

Safety of Nursing Staff and Determinants of Adherence to Personal Protective Equipment¹

Heliny Carneiro Cunha Neves²

Adenícia Custódia Silva e Souza³

Marcelo Medeiros⁴

Denize Bouttelet Munari⁵

Luana Cássia Miranda Ribeiro⁶

Anaclara Ferreira Veiga Tipple⁷

A qualitative study conducted in a teaching hospital with 15 nursing professionals. Attempted to analyze the reasons, attitudes and beliefs of nursing staff regarding adherence to personal protective equipment. Data were collected through focus groups, analyzed by the method of interpretation of meanings, considering Rosenstock's model of health beliefs as a reference framework. Data revealed two themes: Occupational safety and Interpersonal Relationship. We identified several barriers that interfere in matters of safety and personal protective equipment, such as communication, work overload, physical structure, accessibility of protective equipment and organizational and management aspects. Adherence to personal protective equipment is determined by the context experienced in the workplace, as well as by individual values and beliefs, but the decision to use the personal protective equipment is individual.

Descriptors: Protective Devices; Universal Precautions; Nursing; Occupational Health.

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² RN, M.Sc. in Nursing, Assistant Professor, Faculdade de Enfermagem, Universidade Federal de Goiás, Goiânia, GO, Brazil. Scholarship holder of da Coordenação de Aperfeiçoamento de Pessoal de Ensino Superior (CAPES). E-mail: nynne_cunha@yahoo.com.br.

³ RN, Ph.D. in Nursing, Associate Professor, Faculdade de Enfermagem, Universidade Federal de Goiás, Goiânia, GO, Brazil. E-mail: adenicia@fen.ufg.br.

⁴ RN, Ph.D. in Nursing, Associate Professor, Faculdade de Enfermagem, Universidade Federal de Goiás, Goiânia, GO, Brazil. E-mail: marcelo@fen.ufg.br.

⁵ RN, Ph.D. in Nursing, Full Professor, Faculdade de Enfermagem, Universidade Federal de Goiás, Goiânia, GO, Brazil. E-mail: denize@fen.ufg.br.

⁶ RN, Master's Student in Nursing, Faculdade de Enfermagem, Universidade Federal de Goiás, Goiânia, GO, Brazil. E-mail: luaufg@yahoo.com.br.

⁷ RN, Ph.D. in Nursing, Associate Professor, Faculdade de Enfermagem, Universidade Federal de Goiás, Goiânia, GO, Brazil. E-mail: anaclara@fen.ufg.br.

Corresponding Author:

Heliny Carneiro Cunha Neves

Rua Lucas Carvelo Filho, 11, Quadra 19, Lote 20, Setor Cristina II

CEP: 75380-000 Trindade, GO, Brasil

E-mail: nynne_cunha@yahoo.com.br

Segurança dos trabalhadores de enfermagem e fatores determinantes para adesão aos equipamentos de proteção individual

Trata-se de estudo qualitativo, realizado em um hospital universitário, com 15 profissionais de enfermagem. Objetivaram-se analisar as razões, atitudes e crenças dos trabalhadores de enfermagem, referentes à adesão aos equipamentos de proteção individual. Os dados foram coletados por meio do grupo focal, analisados pelo método de interpretação de sentidos, considerando o referencial do modelo de crenças em saúde de Rosenstock. Dos dados, emergiram duas categorias temáticas, segurança no trabalho e relacionamento interpessoal. Identificaram-se várias barreiras que interferem nas questões de segurança e proteção individual como comunicação, sobrecarga do trabalho, estrutura física, acessibilidade aos equipamentos de proteção e aspectos organizacionais e gerenciais. A adesão aos equipamentos de proteção é determinada tanto pelo contexto vivenciado, no ambiente de trabalho, como, também, por valores e crenças individuais, mas a decisão sobre o uso dos equipamentos de proteção é individual.

Descritores: Equipamentos de Proteção; Precauções Universais; Enfermagem; Saúde do Trabalhador.

