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Original article

USE OF PERSONAL PROTECTIVE EQUIPMENT IN A HOME CARE SERVICE

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ABSTRACT: A cross-sectional study was conducted at a home care service in the state of São Paulo. The objective of the study was to identify the use of personal protective equipment, safety devices, the disposal of sharp objects, and other factors that make difficult and/or facilitate such use by professionals of the nursing team. The population was made up of 45 participants who reported using personal protective equipment. They all reported using gloves, frequent procedures that required their use were dressings and administration of medications. Although it was reported that the participants did not have difficulty in using personal protective equipment, and that they were concerned about their own safety, full adherence was lacking. Therefore, further studies that are able to evaluate how home care services really occur are necessary, so that prevention strategies can be identified and incorporated into professionals' practice.
DESCRIPTORS: Nursing team; Personal Protective Equipment; Exposure to Biological Agents; Home Care Services.

USO DE EQUIPAMENTO DE PROTEÇÃO INDIVIDUAL EM UM SERVIÇO DE ATENÇÃO DOMICILIAR

RESUMO: Trata-se de um estudo transversal conduzido num Serviço de Atenção Domiciliar do interior paulista. Teve como objetivos identificar o uso de Equipamento de Proteção Individual, dispositivos de segurança, descarte de materiais perfurocortantes e fatores que dificultam e/ou facilitam o seu uso por profissionais da equipe de enfermagem. A população foi composta por 45 participantes e todos relataram usar Equipamento de Proteção Individual, sendo que 100% referiram usar luvas e os procedimentos frequentes para o uso foram curativos e administração de medicamentos. Apesar de relatarem que não há dificuldade para utilizar os Equipamentos de Proteção Individual e que se preocupam com sua própria segurança, observou-se que a adesão não foi integral. Assim, são necessários estudos futuros capazes de avaliar como ocorre de fato a assistência à saúde dos usuários nos domicílios, para que estratégias de prevenção possam ser identificadas e incorporadas à prática desses profissionais.
DESCRITORES: Equipe de enfermagem; Equipamento de proteção individual; Exposição à agentes biológicos; Serviços de assistência domiciliar.

USO DE EQUIPOS DE PROTECCIÓN PERSONAL EN SERVICIO DE ATENCIÓN DOMICILIARIA

RESUMEN: Estudio transversal realizado en un Servicio de Atención Domiciliaria del interior paulista, con el objetivo de identificar el uso de Equipos de Protección Personal, mecanismos de seguridad, descarte de materiales punzocortantes y factores que dificultan y/o facilitan su utilización en profesionales del equipo de enfermería. La población se compuso de 45 participantes, todos informaron usar Equipos de Protección Personal, el 100% afirmó usar guantes y los procedimientos para su uso frecuente fueron vendajes y administración de medicamentos. A pesar de informarse que no existe dificultado para utilizar Equipos de Protección Personal y que se preocupan por la propia seguridad, se observó que la adhesión no fue integral. Consecuentemente, existe necesidad de estudios a futuro, capaces de evaluar cómo transcurre de hecho la atención de la salud de usuarios en sus domicilios, para poder identificar e incorporar estrategias preventivas a la práctica de estos profesionales.
DESCRIPTORES: Grupo de Enfermería; Equipo de Protección Personal; Exposición a Agentes Biológicos; Servicios de Atención de Salud a Domicilio.

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INTRODUCTION

Healthcare professionals are often exposed to occupational accidents involving biological materials through injuries with sharps objects, such as needles contaminated with blood, splashes of secretion from mucous membranes, or through contact with non-intact skin[1]. Epidemiological data from the United States referring to seroconversion in healthcare professionals from 1985 to 2013, showed evidence that nursing professionals reported the highest rate of human immunodeficiency virus (HIV) through seroconversion[2].

Estimated risk transmission of HIV after accidents with sharp objects and from patients with positive serology is from 0.3% to 0.5%, and, after exposure to mucous membrane, it is 0.09%. Transmission regarding skin exposure has already been documented; however, its risk has not yet been quantified. In addition to the HIV, other viruses such as hepatitis B and C may also be transmitted after occupational exposure to biological material[3].

In Brazil, the Regulatory Standard NR-32 of the Brazilian Ministry of Labor of November 16, 2009 establishes basic standards for the implementation of health protection measures for professionals of healthcare services, as well as for those who work with health promotion and care in general. The aim of this standard is to reduce the number of work accidents from biological material, counseling that employers inform their employees regarding the risks to which they are exposed. Employers must also ensure that all healthcare workers have a right to a free immunization program against communicable diseases, continuous training, and availability of personal protective equipment (PPE)[4].

Most studies on occupational accidents with potentially contaminated biological material have been conducted in hospitals[5]. However, in recent years, there has been an increase in studies involving pre-hospital care teams, such as home care services. Nonetheless, these studies are still scarce, especially in Brazil[6].

According to the edict no. 2,029 of the Brazilian Ministry of Health of August 24, 2011, home care services (HCS) are considered a substitute or complementary service for hospitalizations or outpatient care, responsible for the management and implementation of home care multidisciplinary teams (EMAD, as per its acronym in Portuguese) and for supporting multidisciplinary teams (EMAP, as per its acronym in Portuguese)[7].

Because of being a relatively new health policy and field of work for nursing professionals, little is known about working conditions in HCSs and how their clinical practices and use of PPE occur. Therefore, the present study was considered relevant in identifying the use of PPE (gloves, goggles, gowns, and masks), safety devices (retractable needles, safe lancets), and the disposal of sharp objects as reported by professionals of the nursing team during home visits. The study also examined factors that facilitate and/or make the use of PPE difficult.

