

Risks and circumstances of accidents with biological material with the nursing worker

*Riscos e circunstâncias de acidentes com material biológico com o trabalhador de enfermagem**

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RESUMO

Trata-se de pesquisa na área da saúde do trabalhador de enfermagem cujo objetivo foi avaliar os riscos e as circunstâncias da ocorrência de acidentes com material biológico envolvendo trabalhadores de Enfermagem em um Hospital Universitário. O estudo é descritivo, retrospectivo e quantitativo mediante análise de registros de acidentes em unidades de clínica médica num período de 36 meses. Os resultados demonstraram que a categoria mais exposta foi de técnicos de enfermagem (59,46%), o tipo de acidente mais frequente envolveu materiais perfurocortantes (59,46%); o material orgânico mais comum nos acidentes foi o sangue (94,06%) e o turno com maior frequência de acidentes foi o da manhã (43,24%). Verificou-se ainda a existência de descarte inadequado de perfurocortantes (13,51%) como sacos de lixo, bancadas, camas, chão e outros locais indevidos, representando circunstâncias facilitadoras para ocorrência dos acidentes percutâneos. Concluiu-se que os profissionais de enfermagem apresentam dificuldades de acesso ao serviço de notificação dos acidentes e quando essas ocorrem não há clareza quanto a atividade que se exercia. Por fim verificou-se a necessidade de ações de educação permanente junto aos profissionais de enfermagem com vistas a minimização do problema identificado, assim como incorporação de ações preventivas imprescindíveis para se desenvolver práticas mais seguras.

Palavras-chave: Enfermagem do trabalho; Eventos Biológicos; Acidentes de Trabalho.

ABSTRACT

It is a research in the area of the health of the nursing worker whose objective was to evaluate the risks and the circumstances of the occurrence of accidents with biological material involving Nursing workers in a University Hospital. The study is descriptive, retrospective and quantitative by analyzing records of accidents in medical clinics over a period of 36 months. The results showed that the most exposed category was nursing technicians (59.46%); the most frequent type of accident involved piercing materials (59.46%); the most common organic material in accidents was blood (94.06%) and the most frequent accident occurred in the morning (43.24%). There was also an inadequate disposal of punctures (13.51%) such as garbage bags, benches, beds, floors and other improper sites, which are circumstances that facilitate the occurrence of percutaneous accidents. It was concluded that nursing professionals have difficulties accessing the accident notification service and when these occur there is no clarity regarding the activity that was performed. Finally, it was verified the need for continuing education actions with nursing professionals with a view to minimizing the identified problem, as well as incorporating preventive actions essential to develop safer practices.

Keywords: Nursing work; Biological Events; Accidents of Work. Keywords: Nursing work; Biological Events; Work Accidents

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INTRODUCTION

Workers' health is based in a collective health area whose purpose is centered on the health-disease process of workers of diverse population groups in their relation with work, including in this way the nursing professionals.

An important aspect addressed in the discourse on workers' health has been usually presented by researchers in the area and consists of the increasing number of professionals leaving their activities, due to the occurrence of damages caused by accidents at work, especially those with biological material, in addition to the emotional load and the stress generated in these professionals victims of accidents in their work practices, proving to be a public health problem.

Usually, these departures generate losses of several orders, mainly on the other professionals who remain in their activities, starting to bear a greater work load, absorbing the activities performed by the retired professionals, since other disquiet in the health scenarios is related to the inadequate dimensioning of nursing professionals, generally below that recommended by the Board of this professional category.

According to the Brazilian Ministry of Health, work accident is defined as any incident that occurs during the exercise of the profession that causes bodily injury or functional changes that bring loss or decrease, whether temporary or permanent, of the performance of the professional, or that may lead to death ⁽¹⁾. This definition incorporates important concepts that need to be explored to better understand health professionals themselves.

