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Occupational exposures to biological fluids – rethinking intervention strategies: a qualitative study

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ABSTRACT

Aim: To understand the phenomenon of the experience of an accident with biological fluids according to the nursing staff, with a view to reorganizing the work process. **Method:** This is a qualitative study using the approach of existential phenomenology. Eight nursing workers who had accidents with biological fluids answered the guiding question: “How was your experience of having had an accident with biological fluids?” Their comments were analyzed according to the existential philosophy framework of Martin Heidegger. **Results:** The analysis revealed two categories: “Being-in-the-world’, experiencing an accident with biological fluids” and “Transcendence through work reorganization,” which describe the experience of the nursing workers who had accidents with biological fluids, in addition to the context in which accidents occur, marked by work-overload. **Conclusion:** The results indicate intervention strategies for the reorganization of the work process, fundamental to the reduction of accidents with biological fluids.

Descriptors: Nursing; Occupational Exposure; Biological Factors; Qualitative Research.

INTRODUCTION

The technological and scientific advances in healthcare are unquestionable and have been occurring progressively. However, the improvement of working conditions for nursing workers has not occurred at the same speed, showing a worrying situation in terms of accidents and work-related diseases.

Work accidents reveal workers' exhaustion. When workers suffer an occupational accident, they are exposed to biological loads, due to direct contact with body fluids (through spills, skin piercing or contact with mucosae); mechanical loads, due to cuts and rupture of the skin in cases of sharps injuries; and psychological loads, often subdued by professionals and related to the feelings experienced during and after the accident⁽¹⁾.

In the year 2013 alone, 559,081 occupational accidents were recorded through the Work Accident Report (WAR) in Brazil. The incidents recorded without WAR were 158,830, totaling 717,911 accidents. In the same period, an average of 48 workers per day was excluded from the labor market due to occupational accidents or occupational diseases in the country⁽²⁾.

Regarding the characteristics of accidents among health institutions' workers linked to a Regional Reference Center of Occupational Health, research shows that 52 work-related accidents were recorded; of these, 76% involved blood. Regarding the type of exposure, percutaneous contact accounted for 78.8%. As for the circumstances causing the accidents, 17.4% occurred during the administration of medication; 17.3% due to the manipulation of boxes with perforating objects and 9.6% due to the disposal of sharps in regular trash bags⁽³⁾.

A study in Iran has identified 171 exhibits and found that 32 of the accidents (19%) occurred due to the injured worker having mucosal contact with potentially infectious fluids⁽⁴⁾.

Research that aimed at analyzing 17 work accidents involving biological fluids found that the situations experienced that favored the occurrence of exposures were in greater proportion due to agitated patients at the time of the accident (35.2%); lack of attention and professional care (23.5%); improper disposal of sharps (23.5%) and service overload 17.6%⁽⁵⁾. The international literature shows that the hands are the parts of the body that are most involved in accidents⁽⁶⁾.

The analysis that was aimed at investigating accidents involving biological material among 100 students training at a medical trauma emergency room found that 32 of them had accidents with biological materials. Higher risk activities were the local anesthesia (39.47%), suture (18.42%) and recapping the needle (15.79%). The main routes of exposure to biological material were the contact with eye or mucosa (34%), which occurred via syringe needle in 45% of cases. However, after contamination, only 52% of the accidents were reported to the responsible sector⁽⁷⁾.

Accordingly, the notification of exposures by recording information about the accident is critical to the identification of risk factors and the development of prevention strategies. A survey conducted in a surgical center of a large hospital in São Paulo has identified that, from a total of 261 exposures to biological material, 147 were unreported. Thus, the authors found that the underreporting rate was 55.1%. Among the reasons cited for the failure to report the accident was the fact that the patient was a negative HIV source and the judgment that the accident was of low risk^(8,9). Thus, although the worker's health surveillance is guided in research, analysis and intervention in the processes aimed at health promotion and the prevention of accidents and work-related diseases, it is possible to perceive a gap between theoretical knowledge, its appre-

hension and application focused on preventing these exposures⁽¹⁰⁾.

Although many studies are being carried out, it is noted that the situation is still rather problematic and requires a new look at the work environment, identifying the context of such accidents and proposing effective prevention strategies in the workplace.

OBJECTIVES

To understand the phenomenon of the experience of an accident with biological fluids according to the nursing staff, with a view to reorganizing the work process.

