties faced during NR-32's implementation: the SESMT's reduced staff, the workers' behaviors, and a lack of integrated collaboration among the managers, the SESMT, and workers.

"Listen, the SESMT lacks personnel; the staff was reduced by 50%, which hinders our work toward compliance with some items of NR-32."

"... NR-32 provides the use of closed shoes, no jewelry (…) such as earrings, bracelets; so, the difficulty we face is related to behavior, awareness."

"... only that the document per se is not sufficient for the PPRA (…) the document is not easy to do but it is the easiest part. The difficulty is to implement the actions recommended (…) In order to improve working conditions and reduce risks, I forward our objective to the hospital's board, item per item, our objectives concerning the changes that should be implemented in each work environment."

The distribution of the 258 occupational accidents with exposure to biological material that occurred from 2007 to 2009 among the hospital's workers is presented in Table 1.

According to data provided by the hospital's Human Resources office, there were 4,224 employees in 2007; 4,380 employees in 2008; and 4,470 employees in 2009 exposed to accidents with biological material. Relating the total number of employees with the number of accidents per year, we observe that 2.3% of the workers were victims of accidents with biological material in 2007; 2% in 2008 and 1.6% in 2009.

The greatest number of occupational accidents occurred among nursing auxiliaries (59.7%) followed by nurses, who experienced an increase in accidents between 2007 and 2009. The cleaning staff also experienced accidents (5.8%), while accidents among physicians, physical therapists, and radiology technicians, among others, presented a low incidence.

Table 2 presents information concerning type of exposure, part of the body affected, and the causative agent involved in the accidents.

Table 1 – Distribution of occupational accidents with exposure to biological material that occurred in a university hospital according to profession and year. Ribeirão Preto, SP, Brazil. 2007-2009

Profession	2007			2008			2009			Total	
	NA*	NW**	%	NA*	NW**	%	NA*	NW**	%	n	%
Nursing auxiliary	59	1093	5.4	54	1122	4.8	41	1152	3.5	154	59.7
Nurse	11	350	3.1	11	358	3.1	15	354	4.2	37	14.3
Cleaning auxiliary	9	557	1.6	3	747	0.4	3	705	0.4	15	5.8
Nursing technician	7	159	4.4	5	162	3.1	2	190	1.0	14	5.4
Radiology technician	0	58	0.0	2	58	3.4	0	62	0.0	2	0.8
Maintenance auxiliary	5	106	4.7	2	106	1.9	0	5	0.0	7	2.7
Laboratory technician	2	142	1.4	3	142	2.1	2	147	1.4	7	2.7
Physician	1	428	0.2	2	478	0.4	3	512	0.6	6	2.3
Physical therapist	0	9	0.0	2	8	25	1	8	12.5	3	1.2
Administrative service	1	413	0.2	2	483	0.4	0	515	0.0	3	1.2
Other	3	-	-	4	-	-	3	-	-	10	3.9
Total	98	4.224	-	90	4.380	-	70	4.470	-	258	100

* NA – Number of occupational accidents
** NW – Number of workers at the hospital according to profession.

Table 2 – Distribution of occupational accidents with biological material that occurred in a university hospital according to the type of exposure, causative agent, and body site affected. Ribeirão Preto, SP, Brazil. 2007-2009

Type of exposure	2007		2008		2009		Total	
	Nº	n (%)	Nº	n (%)	Nº	n (%)	Nº	n (%)
Percutaneous	79	80.6	73	81.1	54	77.1	206	79.8
Mucosa	14	14.3	12	13.3	16	22.8	42	16.3
Intact skin	5	5.1	5	5.5	0	0	10	3.9
Total	**98**	**100**	**90**	**100**	**70**	**100**	**258**	**100**
Causative agent	**2007**		**2008**		**2009**		**Total**	
	Nº	n (%)	Nº	n (%)	Nº	n (%)	Nº	n (%)
Needle	54	55.1	59	65.6	40	57.1	153	59.3
Others	26	26.5	17	18.9	4	5.7	47	18.2
Scalpel	8	8.2	4	4.4	6	8.6	18	7.0
Scalpel blade	3	3.1	4	4.4	8	11.4	15	5.8
Unknown	5	5.1	0	0.0	4	5.7	9	3.5
Lancet	1	1.0	2	2.2	3	4.3	6	2.3
No information	0	0.0	1	1.1	3	4.3	4	1.6
Scissors	0	0.0	1	1.1	1	1.4	2	0.8
Drill	0	0.0	1	1.1	0	0.0	1	0.4
Thread	0	0.0	1	1.1	0	0.0	1	0.4
Glass sheet	1	1.0	0	0.0	0	0.0	1	0.4
Razor	0	0.0	0	0.0	1	1.4	1	0.4
Total	**98**	**100**	**90**	**100**	**70**	**100**	**258**	**100**
Body site	**2007**		**2008**		**2009**		**Total**	
	Nº	n (%)	Nº	n (%)	Nº	n (%)	Nº	n (%)
Finger	70	71.4	58	64.4	50	71.4	178	69.0
Eyes	13	13.3	13	14.4	14	20.0	40	15.5
Other upper areas	2	2.0	18	20.0	5	7.1	25	9.7
Face	8	8.2	0	0.0	0	0.0	8	3.1
Lower limbs	5	5.1	1	1.1	1	1.4	7	2.7
Total	**98**	**100**	**90**	**100**	**70**	**100**	**258**	**100**

