

Adherence to standard precautions among nursing professionals exposed to biological material***Adesão às precauções-padrão entre profissionais da enfermagem expostos a material biológico**

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* Extracted from the Doctoral dissertation "*Adesão às Precauções-Padrão de profissionais de enfermagem de um hospital universitário*" (Adherence to standards precautions for nursing professionals at a university hospital) presented to the Ribeirão Preto College of Nursing, University of São Paulo, in 2011.

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ABSTRACT

This cross-sectional study, developed at a public teaching hospital with 256 nursing professionals, had the aim to: describe occupational exposure events involving potentially infectious biological material among nursing professionals at a teaching hospital and compare the scores of adherence to Standard Precautions (SP). The first stage of data collection was performed using a form with questions regarding the occupational exposure and the psychometric scale "Adherence to SP"; in the second stage, and upon the participants' consent, the medical records of the exposed professionals were analyzed. Adherence to SP was assessed as high and intermediate, according to the answers to the scale items. There was no statistically significant difference between those who had been exposed or not to biological material. The results evidence that only the use of the scale of adherence to SP was not enough to contemplate all factors that may be associated with occupational exposure to biological material.

Descriptors: Universal Precautions; Occupational Risks; Accidents, Occupational; Occupational Exposure.

RESUMO

Estudo transversal, realizado em hospital público de ensino, com 256 profissionais de enfermagem, cujos objetivos foram descrever as exposições ocupacionais envolvendo material biológico, potencialmente contaminado, entre profissionais de enfermagem de um hospital universitário e comparar os escores de adesão às medidas de Precauções-Padrão (PP). Na primeira etapa da coleta de dados, utilizou-se um formulário com questões referentes à exposição ocupacional e à escala psicométrica "Adesão às PP"; na segunda, a partir do consentimento dos participantes, foi realizada consulta em prontuários dos profissionais expostos. A adesão às PPs foi avaliada como alta e intermediária, segundo as respostas dos itens da escala. Não houve diferença estatisticamente significativa entre os expostos ou não ao material biológico. Evidenciou-se que somente o uso da escala de adesão às PPs não foi suficiente para contemplar todos os fatores que podem estar associados à exposição ocupacional com material biológico.

Descritores: Precauções Universais; Riscos Ocupacionais; Acidentes de Trabalho; Enfermagem; Exposição Ocupacional.

INTRODUCTION

Occupational exposure involving potentially contaminated biological material constitutes a risk to health professionals, especially those in nursing, who provide direct care to patients, frequently handling sharp objects and body fluids.

Many pathogens can be transmitted to health professionals⁽¹⁾ as a result of their work activities, and the human immunodeficiency virus (HIV), and hepatitis B (HBV) and C (HCV) have the greatest epidemiological relevance.

In Brazil registration of the first case of occupational HIV infection was diagnosed in a nursing assistant in 1994 and was the result of percutaneous exposure involving blood⁽²⁾. Four other cases of HIV transmission in relation to nursing professionals have been documented in research and had common characteristics where percutaneous exposure to blood was involved⁽³⁻⁴⁾.

Nursing professionals are described in the literature as the most exposed to accidents involving biological material⁽²⁻⁶⁾, especially in situations of percutaneous exposure when administering venipuncture and medication⁽⁷⁻¹⁰⁾.

In order to minimize the risk of occupational exposure to potentially contaminated biological material, various security measures have been established in health services, including the Standard Precautions (SP), i.e., a set of effective primary prevention measures to reduce the risk of transmission of blood-borne pathogens and body fluids⁽¹¹⁾.

SP measures apply to any patient, regardless of the clinical or serological diagnosis, and personal protective equipment (PPE) such as medical gloves, aprons, surgical masks, and eye protection are recommended whenever contact with body fluids is anticipated. To reinforce these measures, hand washing before and after contact with patients and organic fluids, disposal of sharp materials in rigid containers, and using caution when reprocessing materials and administering injectable drugs are recommended⁽¹¹⁻¹²⁾.

Although SP measures are identified by the scientific community as one of the most important and effective pre-exposure preventive measures for biological material, there is still poor compliance by health professionals⁽¹³⁻¹⁴⁾.

Given this context, this study aimed to compare adherence to SP scores among nursing team members who had or had not suffered occupational exposure in a teaching hospital, and describe the characteristics of these exposures in relation to the type, object, body fluid involved, and use of PPE at the time of the accident.

METHOD

This is a cross-sectional study conducted in the period 2009-2010, in a large teaching hospital in the interior of São Paulo state.