La seguridad de los trabajadores de enfermería y los factores determinantes para adhesión a los equipamientos de protección individual

Estudio cualitativo realizado en un hospital universitario con 15 profesionales de enfermería. Objetivó analizar las razones, actitudes y creencias de los trabajadores de enfermería referentes a la adhesión a los equipamientos de protección individual. Los datos fueron recolectados por medio de grupo focal, analizados por el método de interpretación de sentidos, considerando el referencial del modelo de creencias sobre salud de Rosenstock. De los datos surgieron dos categorías temáticas, Seguridad en el trabajo y Relaciones Interpersonales. Identificamos varias barreras que interfieren en las cuestiones de seguridad y protección individual como comunicación, sobrecarga de trabajo, estructura física, accesibilidad a los equipamientos de protección y aspectos organizacionales y administrativos. La adhesión a los equipamientos de protección es determinada tanto por el contexto experimentado en el ambiente de trabajo, como por valores y creencias individuales; sin embargo, la decisión del uso de los equipamientos de protección es individual.

Descriptores: Equipos de Seguridad; Precauciones Universales; Enfermería; Salud Laboral.

Introduction

As an eminently social activity, work plays a fundamental role in man's living conditions. It entails positive effects when it is capable of attending to workers' basic needs for subsistence, creation and cooperation. On the other hand, when performing work, man is constantly exposed to the risks present in the work environment, which can interfere directly in their health conditions⁽¹⁾.

Among health professionals, nursing workers are

exposed to different risks, caused by chemical, physical, biological, psychosocial and ergonomic agents. These are more exposed to biological material due to their professional routine⁽²⁻³⁾. With regard to biological risk, those caused by the Aids virus (HIV), hepatitis B and C (HBV and HCV) are the most concerning infections⁽⁴⁾. The main occupational transmission route of these viruses is blood-borne, through percutaneous accidents. More than 60 pathogens can be transmitted through this

transmission route, including viruses, bacteria, parasites and fungi⁽⁵⁾.

Preventing pathogen transmission in the work environment demands diversified occupational risk reduction measures. Standard precautions (SP) are considered one of the main prevention measures to avoid exposure, and the appropriate use of personal protective equipment can considerably minimize these risks^(1,6).

Among SP, personal protective equipment is a fundamental tool for accident prevention, but professionals' resistance to their use and incorrect use are the main barriers to prevent biological material exposure⁽⁷⁾.

Low compliance with personal protective equipment use and its incorrect handling derive from factors like discomfort, inconvenience, carelessness, forgetfulness, lack of habit, equipment inadequacy, insufficient quantity and disbelief in its use⁽⁸⁻⁹⁾. These factors are aggravated by precarious infrastructure, organizational aspects of work, lack of knowledge due to inexistence of permanent education, work overload, physical fatigue and lack of time^(3,10).

Compliance with personal protective equipment use is closely related with the professionals' perception about the risks they are exposed to and their susceptibility to these risks⁽¹¹⁾. Nursing professionals who self-assess the risk of percutaneous accidents as low or medium in their work environment face a greater chance of experiencing an accident in comparison with those who assess the risk as high⁽¹²⁾.

Professionals' knowledge on risks in the work environment does not always guarantee compliance with the use of protective measures⁽¹¹⁾. In general, this knowledge does not turn into safe accident and occupational illness prevention actions^(1,4), which marks the need for more effective actions to change this reality.

In this sense, understanding the factors that influence decision making towards (no) protection is fundamental to reflect on the practice of these measures in the nursing team's daily work and direct strategies to enhance their incorporation in health care services.

Thus, this paper aims to analyze nursing workers' reasons, attitudes and beliefs regarding compliance with personal protective equipment.

Method

This exploratory study with a qualitative approach

attempted to understand the symbolic universe that permeates nursing professionals' compliance with personal protective equipment.

The research was developed at a large-sized general teaching hospital in the Central-West of Brazil. Study participants were nurses, nursing technicians and auxiliaries who were part of the hospital's permanent nursing staff, responded to the invitation and voluntarily agreed to participate by signing the informed consent term, after receiving clarifications about the research aims.