METHOD

This is a phenomenological qualitative study that uses the approach of the existential phenomenology of Martin Heidegger. Phenomenology is a philosophical method that seeks to reveal its meaning to get to what the studied object is through the understanding of a phenomenon⁽¹¹⁾.

The study subjects were eight nursing workers who were victims of work accidents with biological fluids. The only inclusion criterion for the selection of the subjects was having suffered a work accident with biological fluids notified registered in accordance with the current legislation in Brazil up to a maximum period of six months after the incident, respecting the period of care provided to workers, as recommended in the protocol of care in terms of accidents with biological fluids. First, the service specialized in Safety Engineering and in Occupational Medicine providing the list of workers of the nursing staff who have suffered accidents with biological fluids in the last six months. In the list provided

70 workers' names were related, but only 29 presented information, such as telephone contact and work sector.

Initially, we conducted telephone contact with the workers in list, following its sequence. Then, from the acceptance of the worker, a meeting was scheduled according to their date and location available. Data were collected individually between the months of January and February 2014, until the moment at which all concerns were answered. We preserve the identity of the workers by means of fictitious names for identifying each of the speeches. The interviews were recorded on an MP3 player upon participants' prior permission from the following guiding question and we also included an auxiliary question: "How was your experience of having had an accident with biological fluids?"

The project was approved by the Ethics Committee in Research in the School of Nursing, University of São Paulo, Opinion No. 464,028, according to Resolution 466/2012, which regulates research involving human beings in Brazil.

We presented the Informed Consent (IC) for each respondent. This document provides explanations on the survey and ensures confidentiality for the information provided. It afforded the respondent the right to discontinue participation in the project when it was convenient.

The speeches were analyzed by means of transcribing the interviews, reading and rereading them for apprehension and identification of units of meaning, considering the assumptions of the philosophical framework of Martin Heidegger. Thus, we constituted the categories that unveiled the phenomenon of the experience of an accident with biological fluids according to the nursing staff.

RESULTS

The analysis of the comments according to the reference of Martin Heidegger allowed the creation of two categories: "Being-in-the-world experiencing the accident with biological fluids" and "Transcendence through work reorganization," which unveiled the phenomenon *the experience of an accident with biological fluids according to the nursing staff*, with a view to formulating intervention strategies to reduce accidents.

Below are the passages that enabled the composition of the categories:

Category 1 - "Being-in-the-world experiencing the accident with biological fluids"

This category deals with the experience of the nursing workers who had accidents with biological fluids, revealing the anguish, the fear of death, the need for care, the questions in terms of the treatment and the possibility of being contaminated.

After the accident, the workers start to rethink their lives, expressing deep concern, despair and anxieties that oppress them. They feel fear of death and fragility given the magnitude of that event. Anguish, characterized by a mixture of feelings, is shown below:

I got so desperate at the time ... the patient was hospitalized ... I was extremely desperate. For three days I could not forget it for a minute ... a minute ... (Camila)

I leaned against the sink, and felt like crying ... I wanted to cry ... now I don't know what kind of virus she had and my world was over... after twelve hours on duty... it was horrible... (Renata)

The concern for people, the responsibility and the affective bond with children, spouses

and siblings generate a very hopeless feeling for workers, especially regarding the possibility of contamination. The speeches show that, often, they provide sustenance of the house and the accident means the end of work, the loss of vitality:

I kept thinking: "Wow... I'm here risking my life... ours"... oh whatever... and I also thought of my son... I said, "I'm leaving my son at home to risk my life..." (Bruna)

And as I have a sister who is ill and really depends on me... she is schizophrenic... and she depends a lot on me... (Bianca)

This experience is permeated with questions concerning the contamination, uncertainty regarding the results of tests, the possibility of treatment with antiretroviral drugs and even the non-effectiveness of drugs after the accident generate a feeling of weakness, insecurity and fragility, which is present in the descriptions below:

It starts little by little... the adrenaline of that moment goes down... then you think: "Oh, am I contaminated? Is it going to be positive? Will I have to take that bunch of medication? Is it... is it... Is it very difficult"? (Marli)

Nurses' exposure manifests a rethinking in terms of their own lives and the possibility of becoming ill due to the likelihood of contamination by HIV, hepatitis C or B and it brings up a range of feelings related to the possibility of death. Although this feeling has not been pronounced, it is implicit in the following excerpts:

I was very nervous because she had HIV... She was undergoing treatment by collecting liquor every day... She had

meningitis... and she had already had meningitis and had been treating it for two years... So I got really depressed... I had a hell of a depression... (Bianca)

My life flashed in front of me at the time of the accident. I thought, "Now that I have the C or AIDS virus my life could change completely". (Renata)

Workers describe the need for care, such as institutional and emotional support as well as support for all the actions that they will experience. Therefore, having someone to talk to, for support and the rescue of the sense of security and stability that was previously lost is very important. The stories below show the importance of this care:

I needed someone on my side at that time, so Julia*, a nurse, got me out here, put me in another room and said, "Calm down...". And I said: "Calm down?! How?" Then she talked to me, stood by me, supporting me, you know? Having someone to talk to made so much of a difference to me at that time... (Renata)

On the other hand, during this experience some workers experienced a lack of care and impersonality expressed by other members of the staff in relation to the injured colleague, the attribution of blame for the accident and being poorly regarded by team members:

At that moment I felt abandoned, abandoned... Oh, you know, because the nurse was busy with other patients and there were many critically ill patients, including an intubated patient... Then another unconscious patient arrived... And instead of the two doctors who

were discussing the case give me some support they discussed the case facing each other... And then they looked at me as if to say: "Manage it yourself" (Cybele)

It's just that ... Whenever people see you this way, they think you infected yourself on purpose... (Joana)

Therefore, this category is permeated by the emotional stress experienced by workers after the accident, the importance of support and for the care of others in terms of safety and coping with the problem. It also shows prejudice and indifference of co-workers toward the injured worker.

Category 2 "Transcendence through work reorganization"

In this category, the excerpts reveal the time when the accident occurred, highlighting the various failures in the daily work that signal the formulation of strategies aimed at reducing accidents.

The lack of knowledge, difficulties in handling new materials, improper use of sharps boxes and failures in the continuing the education process of the nursing workers are highlighted as important factors in the genesis of accidents, according to the excerpts below:

I had already punctured the patient, but I did not know how to use Jelco, as it was a new catheter... the staff had already had the training, but I was absent on that day, so I ended up not participating... then the accident happened, due to lack of knowledge. (Bruna)

Like the box... I think the lid was misplaced... when I threw the needle-scalp inside the box; it came back and pierced my finger... (Joana)

Some time ago I was puncturing a patient... I was collecting his blood... and when I threw needle-scalp in the punch hole, it turned upwards and stung my finger... (Camila)

As can be seen in the excerpts, the improper disposal of sharps is considered an important factor that is responsible for accidents, especially when associated with the filling of the collection box beyond the recommended limit.

Another reported issue is the use of inappropriate materials and instruments for carrying out the procedures, often due to the scarcity of suitable material, thereby contributing to worker exposure. The following excerpt refers to a worker who was using a needle instead of a lancet to perform the capillary glucose test:

Because, as there was no lancet, I was puncturing with the insulin needle, then she (the patient) hit me; she raised her hand and the needle came back on my finger... (Bianca)

We can also highlight the failure to use personal protective equipment by workers while performing invasive procedures, thus promoting worker exposure to biological fluids:

So, he was placing a central catheter. When he started to draw the blood from the syringe in the area he pressed the plunger of the syringe too hard, so the blood hit the field and came over me. He put a lot of force on the plunger

of the syringe ... and I'm little... in an emergency, when we want to save the patient's life, we often end up failing to use PPE. (Renata)

When I infected myself with liquid? I discarded a probe with that the probe liquid... It fell from my hand, I mean, not the probe, the container; and the liquid spilled and I soaked myself with all that disgusting secretion ... oh, it was awful ... (Joana)

Another factor identified as the cause of exposure to biological fluids is work-overload experienced by nursing workers in health institutions. Due to the high flow of patients and the high demand for services, the speed of execution in the activities leads to decreased attention at the time of the procedures. In addition, the inattention of the team as a whole was also a factor pointed out by subjects:

So, in this last accident I suffered, there was a patient who was in the agitation room. She was a psychiatric patient so I said, "Look, I'll punch your finger to make the dextro (dextromethorphan (DXM) drug test)" Ok ... then the doctor came, entered the room and, while he was talking to her, she raised her hand and pricked my finger. (Bianca)

And when he arrived... I was puncturing the patient, so the doctor leaned on the bed, then the gurney moved and the Jelco entered my hand... hey, the gurney is no place to lean on and cross the leg. I think that his obligation was to help me, since he saw that the patient was bad... (Joana)

Because, in fact, I put the Jelco on the tray and, when I went to get the tape to secure the access, I did not see that it was under the tape, then it jabbed the tip of my finger. (Bruna)

Throughout this category it is noticed that, during the working process of the nursing team in the implementation of activities and procedures, workers are under the influence of many factors that may contribute to the occurrence of occupational accidents involving biological fluids. Overloading, staff shortages, non-compliance with biosecurity procedures in addition to the failure of permanent education, are important factors highlighted by the workers.