The activities of the nursing team in hospital institutions are usually characterized by the provision of care 24 hours a day, uninterruptedly, allowing continuity of care to patients hospitalized or transiting in health institutions on a temporary basis, without the need for hospitalization. This implies remaining a large part of the workday in direct contact with the patient ⁽²⁾.

The high frequency of accidents with sharps and biological materials has demonstrated the seriousness of the problem for nursing professionals in the hospital environment. In view of this scenario, some preventive and protective measures were created and adopted as a set of measures aimed at the prevention, reduction or elimination of risks inherent in activities ⁽²⁾.

Standard Precautions consist of a set of actions (washing hands after any contact with patients, safe disposal of cutting material, use of gloves, masks, glasses and aprons, covering injured mucous membranes) designed to reduce the risk of contact with blood, body fluids from recognized or non-recognized sources of hospital infection and which should be used regardless of the type of patient's illness ⁽¹⁻³⁾.

Among the risks to which workers are exposed is

the hospital infection, the potential transmission of Acquired Immunodeficiency Virus (HIV), Hepatitis B Virus (HBV) and Hepatitis C (HCV), in addition to other harmful Worker's health. Occupational exposure to biological material causes damage to the physical, mental and social integrity of the accidents, which are frequent among nursing workers⁽⁴⁾.

One of its main recommendations refers to sharp puncture injuries, which should be evaluated immediately after their occurrence and are considered as emergency because treatment must be started as soon as it occurs so that it can be effective⁽¹⁾.

Although health workers know that the risk of accidents with biological material is something real, frequent and know the precautions necessary to minimize them and avoid their consequences, the occurrence rates remain high, requiring further investigation in the scenarios of assistance, especially in those belonging to university hospitals, because in this study, the scenarios under investigation.

Multiple factors may be associated with the occurrence of accidents, however, among the main factors are those related to the inadequacies of work organization, insufficient number of workers, types of work practices adopted, available materials and personal factors. Among the personal factors are: work overload, fatiguing hours, continuity of shift and night shift attendance, physical and emotional exhaustion, poor technical training, lack of attention, overconfidence, stress, and non-adoption of precautionary measures pattern⁽³⁾.

It should be noted that the consequence of occupational exposure to pathogens transmitted by body fluids is not only infection. Many health professionals are affected by psychological traumas that persist for a long time, as well as waiting for serological test results. Among other consequences are the changes in sexual practices, the side effects of prophylactic drugs and the loss of employment ⁽⁴⁾.

The aspect involving the loss of employment is directly related to activities in private units whose work is governed by specific legislation and that employers sometimes give preference to the payment of fines resulting from dismissal, instead of remaining with the professional and promote prevention and permanent education campaigns with a view to limiting the occurrence of new accidents.

As a result of the problem presented, the study was relevant, since it sought to deepen and expand knowledge in this field, since it is already recognized as a public health problem. In the daily clinical practice of nursing professionals, accidents with biological material are an obvious problem and have generated serious consequences in the lives of professionals working in both the public and health systems.

Work accidents with biological material can not be seen as casual phenomena, since their understanding and prevention need a broader and more complex approach. In this perspective, the epidemiological studies that focus on the factors associated with the occurrence of work accidents with biological material, including the institutional and individual factors, that is, the worker itself, can contribute to a better understanding of the processes that determine the occurrence of accidents, as well as subsidies for new research and intervention programs in other social contexts. A justificativa do estudo se deu pela preocupação em reconhecer o problema e reafirmar medidas que possam reduzir suas ocorrências e impactos, tanto de ordem social para a vida dos trabalhadores quanto institucionais e trabalhistas, já que geram repercussões negativas também nos institutos de seguridade.

Therefore, the objective of this research was to evaluate the risks and the circumstances of the occurrence of accidents with biological material involving Nursing workers in a University Hospital.

METHOD

A descriptive, exploratory and retrospective study with a quantitative approach was carried out at a University Hospital located in the city of Rio de Janeiro.