The researchers visited the different hospital departments to invite the professionals: medical clinic, surgical clinic, medical ICU, surgical ICU, adult and child emergency care, maternity, pediatric clinic, tropical clinic, Material and Sterilization Center and Surgical center, in different work shifts. During this first contact, 57 professionals were listed who were willing to participate. After defining the times, organized so as to attend to most people, professionals were contacted by phone. Thirty-five professionals confirmed their participation and, on the days set for the sessions, 15 professionals attended and served as the study subjects.

Data were collected between November and December 2008 through the focus group (FG) technique. To start discussions, the following guiding questions were used: what is personal protective equipment in your daily practice; what personal factors motivate and discourage you to use them and what factors facilitate and hamper the use of this equipment.

Three groups were held at different times to cover as many participants as possible. In each group, five professionals attended and the sessions took approximately two hours. Three researchers led the group, one as the coordinator and the others as participant observers, responsible for registering the group's production.

Only one meeting was held with each group, as the number of participants (five) contributed to an exhaustive discussion, permitting the achievement of the proposed objectives due to the in-depth treatment of the theme the group achieved in a single session.

The group sessions were recorded and immediately transcribed for the sake of proper registration and analysis through the interpretation of meanings method⁽¹³⁾. After exhaustive reading of the transcribed material, two thematic categories could be identified. The participants reports were identified as G1 (participant in group 1), G2 (participant in group 2) and G3 (participant in group 3).

After identifying the theme categories, they were

discussed according to the theoretical framework of Rosenstock's health beliefs⁽¹⁴⁾, which proposes an analysis in four dimensions: perceived susceptibility, perceived severity, perceived benefits and perceived barriers.

Approval for the research project this paper resulted from was obtained from the Ethics Committee for Human and Animal Research at the Federal University of Goiás Hospital das Clínicas, under research approval number 015/08.

Results and Discussion

Study participants were fifteen nursing professionals, ten technicians (three men and seven women) and five nurses, who have worked in the nursing area for approximately ten years. Their personal and professional life history contains experiences of vulnerability to risk and exposure to biological material the hospital environment entails when they perform their care-related activities.

The thematic categories the group members' statements evidenced were called "Safety at Work" and "Interpersonal Relationship". Both categories will be discussed separately, despite their interconnections.

Safety at work

This category includes themes related to the work environment, which are: organizational, management and physical structure aspects, which are factors that interfere in the professional's protection, influencing towards defenselessness. The reality of safety at work, management's role in the availability of and access to personal protective equipment and the work overload the groups evidence compromise adherence to safety equipment and entail greater susceptibility to occupational risks.

[...] the environment we work in contains a wide range of hampering factors, because we work with a very heavy work overload, with chronic patients... with a huge lack of material, the distance to pick up the material, the pharmacy that is delayed, that takes time... everything making it difficult (G2).

[...] the risk increases ... you are in no adequate conditions to offer the care the patient needs ... (G3).

[...] we disbelieve that it's going to get better, that it's going to work out, that we will have a better work environment. We disbelieve in all that (G2).

Management and organizational practices determine the work environment and, in this study, they appear as barriers that impede and hamper professionals'

compliance with the protective equipment. The perceived barriers can act as impediments for the adoption of recommended behaviors and can produce conflicts in decision-making⁽¹⁴⁾.

The groups evidence the health service's lack of commitment and respect for the protection of workers in the work environment, entailing disbelieving, dissatisfied and demotivated workers in view of the work conditions offered.

A study on the assessment of nursing work conditions' contribution to occupational accident risks involving piercing and cutting material identified that inadequate organizational structure and high workloads are associated with a 50% to 200% increase in the incidence of percutaneous injuries⁽¹⁵⁾.

The organizational and management structure should collaborate and stimulate decision-making to use personal protective equipment, so as to annul barriers inherent to its use and professionals' beliefs, through awareness raising to improve work conditions, as well as through workers' involvement in infection prevention and control program decision, elaboration and dissemination processes.

Accessibility and availability of personal protective equipment were also reported in the groups, which expressed that the availability of protective equipment in various strategic sites across the departments facilitate and enhance its use.