The reference population consisted of 590 nursing professionals, located in clinical medical, surgical, obstetrics, and intensive care (ICU) units. Through sample calculation ($\alpha=0.01$, effect size=0.08, test power equal to 0.99), 290 subjects were estimated. In this study, 256 professionals participated (100%); 178 (69.5%) were nursing assistants, 51 (19.9%) nurses, and 27 (10.5%) nursing technicians, with a loss of 11.7%.

Inclusion criteria considered were: having served at least six months in the institution; performed procedures involving body fluids; and, in the case of nurses, be an assisting nurse, the function of whom is described as being on the first hierarchical level of the nurse in the hospital of the study. As exclusion criteria, professionals who exclusively perform bureaucratic activities, were on indefinite sick leave, or away for any other reason in the data collection period were excluded.

For the first stage of data collection a semi-structured questionnaire containing demographic variables such as gender, age, professional category was applied to all participants during the work shift, at the most opportune moments. The following closed questions were asked: "Have you suffered occupational exposure to biological material in recent years? Have you sought medical care?"

The psychometric scale “Adherence to Standard Precautions” was also included⁽¹⁵⁾.

The “Adherence to Standard Precautions” scale was translated and validated in Brazil⁽¹⁵⁾ by means of cross-cultural adaptation, and was applied to the subjects of this investigation with the permission of the authors. This scale is a type of Likert scale and is composed of 13 items, each with alternatives ranging from 1 to 5 points.

The scale has specific items in relation to the use of PPE, such as disposable gloves, goggles, and aprons, that are evaluated items on the “Adherence to SP” scale, and also a total score where the SP membership levels are calculated according to the average of the simple average scores for each item. These are classified as: a) high – average scores equal to or greater than 4.5; b) intermediate – for average scores with values between 3.5 and 4.49; and c) low – for average scores below 3.5⁽¹⁵⁾.

The second step was composed of consulting the records of nursing professionals to identify the variables of occupational exposure to biological material, such as type of exposure, object involved, and use of PPE at the time of the accident.

The pilot study was conducted with 95 nursing professionals working in various sectors of the hospital where the study was performed.

The variables of the instrument were coded and cataloged in a dictionary (codebook). Data were double-entered into an Excel spreadsheet for Windows 2003 and, after correcting typing errors, were transported to the Statistical Package for Social Sciences (SPSS), version 15.0.

A descriptive statistical analysis to characterize the sample and occupational exposures was performed,

including the following statistical tests: a) Cronbach’s alpha; b) the Kolmogorov-Smirnov test for normal distribution of the average scale scores in groups where the number of subjects is less than 30; c) ANOVA (Analyses of Variance), to analyze the difference between the average scores of adherence to SP between professional nursing categories; and, d) Student’s t test to compare the adherence to SP scores and exposure to biological material.

The research project was approved by the Research Ethics Committee of the Clinical Hospital of the Faculty of Medicine of Ribeirão Preto, University of São Paulo (Protocol 4620/2009), and the ethical aspects were covered. All participants agreed to participate in the two data collection stages.

RESULTS

Of the 256 professionals in the present study, 69.6% were nursing assistants, 10.5% nursing technicians, and 19.9% nurses. There was a predominance of females (78.9%) with a mean age of 38.6 years (range 21.3 to 60.4 years). Most had completed secondary education (64.5%).

Analysis of the scores of the adherence to SP scale showed that 59.4% of subjects reported higher mean scores, i.e., equal to or above 4.5; for 38.3% of the professionals the average score was intermediate, between 3.5 and 4.49 and 2.3% had low scores, i.e., less than 3.5. Analysis of the reliability of the adherence to SP scale had an overall score of 0.70 and was considered satisfactory.

Table 1: Mean score, standard deviation, standard mean error of adherence to SP scale* of nursing professionals who reported not having suffered occupational exposure to biological material and who had exposure records. Ribeirão Preto, SP, 2009-2010.

Registration of occupational exposure	Mean	Standard deviation	Mean standard error
Yes (n=25)	4.516	0.413	0.08279
No (n=187)	4.524	0.413	0.03020

* (Brevidelli; Cianciarullo, 2009)

Professionals who were exposed or not to potentially contaminated biological material were categorized according to their answers and notes in the medical records, and then the analysis of the scores between the groups was performed.

The participants were initially divided into two groups (exposed or not to the biological material), but were subsequently divided into four groups: A – professionals who responded as having suffered occupational exposure in the past two years when answering the questionnaire and who also had such notes in their medical records (n=18); B – professionals who mentioned in the questionnaire that they had suffered exposure but did not have such notes in their medical records (n=26); C – professionals who did not report exposure in the questionnaire but were registered in the medical records as having had exposure (n=25); and D – professionals who did not report exposure and had no such notes in the medical records (n=187).