For their analysis, variables expressed in the form of numerical data and statistical resources and techniques were evaluated to classify and analyze them, such as percentages and means⁽⁵⁾. In the exploratory descriptive aspect, in order to observe, record and describe the characteristics of accidents with biological material, the correlation between the variables and the associations between these variables was analyzed⁽⁶⁾.

Como pesquisa retrospectiva, o estudo foi desenhado para explorar fatos do passado, ou seja, acidentes ocorridos em um período de 36 meses, abrangendo janeiro de 2014 a dezembro de 2016, marcando um ponto no passado e conduzindo a pesquisa até o momento escolhido, pela análise documental⁽⁵⁾.

The inclusion criteria were: occurrence of accidents with biological material in medical clinic settings; existence of record of notification of accidents with biological material of nursing professionals in the determined period. No notifications with insufficient information related to the accident involving biological material were excluded.

The data were collected by means of a printed form based on the compulsory notification sheets for accidents with biological material, made available by the Work Accident Notification System with Exposure to Biological Material (SINAN).

Additional information such as socio-demographic information was collected through the same instrument, allowing to trace the socio-demographic profile of the

study population. The forms were filled with information related to accidents with biological material that occurred and were registered at the participating institution, allowing the information to be obtained for joint treatment.

The records identified in medical records, clinical records and documents related to the cases of accidents occurring in a period of 3 years were analyzed, being considered all the attendances related to accidents with biological material and that met the inclusion criteria. The records were made available by the Department of Health (DESSAÚDE), responsible organ in the institution, for the follow up of the cases.

The data were consolidated through the Microsoft® Office Excel® 2010 Program and tabulated and processed electronically for statistical analysis, in which way the information extraction was obtained through simple descriptive statistics to obtain data such as absolute and relative frequencies.

All ethical aspects related to the development of research with human beings were respected, guaranteeing the protection of the rights of research participants, as recommended by Resolution No. 466/12 of the National Health Council, fully submitted to the Research Ethics Committee (CEP) for consideration and obtained its approval through opinion No. 2.144.854. As it was a retrospective study and without intervention to the participants, it was approved by the Research Ethics Committee the exemption of the use of the Informed Consent Term (TCLE).

RESULTS

Data analysis included data from 37 nursing professionals, 15 nurses and 22 nursing technicians, who were involved in medical clinic scenarios and who had accidents with biological material at the University Hospital, the research scenario. Characterized as 32 (86.5%) accidents with female workers and 5 (13.5%) of the male gender.

Regarding the distribution of accidents by professional category of nursing, it was verified that their greatest occurrence is among nursing technicians, corresponding to 22 (59.6%) cases. Accidents were also analyzed from their classifications, involving the type of biological material and the location of the affected body, as shown in the following table:

From the analysis of the information it was sought to verify which task / activity was being performed at the moment of its occurrence, identifying the following distribution.

The shifts were observed in the occurrence of accidents with biological material in order to determine the highest occurrence and the occurrence of 16 (43.24%) was identified in the morning shift, followed by 11

(29.73%) occurrences in the shift of the afternoon and 10 (27.03%) of occurrences during the night shift.

Regarding personal protective equipment, the results show that 35 (94.59%) of the professionals used it and only 2 (5.41%) neglected it. The results, however, point out that the use of some equipment, when analyzed individually, was neglected during the care actions as shown in Table 3.

Regarding the follow-up of the professionals who suffered the accidents, it was verified the need to perform prophylaxis for Hepatitis B and for the Human Immunodeficiency Virus (HIV), since among the accidents occurred serological conversion to hepatitis B was identified in 4 (10.81%) cases and for HIV in 12 (32.43%) cases.

Regarding the post-accident outcomes, it was verified in the records that 19 (51.35%) professionals were discharged from hospital, after confirming that the source was negative and the hospital was discharged to 18 (48.65%) professionals due to non-serological conversion.

DISCUSSION

The greater distribution of accidents occurred in female professionals, during the analyzed period, is related to eminent aspects of Nursing as a profession, since its largest work force is historically constituted by women, which of course justifies the greater proportion of occurrences with the female gender.

