



ASSESSMENT OF THE EXPOSURE OF BASIC HEALTH UNIT NURSES TO BIOHAZARDS

AVALIAÇÃO DA EXPOSIÇÃO DOS ENFERMEIROS DE UNIDADES BÁSICAS DE SAÚDE AOS RISCOS BIOLÓGICOS

EVALUACIÓN DE LA EXPOSICIÓN DE LAS ENFERMERAS DE UNIDADES BÁSICAS DE SALUD PARA LOS RIESGOS BIOLÓGICOS

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ABSTRACT

Objective: to evaluate the exposure of nurses to biological risks in primary care. **Methodology:** a quantitative, exploratory and descriptive study conducted in basic health units in Picos-Piauí, Brazil. The sample consisted of 20 nurses from urban hospitals. The study period was from August 2010 to June 2011, however the data collection took place in April and May, 2011. After reading and signing the Terms of Free and Clear Consent (TCLE), the nurses answered a form that was used as a data collection tool. Then the data was collated in the computer software Excel for Windows and exported to the program Statistical Package for the Social Sciences (SPSS) Version 17.0. The analysis was centred around descriptive statistics (calculating absolute and relative frequencies and measures of central tendencies); the results were organised in tables and discussed with the literature. The research project was approved by the Federal University of Piauí's Ethics in Research Committee and CAAE n° 0471.0.045.000-11. **Results:** it was shown that 90% made use of individual protection equipment. Of the 20% that had an accident, only 5% reported the accident. Some factors that contributed to this under-reporting were due to the relevance of the accident, lack of knowledge of the reporting process and routine protocol. **Conclusion:** continued education on bio-security recommendations and appreciation of preventative actions are important for the health of primary health care workers. **Descriptors:** nursing; occupational hazards; exposure to biological agents; primary health care

RESUMO

Objetivo: avaliar a exposição dos enfermeiros aos riscos biológicos na atenção primária. **Método:** estudo com abordagem quantitativa, exploratório e descritivo, realizado nas unidades básicas de saúde de Picos-Piauí, Brasil. A amostra consistiu em 20 enfermeiros das unidades da zona urbana. O período de realização do estudo foi de agosto de 2010 a junho de 2011, contudo a coleta de dados se deu em abril e maio de 2011. Após leitura e assinatura do Termo de Consentimento Livre e Esclarecido (TCLE) os enfermeiros responderam um formulário que foi utilizado como instrumento de coleta de dados. Em seguida, os dados foram organizados no *software Excel for Windows* e exportados para o *software Statistical Package for the Social Sciences* (SPSS) versão 17.0. A análise centrou-se na estatística descritiva (cálculo de frequências absolutas e relativas e de medidas de tendência central); os resultados foram organizados em tabelas e discutidos com a literatura. O projeto de pesquisa obteve aprovação do Comitê de Ética em Pesquisa da Universidade Federal do Piauí e mediante CAAE n° 0471.0.045.000-11. **Resultados:** evidenciou-se que 90% faziam uso dos equipamentos de proteção individual. Dos 20% que se acidentou apenas 5% realizou notificação do acidente. Alguns fatores que contribuíram para essa subnotificação foram devido à relevância do acidente, desconhecimento do processo de notificação e protocolo de rotina. **Conclusão:** faz-se importante a educação continuada sobre as recomendações de biossegurança e valorização das ações preventivas no âmbito da saúde do trabalhador da atenção primária à saúde. **Descritores:** enfermagem; riscos ocupacionais; exposição a agentes biológicos; atenção primária à saúde.

RESUMEN

Objetivo: evaluar la exposición de enfermeros a riesgos biológicos en atención primaria. **Método:** estudio con abordaje cuantitativo, exploratorio y descriptivo, realizado en unidades básicas de salud de Picos-Piauí, Brasil. La muestra consistió en 20 enfermeros de unidades de la zona urbana. El período de realización fue de agosto de 2010 a junio de 2011, sin embargo, la colecta de datos fue en abril y mayo de 2011. Después de lectura y firma del Término de Consentimiento Libre y esclarecido (TCLE), los enfermeros contestaron un formulario que fue utilizado como instrumento de colecta de datos. Enseguida, los datos fueron organizados usando *software Excel* sea *Windows* y exportados para *software Statistical Package* Sea *the Social Sciences* (SPSS) versión 17.0. El análisis se centró en estadística descriptiva (cálculo de frecuencias absolutas y relativas y medidas de tendencia central); los resultados fueron organizados en tablas y discutidos con la literatura. El proyecto de investigación obtuvo aprobación del Comité de Ética en Pesquisa da Universidade Federal de Piauí, mediante CAAE n° 0471.0.045.000-11. **Resultados:** se evidenció que 90% hacían uso de equipos de protección individual. De los 20% que se acidentaron apenas 5% realizaron notificación del accidente. Algunos factores que contribuyeron para esa sub notificación fueron, relevancia del accidente, desconocimiento del proceso de notificación y protocolo de rutina. **Conclusión:** se hace evidente la importancia de la educación continuada sobre las recomendaciones de bioseguridad y valorización de las acciones preventivas en el ámbito de la salud del trabajador de la atención primaria de salud. **Descriptor:** enfermería; riesgos ocupacionales; exposición a agentes biológicos; atención primaria de salud.