DISCUSSION

From the first category identified "Being-in-the-world experiencing an accident with biological fluids", one is able to understand the experience of nursing workers who had accidents with biological fluids; they are marked by anguish, fear of contamination, uncertainties in terms of treatment and the need for care.

This category is interpreted from a Heideggerian perspective, which the man philosopher himself called "being-there" (Dasein), indicating an entity that only exists in this world from the relationships established with other entities. The speeches show the fear of finitude, characterized by the anguish of the nursing staff. According to Heidegger⁽¹¹⁾, distress can be defined as a way of being in the world, as it provides the easiest way to authenticity; it is a kind of ontological nausea that takes over the being-there whenever you come close to understanding the inherent instability of human existence.

In this world, when workers came into con-

tact with other beings after the accident, they reported a need for care, and the management and emotional support from co-workers. "World" is defined as that to which care is dedicated, and "being" as that which dedicates care to the world. You cannot approach authenticity by trying to leave the world as it reveals care as normal⁽¹¹⁾.

Meanwhile, some workers reported the helplessness and prejudice during the experience of the accident, showing the lack of care. The difficulties faced by them reflect the inauthentic or careless care after the occupational exposure. Reckless individuals are related to deficient types of care and this happens when they are not allowed to speak to each other; and they are displaced from their positions, thus becoming dependent and overpowered – even if the area is quiet and remains concealed from the overpowered workers⁽¹¹⁾.

Thus, the prejudice of the engagement team and the social representation that professionals and the hospital have is that the worker is always to blame for the accident. This belief comes from a previously constructed reality, anchored in conformist principles⁽¹²⁾.

Regarding the second category, labeled "Transcendence through work reorganization", it is possible to see that accidents occur in a context marked by work-overload, lack of attention to each other, and the misuse of personal protective equipment.

However, it also showed that factors such as lack of knowledge, inappropriate use of work tools and failure to use personal protective equipment are responsible for most of the accidents⁽¹³⁾.

In the case of the lack of knowledge, this may be related not only to poor training of professionals, but also the failures in the lifelong learning process during the working life.

Thus, the training of nursing professionals arises from a historical context inserted in a

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socio-economic reality guided by the need for cheap labor and little reflective of the terms of their practices. Given the need for rapid integration into the labor market, it is aimed at a superficial education, often far from the reality that they will face in their professional activities. At the same time, the difficulties faced by students during the teaching process (the need to work and study to meet the cost of living) preclude the creation of a solid and reflective background⁽¹⁴⁾.

Continuing education is an important strategy for reducing accidents with biological fluids. The educational approach is a tool capable of providing subsidies for the transformation of reality through the questioning of accidents experienced in daily work. Thus, the discussion of the factors related to their occurrence contributes to risk awareness, leading workers to identify personal challenges and management of service and assistance, with a view to developing a safer work environment⁽¹⁵⁾.

Often it is observed that nursing workers underestimate the risks they are exposed to when they develop their work routines, such as not wearing gloves for performing venipuncture and the absence of the use of mask and goggles while running procedures such as urinary catheter and endotracheal aspiration, which are simple practices in health institutions. Surrounded by an exhausting routine, the security provided by years of familiarity makes workers little reflective regarding the importance of the use of personal protective equipment for their health.

A survey revealed the distribution of occupational accidents involving exposure to biological material among workers at a teaching hospital and found that, of the total of 55 recorded accidents, the causes listed in descending order were the lack of attention of co-workers in 8 cases (14.3%); speeding and

the non-use of PPE in seven events (12.5%), lack of attention in 6 (10.7%); unsuitable material in 5 (8.9%); patient motion in 4 (7.1%); and full waste container 2 (3.6%)⁽¹⁶⁾.

The awareness among workers regarding the use of personal protective equipment can be developed through educational practices in workshops where the employee can handle the equipment, resolve questions in terms of correct usage and the risks to which they are exposed in the case that they do not use the proper protection equipment.