Percutaneous accidents accounted for 79.8% of the occurrences, then accidents involving exposure of a mucous membrane (eye or mouth), which presented an increase of 8.5% between 2007 and 2009.

Needles were the material most frequently related to occupational accidents, with a percentage of 59.3% followed by scalpels and scalpel blades.

The body sites most frequently affected were the fingers (69.0%). The proportion of accidents involving eyes increased over the years from 13.3% to 20%. Accidents affecting lower limbs also occurred (2.7%).

The records also indicated that the workers, victims of accidents, presented complete immunization against hepatitis B in 91.1% of the occurrences. Immunization coverage among workers increased from 83.7% to 95.7% between 2007 and 2009, while 3.5% of the victims did not receive a single dose of the vaccine.

Information concerning the use of PPE at the time of the accident was not reported in the SESMT records in most of the accidents reported (86.4%). The reason is that the accident report form did not display a space for such notification. This information was provided in only 13.6% of the accidents reports and in 9.3% of cases, the workers were using PPE and in 4.3% they were not.

DISCUSSION

A decrease in the number of occupational accidents was observed between 2007 and 2009 (from 2.3% to

1.6%). It represents a small change in quantitative terms but is relevant in terms of the magnitude and consequences that accidents have for workers and the institution. A study conducted in the University Hospital of Brasilia between 2003 and 2004 reported similar figures in terms of total number of employees exposed to biological material and the number of accidents, with an average of 2.5% of accidents per year[10].

The nursing staff was the personnel who most frequently became involved in accidents from 2007 to 2009. Studies conducted in Occupational Health Referral Centers in Ribeirão Preto and Londrina, Brazil also verified that nursing workers are those most frequently affected by accidents with biological material [11,12]. The cleaning staff was also had victims of accidents (5.8%). According to NR-32, these workers need to be qualified, use PPE, and handle cleaning material and utensils that enable them to preserve their physical integrity; such measures should also cover outsourced workers[4].

The percentage of workers with a complete immunization scheme against the hepatitis B virus (HBV) was high (91.1%), which is coherent with the measures adopted by the SESMT in compliance with the NR-32 guidelines, which stress the immunization of workers as a protective health measure. The Centers for Disease Control and Prevention (CDC) in the United States of America estimated that the current number of health workers infected by HBV was reduced by 95% since the vaccine became available in 1982, from 10,000 cases in 1983 to less than 400 cases in 2001 [2].

Percutaneous accidents presented the highest percentage (79.8%) of occurrences from 2007 to 2009 and needles appear as the main (59.3%) causative agent involved in these accidents, though both types of accidents decreased over the period. We also verified that needles and syringes with safety devices were not implemented in every facility sector, as provided in Decree No. 939, November 18th 2008[13], which complements NR-32. According to the standard, employers should replace piercing materials with others that have safety devices and workers should be qualified to use the new equipment[13]. According to the CDC, safety devices were essential in the reduction of occupational accidents in the USA and Canada and its impact on the reduction of occupational accidents should be considered[14].

The percentage of accidents involving the exposure of eyes to biological material increased between 2007 and 2009, though the SESMT reports that PPE, such as protective glasses and masks, are provided to workers who sign a receipt, in addition to continuous training to properly use the equipment. Even though qualification is an important element in influencing the occurrence of fewer occupational accidents, a study conducted in six hospitals in the Federal District, Brazil reported that knowledge and the adherence of health workers to protective barriers were not significantly related, showing that professionals do not adhere to safety measures despite their knowledge of risks[15]. NR-32 recommends workers not wear jewelry or other ornaments, open shoes, or smoke or eat in working stations[4]. However, as reported by the coordinator, there is a low rate of adherence to these guidelines. We verified that lower limbs were the body parts affected in 2.7% of the investigated occupational accidents. These accidents could have been avoided or minimized with the use of PPE such as closed shoes.