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INTRODUCTION

Primary care is the front door to health system, attending and referring patients as necessary to other health services, requiring more attention from professionals to procedures, since most patients are yet to be diagnosed. More time working in the institution can foster greater adaptation of the professional to the service routine, and therefore a lower rate of adherence to Standard Precautions (SP), which are essential in preventing accidents.

Biological hazards are represented by biological agents, such as bacteria, fungi, bacilli, parasites, protozoa and viruses. These agents are responsible for the greatest number of injuries suffered by health professionals, due to the peculiarity of the tasks performed and exposure to blood and body fluids that can cause infection, in which contamination can occur through dermal, respiratory or digestive means.¹

In Brazil, it has not yet been possible to assess the magnitude of the problem related to occupational accidents with biological material, due to the lack of systematic data on these accidents.² However, needlestick injuries are primarily associated with occupational transmission of hepatitis B virus (HBV), hepatitis C (HCV) and human immunodeficiency virus (HIV). After a contaminated needlestick injury, it is estimated that the risk of infection with HBV is 6 to 30%, with HCV is 0.5 to 2% and with HIV is from 0.3 to 0.4%.³

Based on these, health professionals need to have greater understanding of biosafety norms in their practices; working safely, preventing risks and promoting quality of life.

This study is relevant for nursing because it is the professional category most exposed to such accidents, both in the environment of BHU and hospital, causing sick leave and sometimes disability. Moreover, it is necessary to identify the biological hazards that these professionals are exposed to, also considering the appropriate use of available PPE.

Occupational hazards of nursing work in BHU have not been often addressed in the literature, a fact that prompted this study, whose objective was to evaluate nurses' exposure to biological hazards in primary care.

METHOD

A study with a quantitative, exploratory and descriptive approach. The convenience sample was constituted by 20 nurses who work at the BCU of the urban area of Picos, PI. The period of the study was from August 2010 to June 2011, and the data collection conducted in April and May 2011.

After reading and signing the informed consent form (ICF), nurses responded to a questionnaire that was used as a tool for data collection.

The data was organized in *Excel for Windows*, and then exported to the *Statistical Package for Social Sciences (SPSS)* version 17.0. The analysis focused on descriptive statistics (calculation of absolute and relative frequencies and measures of central tendency) and the results were organized in tables, thus facilitating its interpretation with literature.

The project was submitted to the Ethics and Research Committee (ERC) of the Federal University of Piauí to analyse the ethical and legal issues (autonomy, no maleficence, beneficence and justice) recommended in Resolution No. 196/96 on research involving humans, from the National Health Council,⁴ with approval under protocol No 0471.0.045.000-11.

RESULTS

Following are the results from the survey conducted with 20 nurses from BHU in Picos. Socioeconomic data of nurses was analysed and an assessment of biological hazards was conducted in the unit.

The vast majority of nurses were female (90.0%). It was found that there was no percentage difference between married and unmarried nurses.

Almost all the nurses had the title of postgraduate Lato Sensu (95.0%). The most common specialties were: Public Health (65.0%), Family Health (40.0%), Health Management (15.0%), Intensive Care Unit (15.0%) and Obstetrics (15.0%). Table 1 presents the main data regarding the profile of nurses in the study.

Table 1. Socioeconomic and education data of nurses in Basic Health Units. Picos, 2011

Variables	n	%	Statistics
Sex			
Female	18	90,0	
Male	2	10,0	
Age group			
23 - 30 anos	10	50,0	Average = 32 years
31 - 40 anos	8	40,0	SD = 8.7 years
41 - 55 anos	2	10,0	Median = 30 years
Marital Status			
Married	10	50,0	
Single	10	50,0	
Post-graduation			
Yes	19	95,0	
No	1	5,0	

SD: standard deviation

Table 2. Characterization of basic health units. Picos, 2011

Variables	n	%
Infrastructure		
Organised	6	30,0
Partially organised	13	65,0
Unorganised	1	5,0
Cleanness		
Good	5	25,0
Partially good	14	70,0
Bad	1	5,0
Waste packaging		
Adequate	5	25,0
Partially adequate	12	60,0
Inadequate	3	15,0

Table 2 shows data for the characterization of BHU in the urban area of Picos in terms of physical infrastructure, cleaning and waste packaging.