In the comparison between groups A and B, normal distribution of mean scores in the adherence scale of professionals in groups A (p=0.994) and B (p=0.876) was verified. Differences in scores of adherence to SP (p=0.587) between group A (mean=4.594, SD=0.287) and B (mean=4.527, SD=0.321) were identified, but no differences were observed between the two groups (p=0.587 Student's t test).

Comparing the C and D groups, there was also normal distribution for group C (p=0.755). There was no difference in adherence to SP scores in groups C (mean=4.516, SD=0.41) and D (mean=4.524; p=0.41), and there were no differences between the two groups (p=0.6787 Student's t test).

As for occupational exposures, according to the records, 44 (17.2%) workers had suffered 52 occupational exposures to biological material in the last two years: 80.7% were percutaneous; 17.4% mucocutaneous; and 1.9% not full skin contact. The needle lumen was the object involved in 77.0% of exposures and blood was also present in 77.0% of exposures.

It is noteworthy that 32.7% of exposures occurred during venipuncture; 11.5% in glucose testing; 5.7% in needle recapping; 3.8% in the disposal of sharp objects; 3.8% in the exchange of saline/drip; and 3.8% in the handling of surgical instruments. Regarding the use of personal protective equipment, in 53.8% of exposures professionals did not wear gloves at the time of the accident. In 88.4% of exposures, professionals did not wear goggles. We found no information on the use of an apron in the medical records.

Among the exposures, 42.3% involved needles with a lumen containing blood, and 23% of professionals were not following the use of gloves procedures. Chemoprophylaxis was indicated in 34.6% of exposures. It is noteworthy that any instances of saline conversion, according to data obtained in the record sheets of specialized clinics, were not verified.

DISCUSSION

Analysis of the scale of adherence to SP scores showed that 59.4% of subjects reported high mean scores; for 38.3% of professionals the average score was intermediate; and only 2.3% were low scores. On average the analysis of individual scale items identified that 87.9% of professionals said they "always" use gloves in procedures involving biological material, but it was observed in exposure records that PPE was not used at the time of the accident.

A study performed with nursing professionals in the intensive care units of the same institution obtained an average score for the intermediate "Adherence to SP" scale; however, the authors observed that important items on the scale did not have total adherence, such as proper disposal of sharp materials, hand hygiene after removing disposable gloves, and protective eye wear⁽¹⁴⁾.

In the present study, most of the exposures were percutaneous (80.7%), during venipuncture and performance of the glucose testing. Research conducted in Brazil showed that such needles were involved in percutaneous exposure occurring in a hospital; however,

with the introduction of a disposable and retractable lancet, there was a significant lowering of percutaneous exposures for small-gauge needles among nursing professionals⁽¹⁶⁾.

Of the total percutaneous exposures, 3.8% occurred at the time of disposal and 9.5% when recapping needles with a lumen or peripheral catheter introducer. Such occurrences were also observed in other investigations involving nursing professionals⁽¹⁷⁻²⁰⁾.

According to data from 62,970 reports of exposures to biological material in the state of São Paulo, the use of glove procedures during the time of the accident occurred 74.4% of the time⁽⁷⁾. In the same study it was observed that gloves were used in only 35.4% of cases of drug administration and venipuncture for blood collection, and in 18.9% of cases involving the collection of blood⁽⁷⁾.

Regarding protective eyewear, the records note that they were not used in any mucocutaneous exposures.

In the present study, some professionals reported in the questionnaire that they had suffered exposures but did not seek medical attention; this is also confirmed by the medical records. Other Brazilian studies also found that exposed nurses did not seek medical attention or did not report accidents⁽²¹⁻²²⁾. Research conducted at the

same institution showed that 29.2% of the accidents were not officially reported and that many professionals seeking care at the clinic did not seek engineering, safety, and occupational health services for official notification of the occurrence.

CONCLUSION

Nursing professionals suffered percutaneous and mucocutaneous exposures. Exposure underreporting was identified to verify that professionals who responded as having suffered occupational exposure to biological material had no accident reports in their medical records. The data showed high and intermediate adherence for total scores of adherence to SP scale; however, there were no differences among participants exposed or not to the biological material.

It was demonstrated in this study that the use of only adherence to the SP scale was not enough to cover all factors that may be associated with occupational exposure to biological material. The need exists therefore for further research, such as observational studies that can compare the adherence to SP scores obtained by applying the adherence to SP scale with the adherence of professionals in care practice.

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Received: 06/28/2013.

Accepted: 08//10/2014.

Published: 03/31/2015.