I think that having equipment nearby already represents a facilitator (G2).

We attempt to use them (protective equipment) as much as possible, also because it's easier to use at clinic Y than at clinic Z, the material is all over. So, "we don't use" if we don't want to (G3).

When the institution does not offer any counterpart in terms of availability and easy access to the safety equipment, however, professionals feel demotivated. Insecurity in the work environment predisposes to errors and the problems they entail.

[...] each time you need them you have to search... if the management controlled this equipment, I don't know if weekly, monthly or daily, that would facilitate things... making sure there is no lack, or find equipment that would fit us better (G2).

[...] going to the manager to immediately provide for the equipment, the hospital has to make it available to allow the worker to serve as a caregiver. How can he be a caregiver if he doesn't have the minimum equipment needed to work? (G1).

The groups discussed management's role in compliance with protective equipment use, mainly involving lack of control and supplies. A study shows

that, despite the availability of this equipment, its use was low⁽⁸⁾, as opposed to another study that indicated unavailability as the main reason for non-compliance⁽¹⁶⁾. These studies evidence the complexity of compliance with protective equipment, which goes beyond availability, confirming the interference of individual factors, beliefs and relations in the work environment in decision making towards (no) protection.

On the other hand, the lack of safety equipment and the inadequate physical structure make improvisation an ingrained part of both professional and service routine. This strategy is due to the research subjects' risk awareness and ethical and moral aspects. However, improvisation does not guarantee safety, neither for the other nor for oneself. It merely enhances the feeling of having done one's duty, even if to the detriment of one's protection.

It has already happened that mask N95 was not available, and I put on a common mask and a compress below (G1).

[...] the problem is that we improvise with what is available, we keep things going. If you stop doing things and report that it wasn't done things change. The thing is that we always want to solve the problem without having proper conditions... (G3).

[...] over there at clinic K it's very stuffy, there's no window there, generally the staff doesn't use a gown (G1).

The frequency of improvisation at the health care services turns it into a routine and crystallizes this culture at both management and care level. These aspects decrease the motivation, interest and willingness to face this situation, which above all represents a bioethical aspect of care.

Professionals are aware that refusing to perform the procedures due to the lack of personal protective equipment could be an instrument used to start a process of discussion and practice change. Nevertheless, the fear of losing one's job, the distancing between management and frontline care staff and the profession's ethical responsibility stimulate the submissive behavior of not complaining and continuing to perform care in an unsafe way. It should be highlighted that, in these cases, legislation NR32/2005⁽¹⁷⁾ protects workers by guaranteeing that the PPE should be sufficiently available at the workplace, so as to guarantee immediate supplies or replacement.

The physical structure with inadequate ventilation and illumination turn protective equipment use bothersome, contribution to low compliance due to increased heat. In addition, there is the fact that Brazil is a tropical country, where temperatures in environmental conditions are already high. Studies appoint heat and the

discomfort of mainly masks and gowns as intervenient factors for the use of this equipment⁽⁸⁻⁹⁾.

We identified the lack of routine to use and handle the safety equipment. Besides, the professionals do not participate in the elaboration of this routine which, when performed, involves nursing trainees.

The use of the personal protective equipment ends up not being the same for everyone. One of the reasons is the lack of systemization (G1).

[...] when there are nursing trainees, they put up posters on protective equipment at the isolation doors, with everything explained in detail, then we use it (G3).

The standardization and socialization of protective equipment use and handling are fundamental for professionals to have the necessary support to enhance safety in the work environment, orient health service-related infection control and prevention practices and adopt adequate behaviors towards risk. The analysis of the groups' statements reveals contents loaded with health beliefs⁽¹⁴⁾, such as risk susceptibility and severity, which contribute to the adoption of safe behaviors in the work environment.

Susceptibility and severity were expressed by feelings like fear of death and contamination, panic, concern with the family and doubt.

I work full of equipment. It's the gown, mask, gloves... we try and protect ourselves with what's available. It's the fear, fear (G2).

[...] we observe that the staff remembers the protective equipment when they're panicking (G3).