Given the low rate if adherence of workers to safety measures, actions need to go beyond health education and focus on the understanding of behaviors and factors of organizational and social groups influencing such behaviors. The culture of blaming workers for the occurrence of accidents should be overcome, since there are other factors that condition workers to adopt unsafe measures at work. A qualitative study of the testimonies of victims of accidents with biological material reported that not only did a lack or attention or "carelessness" of workers influence the occurrence of accidents, but also inadequate material and equipment, being in a hurry, and work overload contributed to accidents[16].

The quality of accident reporting remains a problem to be overcome by health services. If the report does not include the simple information whether any PPE was being used at the time of the accident, the SESMT and the institution are unable to efficiently direct their actions. The coordinator reported that, in 2009, the hospital implemented a complete form to formally record accident assessment, which shows the initiative of the service aiming to improve the quality of accident reports.

The National Notifiable Diseases System – SINAN[17] was created in Brazil to gather information from the entire country. The system provides a specific form on-line for the reporting of occupational accidents with biological material. Another initiative that can also help to improve the quality of reports is the REPAT[1]. It enables the safety services in Brazilian hospitals to register and report accidents online through a data collection instrument also available on its website. Its use can enable a complete evaluation of the accident and the development of efficient measures to promote the health of workers.

A crucial aspect to effectively promote, prevent and control occupational accidents with biological material was mentioned by the interviewee: it is not sufficient that PPRA and PCMSO provide complete documents. The full support of the institution, as well as from its various managers, is essential for changes to be efficiently implemented. A study conducted with nursing workers identified testimonies addressing the need for nursing management support, so that occupational health and safety are effectively ensured[18].

A reduction of 50% in the SESMT staff of the studied hospital was reported, showing that this issue needs to be valued and prioritized in health services. According to the International Labor Organization's public recommendation provided in 2006[19], in addition to all the occupational health measures traditionally implemented, there is a need for a procedural construction of occupational safety and health culture in the various work environments.

If the subject "occupational health and safety" is not part of the constant dialogue held between hospital managers and workers, if the subject has a connotation of expenditure for the institution and punishment for workers, then merely complying with standards and regulations will not be sufficient to change the context of occupational accidents. There are other social determinants and conflicts within and without the boundaries of the workplace that need to be discussed and considered, as well as measures that will be effective for the health and safety of workers.

CONCLUSION

The number of occupational accidents with biological material occurring in the studied hospital between 2007 and 2009 were reduced. Such a reduction is not, however, quantitatively significant, despite the many NR-32 guidelines implemented over the years.

Successful experiences concerning compliance with the standard involved the qualification of workers, immunization, modification of the work environment, supplying PPE, appropriate accident reporting, and treatment being provided to workers after exposure. The difficulties found were related to reducing the SESMT staff; the need for managers to effectively adopt the measures proposed by the SESMT; non-adherence of workers to the standards; and non-implementation of safety devices in all the hospital's sectors.

The support and involvement of managers, safety services, and the workers themselves need to be effective. A health and safety culture needs to be adopted by the workers, while the factors interfering in occupational safety should be addressed in order to promote opportunities to address and value worker safety within hospitals and to create healthier and health-promoting environments.

ACKNOWLEGMENTS

To the CNPq for financial support provided.