Regarding the improper disposal of materials, a study conducted in fifty municipalities in southern Minas Gerais identified the occurrence of 460 accidents in the period from 2007 to 2011 and found that half of them occurred among nursing assistants and technicians and in the improper disposal of perforating materials in garbage bags, stands, beds and others, corresponding to 29.7% of accidents. The disruption of skin integrity during intravenous drug administration corresponded to 8% of the cases⁽¹⁷⁾.

Importantly, aspects related to the disposal of sharps, such as filling the collection boxes above the level recommended by the manufacturer and the practice of depositing materials contaminated with blood in boxes that have already been filled through maneuvers such as pushing the materials by hand, increase the risk of perforation. We add to these factors the habit of recapping needles, which still occurs and interferes negatively with the prevention of accidents.

As stated above, from the Heidegger's perspective, man himself is an entity that only exists in this world due to the relationships established with other entities.

From this perspective, the relationship of care with yourself and the world characterizes all the accomplishments of life. Based on this projection, men happen to be with each other

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in their daily lives and no longer lonely. Through the possibility of being with each other, the being-there individual feels the awakening of a sense of solicitude and of worrying with each other⁽¹¹⁾.

Solicitude means to be in each other's company demonstrating care and concern. Care is manifested through "worries", transforming men into an existence beyond what was imposed on them. This is the most authentic expression of human existence; it transcends its own existence. Therefore, caution is all the ontological structure of "being-in-the-world"; it includes all forms of being-there in the world available to all possibilities along with others. Care belongs to the essential form of being-in-the-world. Being-there in this world primarily means being concerned with others⁽¹¹⁾.

Thus, the importance of dialogue with the nursing staff and the being-with becomes evident in order to diagnose the causes of improper disposal of sharps along with the technological and scientific advances amid a reality permeated with information that was little explored by nursing professionals.

Research conducted in the Netherlands points to the existence of 13 to 15 thousand work accidents a year in the country and refers to the importance of prevention and proper management of accidents. For the authors, the prevention of occupational exposure occurs through lifelong learning, work organization and use of safer equipment. The development of actions aimed at decreasing anxiety and uncertainty among workers is pointed out by the authors as an important action⁽¹⁸⁾.

In this respect, the workers' role and their awareness related to the real need to use protective equipment and focused attention during the procedures are fundamental to reducing the number of workplace accidents. Therefore, the planning of care activities requi-

res, in addition to scientific expertise, the ability to identify the complexity of care and the risk situations⁽¹⁹⁾.

Another relevant issue is the need for a fresh look at the physical spaces of work, which are often overcrowded which in turn hinders the movement of workers in small spaces and causes the occurrence of accidents. It is noticed that the conditions are inappropriate, due to inadequate physical structures in relation to ergonomics and furniture. We emphasize the importance of developing adequate working conditions through discussions and conversations between workers and managers of health institutions aimed at improving workers' health and, consequently, nursing care free of errors⁽²⁰⁾.

CONCLUSION

This study sought to unveil the phenomenon of *the experience of the accident with biological fluids according to the nursing staff* in order to rethink strategies for the reorganization of the work process. From their speeches, it was possible to understand the suffering experiences, characterized by insecurity, anxiety, fear of contamination, fear of death and failures in the support networks. The comments also reveal that the current context of occupational accidents with biological fluids in Brazil is permeated by a practice that encourages the occurrence of such accidents, endangering the life of the being-there in their existence. Issues such as work-overload, lack of human and material resources, inadequate space, failures in the training of professionals and in the continuing education process are the daily life of nursing workers. In this sense, the study points to the reorganization of the work process envisioning the following aspects: the creation of groups of workers as a way to identify the difficulties in

implementing institutional political activities aimed at preventing accidents with the focus on the subject, starting from the idea of being authentic care based on solicitude and understanding; reformulation of the physical structure and furniture; and strengthening of continuing education in hospitals.