[...] I have a small baby and I'm very concerned. Fear of doing a procedure without equipment and getting contaminated out of carelessness...(G2).

We observe that these professionals' concerns are focused on occupational exposure, the risk of catching a disease, with entails consequences in the personal, psychological, social and family sphere. Workers' experiences in their work environment affect their social context and family life⁽¹⁸⁾. In that sense, concerns with catching some occupationally transmitted disease and a possible negative reaction for family members exert a pro-active influence towards protection and equipment use.

The groups evidence the benefits of personal protective equipment use by the feeling of wellbeing, tranquility and balance. They do acknowledge, however, that its use does not fully eliminate exposure risks.

[...] even when using protective equipment we are at risk of being exposed. Now, not using is worse (G3).

The perception of susceptibility and disease severity

can motivate people to adopt a certain conduct, but does not define the course of action to be taken. What guides action are personal beliefs related to the efficacy of known and available alternatives to decrease the threat of the disease or the perceived benefits of that action. Behavior depends on how beneficial the worker considers the various alternatives available in that specific case to be. One alternative is seen as a benefit when it relates to the person's decreased susceptibility or disease severity and can be determined by standards and social group pressure⁽¹⁴⁾.

On the other hand, the lack of fear of contamination and the belief that nothing will happen to him reinforces the feeling of self-confidence and enhances (non) protection.

Self-confidence is a factor hampering protective equipment use, mainly when you have to do a puncture. I say: put on the glove. And the colleague answers: there's no need, I'm a champ at doing this! (G1).

Self-confidence leads to neglect in personal protective equipment use and is reinforced by the experience that its use interferes with the professional's skills and makes it more difficult to perform the procedure. Thus, the professional chooses not to use the equipment, underestimating its protective function.

Data show that the work overload, physical structure, absence or inaccessibility of protective equipment, organizational aspects and self-confidence constituted barriers hampering decision-making to act regarding professional protection. The barriers weaken the perceived risk susceptibility and severity and decrease the relationship of forces towards compliance with positive behavior⁽¹⁴⁾.

Interpersonal relationship

The influence of relations and communication among professional categories and between them and management regarding compliance with personal protective equipment stood out in the groups' statements. The subjects expressed lack of motivation to use this equipment in work environments where interpersonal relations are not healthy.

There is stimulus towards use and stimulus towards non-use. As for non-compliance with protective equipment, they say: she got out of college yesterday and wants to give you a weird order! (G1).

Relations in the work environment are determinant and often decisive for decision-making towards (non) protection and interfere directly in safety in the work environment. In the relationship, each person shows

a bit of him/herself, his/her way of acting and exerts positive or negative influence on the other⁽¹⁹⁾. A study identified that colleagues at work can exert positive or negative influence on gloves use to perform peripheral puncture, in line with the present study findings⁽²⁰⁾.

In the same way as professionals influence and motivate other colleagues towards protection, the groups reported that some also drive towards risk behavior. Often due to lack of supervision, motivation, fear of losing a friend, or to be part of the group, they do not protect themselves, thus disseminating the action of carelessness with oneself and other professional colleagues.

[...] in practice, he sees everyone doing it wrong, so he thinks, well, they've never called attention, nothing different has ever happened to me, I don't want to be the ugly duck. So he gets attached to that staff who already does it wrong and get distorted (G1).

Although apparently simple, decision-making towards professional protection shows to be extremely complex and depending on an entire occupational context, in which an actual struggle for acceptance, respect and survival in the group takes place. In fact, the use of defense mechanisms for one's maintenance in the group ends up sublimating one's individual and ethical precepts.

Work activities that do not show to be interesting or are stressful and conflicting lead to demotivation and appear as determinant factors for non-compliance with protective equipment, exposing professionals even further to occupational risks and work accidents.

[...] all of the stress we experience in interconnections in the work environment, with the laboratory, X-ray, nutrition, pharmacy, enhances stress if communication does not flow calmly, it entails emotional lack of control to the extent that you get more exposed to accidents (G2).