The highest occurrence of accidents with biological material among nursing professionals (59.6%) is directly related to the distribution of these professionals, according to the nursing staff dimensioning in the hospital settings. Such a consideration is important, since the distribution of mid- and high-level professionals will depend on the type of unit, according to the classification of care for patients.

Resolution 292/2004 of the Federal Nursing Council, reformulated and published in 2017, indicates that this proportional distribution of professionals is directly re-

TABLE 1 – Distribution of accidents with biological material according to their classification. Rio de Janeiro, RJ, Brazil, 2017.

Type of Accident	FA	FR (%)
Sharpener	22	59,46%
Mucosa (oral/ocular)	11	29,73%
Intact Skin	02	5,41%
Non-intact Skin	02	5,41%
Total	37	100%

Source: research data.

TABLE 2 – Distribution of accidents according to the activity developed. Rio de Janeiro, RJ, Brazil, 2017.

Activity developed	FA	FR(%)
Venous / arterial puncture for blood collection	6	16,22%
Disposal of sharps in an inadequate location	5	13,51%
Venous / arterial puncture, unspecified	3	8,11%
Dextro	2	5,41%
Handling of drill bits	2	5,41%
Surgical procedure	2	5,41%
Intravenous medication administration	1	2,7%
Needle handling	1	2,7%
Others	15	40,54%
Total	37	1000%

Source: research data.

TABLE 3 – Distribution of the use of gloves and masks at the time of the accident. Rio de Janeiro, RJ, Brazil, 2017.

Protective material used	Sim (FA/FR)	Não (FA/FR)	Total
Gloves	30 (81,08%)	07 (18,92%)	37 (100%)
Masks	15 (40,54%)	22 (59,46%)	37 (100%)
Protection goggles	02 (5,41)	35 (94,59)	37 (100%)
Apron	31 (83,78)	06 (16,22)	37 (100%)

Source: research data.

lated to the types of care to be offered, reaching the following distribution relation when it comes to minimum care: 33% of professionals at the higher level and 67% of professionals at the intermediate level. This finding reinforces, among others, for example, the greater presence and consequently greater occurrence of accidents with nursing technicians.

The occurrence of accidents with the group of nursing technicians was significantly higher with sharps (59.46%), which can be justified by the greater number of professionals in this category and also because they perform technical activities with constant use of this type of material, implying greater exposure to the risks of these accidents, which can be confirmed with table 2 presented in the study.

Regarding the circumstances in which accidents with biological material occurred, convergence was found with what the current literature points out, since the practice of nursing, since it involves the handling and manipulation of piercing material, slides, catheters and other products that allow the disruption of the skin layers, leading professionals to a greater susceptibility to the occurrence of accidents, in addition to exposure to biological agents with pathogenic potential⁽⁸⁻⁹⁾.

The most frequent tasks performed at the moment of the accident were venous / arterial puncture (16.22%). This result is related to the practice of the activities performed by the nursing team, in which needles and sharp objects are the materials used to perform punctures, causing the occurrence of this type of accident. As an alternative method to reduce these cases, it would be important to use materials with safety devices required in Brazil by Regulatory Norm NR 32⁽⁹⁾.

It was observed in the research scenario, that there is no predominance of the use of materials with safety devices, however, when they were available, many professionals presented difficulties during their handling, significantly increasing the risk of accidents even with use materials. This situation reinforces that continuing education should be present in all instances, with training and qualification for these professionals.

It should be noted that adherence to recommendations for standard precautions has been the main strategy for worker protection against exposure of transmissible pathogens, but this adherence is below recommended levels. The negligence in the use of protective equipments implies institutional and individual responsibilities and the services must make these devices available according to the risks involved and to the workers it is the proper use and conservation of them⁽⁸⁻⁹⁾.

The literature points out the need for workers' training and awareness about adherence to standard precautions, since these accidents remain frequent and can have serious

consequences for the physical and psychosocial well-being of the worker, as well as a negative impact on health services, as a result of departures from professionals⁽⁸⁾.