Regarding the physical structure necessary for the operation of BHU, considered were material resources, equipment and sufficient supplies for the proposed actions for the service. It was found that 65.0% of nurses considered the units where they work partially organized and 30.0% reported that the unit was organized.

Most nurses (70.0%) stated that cleaning of the units where they work was partially good and 25.0% considered it good. With regard to waste packaging in the unit, 60.0% of

participants said that the packaging was partially adequate and 25.0% rated it as adequate.

With reference to the occurrence of accidents with needlesticks, blood or biological secretions, it was found that from the 4 (20.0%) injured, 3 (15.0%) did not report it.

Described in Table 3 are the types of accident and materials involved, the types of PPE used at the time of the accident, the updates on the vaccination schedule against HBV and tetanus (completeness of the diagram) and the moments in which the nurses used the PPE during procedures.

Table 3. Distribution of nurses according to the type and conditions of the accident. Picos, 2011

Variables	n	%
Type of accident and material involved		
No accident	16	80,0
Needle recapping	1	5,0
Lumen needle	1	5,0
Needle stick by third parties	1	5,0
Administration of intravenous medication	1	5,0
PPE		
Gloves, mask	2	10,0
Gloves, mask and gown	15	75,0
Gloves, mask, gown and glasses	3	15,0
Updated Vaccine Schedule		
Yes	19	95,0
No	1	5,0
PPE use during procedures		
Bandage, drainage and injection	1	5,0
Bandage and prevention tests	2	10,0
Prevention tests, bandage and drain removal	1	5,0
Prevention tests, bandage, glycaemia and injection	5	25,0
Prevention tests, bandage, glycaemia, injection and vaccination	5	25,0
Prevention tests, bandage and injection	3	15,0
Bandage, injection, catheter and stitch removal	3	15,0

PPE: Personal Protective Equipment

Regarding the type of exposure of the four victims, the situations that caused the accidents were needle recapping, lumen needle, needlestick by third parties and administration of intravenous medication. It was found that 90.0% of nurses were using PPE, with gloves, mask and gown the most frequent (75.0%).

Concerning the nurse’s vaccination status, 95.0% of these had an updated vaccination schedule.

It was found that nurses considered the use of PPE important in performing preventive cervical cancer tests, bandages, drain removal, blood glucose, injection and immunization.

DISCUSSION

In Brazil, despite the advances in legal or regulatory frameworks, the situation of the indicators of health workers’ exposure to biological agents has numerous gaps, since the risk of accidents of this nature are increasing and present in the activities of health professionals, as a result of poor working conditions in many healthcare institutions. This also occurs due to the increased prevalence of HIV and hepatitis B and C patients. Nevertheless, there is no systematic data in the country at various levels of health care on the occurrence of needlestick injuries, which would allow for the real magnitude of problem to be revealed.⁵

The risks of exposure to biological material in hospital care are well known and measured. However, there are still few studies that address this issue outside the hospital environment, particularly in BHU.

The predominance of females in this study, although expected through the historical situation of nursing associated with this sex, is presented as a risk factor for needlestick accidents. Authors show that women, in general, enter the labour market as a way of contributing to the increase of family income, submitting themselves to double or triple work shift, which causes physical and emotional exhaustion, exposing them to a higher risk of accidents.⁶

In a study on occupational accidents with biological material among health professionals held in the city of Rio de Janeiro, it was found that 85.2% of accidents occurred among female professionals, being the most affected the category of technicians/nursing assistants (54.1%), followed by medicine and dentistry students (10.4%).⁷

As for age analysis, the literature indicates that workers with shorter time in the profession and aged 21 to 30 have a lower frequency of accidents, because they have updated knowledge in training courses and seek to apply it when performing procedures.⁸

Almost all nurses have postgraduate Lato Sensu, highlighting the considerable quantity of professionals with more than one specialization, and this is relevant for a better qualification in the area they operate, which is primary health care. Furthermore, it was found that their expertise was in the areas of Public Health and Family Health, which are directed to work at BHU. Thus, the influence of this kind of qualification in forming nurses conscious about their actions and of the risks brought by their chosen profession is questioned, because this result associates the

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number of nurse casualties (four) with the ones failing to notify the accident (three).