The stress this group mentions is directly related with the non-establishment of an operational flow for services that support user care. This causes a work overload and exhaustion in work relations. A study also evidenced that the work environment significantly contributes to carelessness, given the great activity demand, requirements, work overload and tasks to be performed⁽²¹⁾.

In health care services, a multiprofessional team is responsible for user care, but does not actually work as a team. Instead, actions are performed in a non-coordinated way and mostly developed individually, entailing overload and stress.

[...] Sometimes there is material you'll never need,

inadequate for the workplace, while other material you need is missing ... who is ordering or purchasing is not fine-tuned with the service (G3).

We consider that health service management is highly responsible for maintaining a work environment that contributes to enhance individual and collective risk perception. It should also imprint respectful and ethical work dynamics, bringing down the barriers met in practice for the adoption of protective measures. This management support does not only provide moral and legal backup, but will also encourage professionals towards decision-making in favor of protection.

The road that makes people expose themselves to risks is determined by a set of conditions: communication, interpersonal relation, other people's and personal lack of risk awareness in the work environment, and mainly behavior. One cannot think of individual interventions only, without considering the context interfering in these behaviors, which should support and direct professionals in a perspective of greater self-protection.

Final considerations

The analysis of nursing workers' reasons, attitudes and beliefs regarding compliance with personal protective equipment reveals that the group know the risks they are exposed to in the work environment, but that this knowledge is not always sufficient to avoid the exposure, revealing medium risk susceptibility.

Their perception level of the severity is high, understanding that the non-use of personal protective equipment represents a possibility of catching an occupational illness, which can entail severe consequences in the social, family, psychological, relational spheres and in the work environment. It even means risk of death and disability.

Despite the countless referred barriers for compliance with protective equipment, professionals acknowledge its benefits, but are aware that its use does not exclude the risk of exposure to and acquisition of a blood or airborne infection.

The barriers appointed for low compliance with individual protective equipment use are associated with organizational, management and relational equipment, expressed as: inadequate physical structure; availability and access to protective equipment; lack of routines; work overload; stress; improvisation and exhaustion in work relations.

Despite the clarity of existing barriers for compliance, professionals do not exempt themselves from the personal responsibility for personal protective

equipment use. Compliance with this equipment is an individual and personal behavior, but strongly determined by health beliefs. The perception of susceptibility to and severity of exposure risks in these professionals' work environment, in addition to the perceived benefits of protective equipment, are positive forces that could contribute to decision-making on the use of protective equipment.

However, the countless barriers these workers perceive in the work environment with a view to the use of personal protective equipment annul the positive forces and negatively influence decision-making regarding this preventive measure.

Hence, the habit of accusing workers due to the non-use of protective equipment without understanding the context, determinant factors and health beliefs is to say the least an act of moral and ethical violence. The analysis of all intrinsic and extrinsic factors in the work environment and the recovery of professional valuation can increase adherence to personal protective equipment and, consequently, infection prevention and control.

References

1. Melo DS, Silva e Souza AC, Tipple AFV, Neves ZCP, Pereira MS. Nurses' understanding of standard precautions at a public hospital in Goiania - GO, Brazil. *Rev. Latino-Am. Enfermagem.* 2006;14(5):720-7.
2. Gir E, Caffer Netto J, Malaguti SE, Canini SRMS, Hayashida M, Machado AA. Accidents with biological material and immunization against Hepatitis B among students from the health area. *Rev. Latino-Am. Enfermagem.* 2008;16(3):401-6.
3. Leigh JP, Wiatrowski WJ, Gillen M, Steenland NK. Characteristics of persons and jobs with needlestick injuries in a national data set. *Am J Infect Control.* 2008;36(6):414-20.
4. Brevidei MM, Cianciarulo TI. Níveis de adesão às precauções-padrão entre os profissionais médicos e de enfermagem de um hospital universitário. *Online Braz J Nurs.* [Internet]. 2006 [acesso 15 out 2006];5(1). Disponível em: <http://www.uff.br/objnursing/viewarticle.php?id=407&layout=html>
5. Tarantola A, Abitebou LD, Rachiline A. Infection risks following accidental exposure to blood fluids in health care workers: a review of pathogens transmitted in published cases. *Am J Infect Control.* 2006;34(6):367-75.
6. Siegel JD, Rhinehart E, Jackson M, Chiarello L. Health Care Infection Control Practices Advisory Committee. Guideline for Isolation Precautions: Preventing