Usually the self-confidence, carelessness and haste in doing the nursing actions are factors that contribute to the omission / neglect of the team regarding the use of the PPE's. Many workers also believe that some PPE's hamper the development of the techniques. Sometimes these devices are considered uncomfortable and the incorporation to the use in the services becomes difficult, being essential to offer EPIs that are adequate to the size and the anatomical structure of the health professional⁽⁷⁻¹⁰⁾.

Such a condition can be minimized by conducting studies that develop strategies that help professionals become aware of the risk practices of exposure to occupational infectious diseases, and also by identifying PPE for adequate protection during the exercise of their specific activities. each professional⁽⁹⁾.

We perceive that there are several factors involved in the accident with biological material, one should consider the reality of many institutions and the overload of work on nursing professionals, since there is usually a poor human resources dimension, in addition to the precariousness of material resources / inputs, which may represent a more favorable condition for the occurrence of accidents and also an attribution for the managers, with respect to stimulating the reflection of observed reality.

It is well known that the medical clinic units have a reduced number of nursing staff, which increases the risks and favors the actions performed, usually with recklessness and negligence in caring practices. Thus, there is a dangerous association, such as the accelerated pace of work, the reduced number of workers and the inadequacy of material resources, triggering processes of suffering and illness⁽⁸⁾.

Carelessness and overconfidence seem to be among the major causes of accidents, as most percutaneous accidents occur when certain care is neglected, such as not using the finger to support the needle, not reattaching the needles, remove the used needles with the hands, besides despising all the piercing material in an appropriate container, this measure being an example of collective protection in the work environment⁽⁷⁾.

This is an important and must be rethought, since health education represents an appropriate way to increase the safety of professionals in health care practices and should be stimulated and used to modify the reality of public services health in Brazil.

In view of the above, it is worth noting the importance of evaluating under what circumstances the accidents with biological material occurred, highlighting that the majority of cases of occupational accidents with biological material evaluated in this study occurred by

percutaneous exposure (59.46%) involving blood visible, with emphasis on the needle with lumen as the object that caused the accidents.

Another relevant aspect related to the circumstances in which the accidents occurred is related to the professional's work shift, this because in some shifts there is a much higher frequency of activities and depending on the period this condition can be further exacerbated. The results showed that most of the accidents (43.24%) occurred in the morning shift, followed by the afternoon shift with 11 (29.73%) occurrences and the night shift with 10 (27.03%).

Regarding the disposal of puncturing material, it was found that the same happened in garbage bags or in benches, beds, floors, among other inappropriate places (13.51%), representing circumstances facilitating the occurrence of percutaneous accidents. The major problems generated by the inappropriate disposal of these materials were: improvised collectors due to lack of correct devices, distant location of procedures, waste and / or materials always above recommended capacity, and the presence of needles and others piercing out of the containers, giving an increased risk of accidents⁽¹⁰⁾.

Biological blood material was present in 56.76% of the exposures and is considered the biological material that has the highest Hepatitis B virus titles and is also the main responsible for the occupational transmission of viruses involved in accidents with biological material⁽⁷⁾.

The results presented also highlight the need to prophylaxis of the injured professional, especially in the case of serious diseases such as those caused by hepatitis B and HIV viruses. Such occurrences imply the need for special attention, since many professionals neglect prophylaxis and, in addition, the professional's monitoring by the health institution sometimes does not give the necessary attention to the victim of the accident⁽⁸⁻¹⁰⁾.

According to the post-accident outcomes verified in the results of the study, professionals have received little attention when considering that they were discharged to 19 (51.35%) professionals after confirmation of the source being negative and hospital discharge for 18 (48.65%) by non-serological conversion.

A relevant issue when discussing occupational exposure to biological material refers to pre- and post-exposure prophylaxis. Regarding pre-exposure prophylaxis, the vaccination schedule for hepatitis B can be mentioned. It is also worth noting the importance of all health professionals to have the complete vaccination schedule and consists of three doses of the vaccine. The professionals should present the antibody and consequent vaccine response, however, in some cases the absence of the vaccine response of some workers is noticed.