REFERENCES

1. Rede de Prevenção de Acidentes de Trabalho com Exposição a Material Biológico em Hospitais Universitários do Brasil – REPAT [internet]. Ribeirão Preto: Universidade de São Paulo; 2012 [citado 2011 Maio 10]. Disponível em: http://repat.eerp.usp.br
2. Centers for Disease Control and Prevention. Department of Health and Human Services. Exposure to blood: what healthcare personnel need to know. [internet]. 2003 [cited 2010 Dec 6]. Available from: http://www.cdc.gov/HAI/pdfs/bbp/Exp_to_Blood.pdf
3. Heinrich J. Occupacional safety: Selected Cost the Benefit Implications of Needlestick Prevention Devices for Hospitals. United States General Accounting Office [internet] 2000 [cited 2008 dez 2]. Available from: http://www.gao.gov/new.items/d0160r.pdf
4. Brasil. Ministério do Trabalho e Emprego. Portaria nº 485, de 11 de novembro de 2005. Aprova a norma regulamentadora nº 32 (Segurança e saúde no trabalho em estabelecimentos de saúde) [Internet]. Diário Oficial da República Federativa do Brasil, Brasília(DF); 2005 Nov 11 [citado 2010 Ago 25]. Disponível em: http://www.mte.gov.br/legislacao/normas_regulamentadoras/nr_32.pdf
5. Robazzi ML, Marziale MH. [Regulatory standard 32 and its implications for nursing workers]. Rev Latinoam Enferm. 2004; 12(5): 834-6. Portuguese.
6. Brasil. Ministério do Trabalho e Emprego. Área de saúde ganha mais segurança contra contaminações [internet]. 2012 [citado 2007 Mar 20]. Disponível em: http://www.mte.gov.br/noticias/conteudo/12679.asp
7. Brasil. Ministério do Trabalho e Emprego. Portaria n° 25, de 29 de dezembro de 1994. Altera o texto da Norma Regulamentadora n° 9 – Riscos Ambientais [Internet]. Diário Oficial da República Federativa do Brasil, Brasília(DF); 1994 Dez 29 [citado 2008 Ago 25]. Disponível em: http://www.mte.gov.br/legislacao/normas_regulamentadoras/nr_09_at.pdf
8. Brasil. Ministério do Trabalho e Emprego. Portaria n° 19, de 9 de abril de 1998. Altera Norma Regulamentadora n°7 – Programa de Controle Médico de Saúde Ocupacional [Internet]. Diário Oficial da República Federativa do Brasil, Brasília(DF); 1998 Abr 9 [citado 2008 Ago 25]. Disponível em: http://www.mte.gov.br/legislacao/normas_regulamentadoras/nr_07_at.pdf
9. Marziale MH. Contributions of nurses to the field of labor in promoting workers' health. Acta Paul Enferm. [Internet]. 2010 [cited 2011 Aug 11]; 23(2): [about 2p]. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0103-21002010000200001&lng=en.
10. Marziale MH, Silva EJ, Haas VJ, Robazzi ML. [Accidents involving biological material in a hospital from the Network on Work Accident Prevention – REPAT]. Rev Bras Saúde Ocup. 2007; 32 (115):109-19. Portuguese
11. Chiodi MB, Marziale MH, Mondadori RM, Robazzi ML. [Accidents reported at the Workers' Reference Center in Ribeirão Preto, southeastern Brazil]. Rev Gaúcha Enferm. 2010; 31(2): 211-7. Portuguese
12. Spagnuolo RS, Baldo RC, Guerrini IA. [Epidemiological analysis of accidents with biological material reported to the Worker's Health Reference Center in Londrina-PR]. Rev Bras Epidemiol. 2008; 11(2):315-23. Portuguese
13. Brasil. Ministério do Trabalho e Emprego. Portaria nº 939, de 18 de novembro de 2008. Publica o cronograma

previsto no item 32.2.4.16 da Norma Regulamentadora n.º 32 (NR 32) [Internet]. Diário Oficial da República Federativa do Brasil, Brasília(DF); 2008 Nov 18 [citado 2009 Dez 9]. Disponível em: http://www.mte.gov.br/legislacao/portarias/2008/p_20081118_939.pdf

14. Centers for Disease Control and Prevention. Workbook for designing, implementing, and evaluating a sharps injury prevention program [Internet]. Department of Health and Human Services [internet] [cited 2008 Dec 6]. Available from: http://www.cdc.gov/sharpssafety/pdf/sharpsworkbook_2008.pdf
15. Caixeta RB, Barbosa-Branco A. [Work-related accidents in health care workers from public hospitals in Brasilia, Brazil, 2002/2003]. Cad Saúde Pública [Internet. 2005 [cited 2012 Jul 20]; 21(3): [about 9p]. Portuguese. Available from: http://www.scielo.br/pdf/csp/v21n3/07.pdf
16. Damasceno AP, Pereira MS, Silva e Souza AC, Tipple AF, Prado MA.. [Occupational accidents with biohazards: the perception of the injured worker]. Rev Bras Enferm. 2006; 59(1):72-7. Portuguese
17. Brasil. Ministério da Saúde. Portaria n° 777, de 28 de abril de 2004. Dispõe sobre os procedimentos técnicos para a notificação compulsória de agravos à saúde do trabalhador em rede de serviços sentinela específica, no Sistema Único de Saúde – SUS [internet]. Diário Oficial da República Federativa do Brasil, Brasília(DF); 2004 Abr 28 [citado 2008 out 12]. Disponível em: http://dtr2001.saude.gov.br/sas/PORTARIAS/Port2004/GM/GM-777.htm
18. Gallas SR, Fontana RT. Biosecurity and clinical care nursing: contributions for the promotion of worker's health. Rev Bras Enferm. 2010; 63(5):786-92.
19. International Labour Organization. Recommendation R197 concerning the promotional framework for occupational safety and health [internet]. Ginebra: International Labour Organization; 2006 [cited 2008 Nov 14]. Available from: http://www.ilo.org/dyn/normlex/en/f?p=1000:55:0::NO::P55_TYPE,P55_LANG,P55_DOCUMENT,P55_NODE:REC,en,R197,/Document