- Transmission of Infectious Agents in Health Care Settings. *Am J Infect Control*. 2007;35(10 Suppl 2):S65-S164.
7. Malaguti SE, Hayashida M, Canini SRMS, Gir E. Enfermeiros com cargos de chefia e medidas preventivas à exposição ocupacional: facilidades e barreiras. *Rev Esc Enferm USP*. 2008;42(3):496-503.
8. Tipple AVF, Aguliari HT, Souza ACS, Pereira MS, Mendonça ACC, Silveira C. Equipamentos de proteção em centros de material e esterilização, uso e fatores intervenientes à adesão. *Cienc Cuid Saúde*. 2007;6(4):441-8.
9. Souza ACS, Neves HCC, Tipple AFV, Santos SLV, Silva CF, Barreto RAS. Conhecimento dos graduandos de enfermagem sobre equipamentos de proteção individual: a contribuição das instituições formadoras. *Rev Eletr Enferm*. [internet]. 2008 [acesso 11 mar 2009];10(2):428-37. Available from: <http://www.fen.ufg.br/revista/v10/n2/pdf/v10n2a14.pdf>
10. Castro MR, Farias SNP. A produção científica sobre riscos ocupacionais a que estão expostos os trabalhadores de enfermagem. *Esc Anna Nery*. 2008;12(2):364-9.
11. Souza MCMR, Freitas MIF. Representações de profissionais da atenção primária sobre risco ocupacional de infecção pelo HIV. *Rev. Latino-Am. Enfermagem*. [Internet]. 2010 [acesso em: 10 nov. 2010];18(4):[08 telas]. Disponível: http://www.scielo.br/pdf/rlae/v18n4/pt_13.pdf
12. Canini SRMS, Moraes SA, Gir E, Freitas ICM. Percutaneous injuries correlates in the nursing team of a brazilian tertiary-care university hospital. *Rev. Latino-Am. Enfermagem*. 2008;16(5):818-23.
13. Minayo MCS. O desafio do conhecimento: pesquisa qualitativa em saúde. São Paulo: Hucitec; 2006.
14. Rosenstock IM. The health belief model and preventive health behavior. *Health Educ Monogr*. 1974;2(4):354-86.
15. Stone PW, Clarke SP, Cimiotti J, Correa de Araújo, R. Nurses' working conditions: implications for infectious diseases. *Emerg Infect Dis*. 2004;10(11):1984-9.
16. Ganczak M, Szych Z. Surgical nurses and compliance with personal protective equipment. *J Hosp Infect*. 2007;66(4):347-52.
17. Brasil. Ministério do Trabalho e Emprego. Portaria nº485, de 11 de novembro de 2005. Aprova a Norma Regulamentadora nº 32. Segurança e Saúde no Trabalho em Estabelecimentos de Saúde. Brasília (BR): Ministério do Trabalho e Emprego; 2005.
18. Castanha AR, Machado AA, Figueiredo MAC. Consequências biopsicossociais do acidente ocupacional com material biológico potencialmente contaminado: perspectiva de pessoas do convívio íntimo do profissional da saúde. *Rev SBPH*. 2007;10(1):65-84.
19. Cunha PJ, Zagonel IPS. As relações interpessoais nas ações de cuidar em ambiente tecnológico hospitalar. *Acta Paul Enferm*. 2008;21(3):412-9.
20. Zapparoli AS, Marziale MHP, Robazzi, MLCC. Práctica segura del uso de guantes en la puncion venosa por los trabajadores de enfermeria. *Cienc Enferm*. 2006;12(2):63-7.
21. Baggio MA, Formaggio FM. Trabalho, cotidiano e o profissional de enfermagem: o significado do descuidado de si. *Cogitare Enferm*. 2008;13(1):67-74.

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