Health services using antiretroviral chemoprophylaxis

after an accident with HIV exposure need to be organized in terms of post-exposure procedures, care protocols and, in particular, to provide follow-up to the nursing worker. This is because in many cases the injured worker ends up encountering the difficulty of starting, maintaining and completing the recommended prophylactic scheme due to the side effects caused by these medications. It is emphasized that the event generates in the worker feelings of anguish, fear and frustration about the possibility of contracting HIV, which reinforces the importance of accompanying the injured worker⁽¹⁰⁾.

As recommended by the Ministry of Health, the use of chemoprophylactic drugs for HIV is indicated for two situations: when the biological material involved in the accident is of an HIV positive individual or when it is not possible to identify the patient source involved in the accident⁽¹⁰⁾.

From the above, it can be seen that the interest in relation to work accidents with biological and piercing material has been increasing, especially after the 80's, due to the damages and injuries caused to workers' health. However, concomitant with the high occurrence rate, the coexistence of a high underreporting rate is estimated.

In Brazil, the scarcity of systematized data on these accidents does not allow us to know the global magnitude of the problem, making it difficult to evaluate the preventive measures currently used. Among the reasons mentioned for such situations may be: evaluation of the professional that the situation or injury occurred is not a risk, ignorance of the obligation to notify the accident, lack of time due to excessive work or, even the fear of dismissal, bureaucracy and absence of a fixed seat of the commission to record the occurrences⁽⁷⁾.

The notification of exposure to biological material allows health surveillance actions of the worker, because through the data on accidents occurred it is possible to evaluate the most frequent causes and implement preventive measures according to the reality of each place. Without this parameter the managers have difficulties to perceive the real magnitude of the problem pointed out⁽⁷⁻⁸⁾.

During the development of the research, there was a gradual fall in the number of accident records during the three years analyzed retrospectively, which can be explained by the occurrence of a change in the place where the employee must record the occurrences in the institution. The current headquarters of the service responsible for the health of the worker in the institution is further away from the hospital and its operation is limited in relation to the days and times of the week.

It is important to emphasize that when the accident occurs at the time of the non-functioning of this headquarters, the first service is performed in an emergency manner by the ward of infectious and parasitic diseases,

and the professional is oriented to seek the specific assistance service to the worker as soon as possible, which represents one more limitation for the recording of the accident when considering the work regime practiced by the professionals, as in the cases in which they are on call.

CONCLUSION

The study allowed to conclude that the health professionals of the institution where it was developed have difficulties accessing the service of reports of accidents with biological material and that the inappropriate disposal of these materials is a reality in the institution, putting at risk the health of nursing professionals and other health care professionals, including patients and family members.

The lack of clarity in the notifications regarding the specific type of activity performed at the time of the accident was identified as a failure in the notification process, and could have negative consequences, such as the impossibility of developing studies with a view to minimizing the problem.

The circumstances of accidents occurring allow us to infer their direct relationship with the shift of activities, with the morning being the one with the greatest num-

ber of accidents, possibly due to the large number of nursing actions in this period, including correlating with the materials in inappropriate places, and verified variables that contribute to the occurrence of accidents.

It is hoped that the development of the study may contribute to the scenario in which it was developed, considering the availability of the results to the professionals and to the direction of the institution, thus stimulating the development of actions provoking changes on the reality observed, especially with respect accidents with biological material.

The results found may support strategies for professionals in infection control services and permanent education programs to minimize biological risk, since in these places health managers and researchers usually see the insertion of this knowledge into the services.

There was an opportunity to verify and present the daily reality of nursing professionals, as well as the risks faced in their practices, including contributions to teaching and research, in order to stimulate the elimination of dichotomies between theory and practice in care services to health, promoting and incorporating preventive actions essential for a safer performance.

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