REFERENCES

1. Felli VEA, Tronchin DMR. A qualidade de vida no trabalho e a saúde do trabalhador de enfermagem. In: Kurcgant P, organizadora. Gerenciamento em enfermagem. Rio de Janeiro: Guanabara Koogan; 2011.p 85-103.
2. Ministério do Trabalho e Emprego (Brasil). Seção de Estatística. Anuário dos trabalhadores: 2013. Brasília: Ministério do Trabalho; 2015.
3. Marziale MHP, Valin MD. Notification of work accidents with exposure to biological material: cross study. Online Brazilian Journal of Nursing [serial on the Internet]. 2012; [Cited 2015 Feb 11]; 11(1). Available from: <http://www.objnursing.uff.br/index.php/nursing/article/view/j.10.5935/16764285.20120006>
4. Naderi HR, Sheybani F, Bojdi A, Mostafavi I, Khosravi N. Occupational exposure to blood and other body fluids among health care workers at a university hospital in Iran. Workplace Health Saf. 2012 Oct; 60(10):419-22.
5. Gusmão GS, Oliveira AC, Gama CS. Acidente de trabalho com material biológico: análise da ocorrência e do registro. Cogitare Enferm. 2013; 18(3):558-64.
6. Mbaisi EM, Ng'ang'a Z, Wanzala P, Omolo J. Prevalence and factors associated with percutaneous injuries and splash exposures among health-care workers in provincial hospital, Kenya. Pan African Medical Journal. 2013; 14:10.
7. Reis PGTA, Driessen AL, Costa ACBA, NasrA, Collaço IA, Tomasich FDS. Perfil epidemiológico de acidentes com material biológico entre estudantes de medicina em um pronto-socorro cirúrgico. Rev. Col. Bras. Cir. 2013; 40(4): 287-292
8. Alves AP, Ferreira MD, Prearo MF, Gir E, Canini SRMS. Subnotificação de acidentes ocupacionais com material biológico pela enfermagem no bloco cirúrgico. Rev. Eletr. Enf. [Internet]. 2013; [Cited 2015 Feb 11]; 15(2):375-81. Available from: <https://www.fen.ufg.br/revista/v15/n2/pdf/v15n2a09.pdf>.
9. Azadi A, Anoosheh M, Delpisheh A. Frequency and barriers of underreported needlestick injuries amongst Iranian nurses, a questionnaire survey. J Clin Nurs. 2011; 20(3-4):488-93.
10. Daldon MTB, Lancman S. Vigilância em Saúde do Trabalhador – rumos e incertezas. Rev. bras. Saúde ocup. 2013; 38 (127): 92-106.
11. Heiddeger M. Ser e Tempo. Trad. revisada de Marcia de Sá Cavalcante Schuback. 7ª. ed. Petrópolis: Vozes, 2012.
12. Araújo TM, Barros LM, Caetano JÁ, Araújo FN, Ferreira Júnior FC, Lima ACF. Acidente ocupacional e contaminação pelo HIV: sentimentos vivenciados pelos profissionais de enfermagem. R. pesq: cuid. fundam. Online. 2012; 4(4):2972-79
13. Garner P, Salehi AS. Occupational injury history and universal precautions awareness: a survey in Kabul hospital staff. BMC Infectious Diseases 2010, 10:19.
14. Lima EC, Appolinário RS. A educação profissionalizante em enfermagem no Brasil: Desafios e perspectivas. Rev. enferm. UERJ.2011; 19(2):311-6.
15. Claudio CV, Sarquis LMM, Scussiato LA, Miranda FMD. Monitoramento biológico sob a ótica dos enfermeiros gerentes. Rev Rene. 2013; 14(2): 252-61.
16. Marziale MHP, Santos HEC, Cenzi CM, Rocha FLR, Trovó MEM. Consequências da exposição ocupacional a material biológico entre trabalhadores de um hospital universitário. Esc. Anna Nery. 2014 18(1).
17. Julio RS, Filardi MB, Marziale MHP. Acidentes de trabalho com material biológico ocorridos em municípios de Minas Gerais. Rev.Bras.Enferm. 2014; 67(1): 119-26.
18. Van Wijk PTL, Schneeberger PM, Heimeriks K, Bolland GJ, Karagiannis I, Geraedts I et al. Occupational blood exposure accidents in the Netherlands. Eur J Public Health. 2010 20(3):281-7.

19. Gusmão GS, Oliveira AC, Gama CS. Acidente de trabalho com material biológico: análise da ocorrência e do registro. *Cogitare Enferm.* 2013; 18(3):558-64.
20. Gallas SR, Fontana RT. Biossegurança e a enfermagem nos cuidados clínicos: contribuições para a saúde do trabalhador. *Rev.Bras.Enf.* 2010; 63(5): 786-92.

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