The criteria for evaluating the physical structure of BHU as partially good refers to the structure, which does not comply with what is recommended by the Ministry of Health in the BHU Physical Structure Manual, that is, despite not obeying all the rules, it is still suitable for operating.⁹

The space suggested for the implementation of BHU should be appropriate to local circumstances, the area's population and their constituents, and the number of expected users, as well as providing access for interns and residents from health care training institutions in their learning routine, making the physical structure of BHU a change facilitator in health practices of the Family Health Strategy.⁹

Cleaning and maintenance of the environment structural surfaces are key measures of quality control of BHU. The cleaning process consists of removing dirty matter, which includes the removal of micro-organisms therein and organic matter which promotes their survival and proliferation.⁹

The importance of using PPE while performing the BHU cleaning should be highlighted. The nurse's role in this activity is to educate cleaning employees on the use and purpose of such equipment, encouraging their use, because these employees also have contact with the biological and needlestick waste.

With respect to the partially adequate waste packaging at BHU, its handling, segregation, packaging, identification, internal transportation, temporary storage, treatment, external storage, collection and external transport and final disposal were considered.¹⁰ Waste management should cover all stages of the planning of physical resources, material resources and training of human resources involved in solid health-care waste (HCW) management.

About the quantity of nurses who did not report the needlestick accidents with blood or biological secretions, it is noteworthy that there is a small number of structured units for service and notification of accidents and occupational diseases, as well as a continuing education program aiming to raise awareness among health professionals about the importance of such notifications, monitoring cases and guidance on the risks to which they are routinely exposed.

In Brazil, the occurrence of work accidents must be notified through the issuance of the

Notice of Occupational Accident (NOA) and sent to Social Security, the injured, the union of the corresponding category, the hospital, the Unified Health System (UHS) and the Ministry of Labour.

The underreporting of work injuries among the nursing staff has been identified in hospitals to a point where it reaches levels of concern. In a study performed in a hospital in São Paulo, underreporting was revealed to be in 91.9% of accidents, from which needlestick accidents represented the highest rate (34.4%). Failure to notify these accidents was attributed to the fact that the workers consider the lesions to be very small (53.1%) and to the lack of knowledge about mandatory reporting.

Due to the fact that exposure of all accidents is percutaneous, this result was compared with another study with nurses, whose occurrence of this type of accident ranged from 62.4% to 87.5%.¹¹

Another study identified a higher prevalence in the use of gloves and masks (barrier PPEs). Regarding the use of safety glasses, it was observed that nurses have not forgotten their usefulness, which was mentioned by two respondents, but the nursing technician staff did not remember their importance. Regarding needle recapping, only technicians and assistants mentioned it, while the nurses did not mention this item, which may be related to the fact that these professionals are in the supervision and management of the sectors and not exactly in the administration of drugs and venepuncture.¹²

Hepatitis B is an occupational disease for which prevention is available, free and compulsory for all health professionals through vaccination. During patient care, these professionals need effective protection with a complete vaccination scheme, i.e., in three doses and a subsequent immunological confirmation through Anti-HBs testing.¹³

With regard to the updated vaccination status of almost all nurses, the vaccine against HBV, a key measure to prevent pre-exposure, is extremely effective, with 90 to 95% vaccine response in immunocompetent adults, been freely offered in the public health system since 1995.¹⁴

It is necessary that nurses take ownership of knowledge about the importance of prevention against HBV, both through immunization and by the use of PPE during invasive procedures. Such information should be strengthened, even during graduate

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studies, because studies have shown that knowledge about the contamination by HBV is moderate, and hence the insistence on the immunization of health professionals remains the most effective approach in reducing the risk of acquiring occupational virus infection.¹⁵

It was observed in this study that nurses prioritize the use of PPE mainly in the technical procedures to patient care. And most of the procedures cited by the nurses in this research were conducted in an environment outside the basic health units where they have another work commitment, more precisely in hospitals. These nurses also did not consider that the use of SP is necessary in every patient contact, since this patient does not have an accurate diagnosis in primary care, which is the gateway to the health system.

CONCLUSION

The work of nurses in BHU is surrounded by various occupational risk factors that can cause damage to their health and thus interfere with the quality of care provided to users.

Regarding the assessment of exposure to biological hazards, the objective of the present study, it was observed that occupational accidents suffered by nurses occurred in hospitals.

With this study, it was possible to characterize the BHU nurses of Picos urban area as mostly female, aged between 20 and 30 years, specializing in the areas of Family Health and Public Health, and also to know the physical structure, cleaning, packaging and final disposal of the Unit's biological and needlestick waste.

The results underscore the importance of continuing education on biosafety recommendations and enhancement of preventive actions that underpin the perception of the risk of accidents and consequently improve the worker's quality of life.

It can be also highlighted that there was a small number of reports of accidents, given that these accidents occurred in hospitals, and one of the ways to minimize underreporting is information about the importance and mandatory registration of accidents.

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