METHOD

A cross-sectional study was conducted with professionals who worked at the HCS of the Municipal Health Secretariat of Ribeirão Preto (SMS-RP, as per its acronym in Portuguese) during the relevant period. The population eligible for the study consisted of 50 nursing professionals, however, because five professionals refused to participate in the study, this number was reduced to45 participants. The inclusion criteria were that the participants must be currently working as nursing professionals and be able to undertake nursing procedures in homes. The exclusion criterion was applied to those professionals who undertook sporadic home visits.

Data collection occurred from November 2014 to October 2015, a period when all the eligible professionals were approached and invited to participate in the study. It is worth mentioning that because of the professionals' type of work, the researcher had to return to the unit more than once to approach them.

A structured interview guide previously submitted to the assessment of seven specialists in the theme was used (pre-test), who were requested to evaluate the clarity and relevance of the questions

and whether they were considered appropriate for the achievement of the objectives proposed. After data collection, double data entering was carried out in an Excel worksheet, and after correction of typing errors, the worksheet was transported to the Statistical Package for the Social Sciences (SPSS) 17.0 software, where definitive data was formatted, and management operations of variables were carried out. Data analysis was performed by means of descriptive statistics.

The study obtained authorization from the HCS and the SMS, and was approved by the research ethics committee of the Ribeirão Preto College of Nursing under protocol no. 076/2014. The interviews were scheduled and carried out in the relevant workplaces after the end of working hours, during the afternoon period, in a private room, and with the management's consent.

RESULTS

Table 1 shows the distribution of participants according to variables in the study. Of the 45 participants interviewed, 36 (80%) were women, 23 (51.1%) had a high school education, 23 (51.1%) were nursing aides, and 17 (37.8%) were nurses. It is worth noting that 36 (80%) participants had only one job.

Table 2 shows that the mean age of the participants was 47.8 years, minimum working time at the HCS was three months, mean period of experience in nursing was 23.3 years, maximum working hours at the HCS was 40 weekly hours, and maximum of total working hours was 70 weekly hours.

Nursing professionals who worked at the HCS were questioned regarding which procedures they used involving PPE during their professional practice at homes. They were allowed to report more than one procedure. The use of PPE was more often reported during the application of dressings. 36 (80%). In procedures considered high risk, such as venipunctures and airway suctioning, lower adherence in the use of PPE was found (Table 3).

All professionals who were interviewed reported using PPE; however, 45 (100%) of them mentioned the use of gloves, the lesser used PPE according to the professionals' report was the safety goggles 15 (33.3%) (Table 4).

Table 5 shows the distribution of variables according to conditions and reports of practice in home care services. N=33 (73.3%) professionals reported that the service provides safety devices and that they make use of these devices, n=40 (88.9%) mentioned bringing sharps disposal containers to homes. Regarding factors that facilitate the use of PPE, n=19 (42.2%) professionals reported that the concern for their safety was a facilitator, and n=25 (55.6%) reported not having any difficulty in its use.

Table 1 - Characterization of nursing professionals (n=45) of a home care service, according to variables in the study. Ribeirão Preto, São Paulo, Brazil, 2015

Variables	N	%
Gender		
Female	36	80
Male	9	20
Education level		
High school	23	51.1
Undergraduate school	19	42.3
Specialization	2	4.4
Master degree	1	2.2
Position		
Nurse	17	37.8
Nursing technician	5	11.1
Nursing aide	23	51.1
Number of jobs		
1	36	80
>1	9	20

Table 2 - Characterization of nursing professionals (n=45) of a home care service, according to variables in the study. Ribeirão Preto, São Paulo, Brazil, 2015

Variables	Mean	Minimum	Maximum	*SD
Age (years)	47.8	22	65	11.1
Period of experience at the HCS (months)	73.4	3	276	64.9
Time of experience in nursing (years)	23.3	1	40	9.9
Weekly working hours at the HCS (hours)	34.1	30	40	4.9
Total weekly working hours at the HCS (hours)	36.1	20	70	9.8

*Standard deviation

Table 3 - Distribution of nursing professionals (n=45) of a home care service, according to procedures in which nursing professionals use personal protective equipment. Ribeirão Preto, São Paulo, Brazil, 2015

Variables	N	%
Dressings		
Yes	36	80
No	9	20
Blood collection		
Yes	26	57.8
No	19	42.2
Administration of medications		
Yes	21	46.7
No	24	53.3
Tracheostomy change		
Yes	20	44.4
No	25	55.6
Venipunctures		
Yes	19	42.2
No	26	57.8
Airway suctioning		
Yes	16	35.6
No	29	64.4
Physical examination		
Yes	13	28.9
No	32	71.1

Table 4 - Distribution of nursing professionals (n=45) of a home care service, according to the type of personal protective equipment. Ribeirão Preto, São Paulo, Brazil, 2015

Variables	n	%
Use of PPE in professional practice		
Yes	45	100
Gloves		
Yes	45	100
Mask		
Yes	32	71.1
No	13	28.9
Gown		
Yes	24	53.3
No	21	46.7
Goggles		
Yes	15	33.3
No	30	66.7

Table 5 - Distribution of nursing professionals (n=45) of a home care service, according to conditions and reports of home care practices. Ribeirão Preto, São Paulo, Brazil, 2015

Variables	n	%
The service provides safety devices		
Yes	33	73.3
No	1	2.2
Sometimes	11	24.5
Making use of safety devices		
Yes	33	73.3
No	1	2.2
When available	11	24.5
Place for disposal of sharps		
Disposal in small containers	40	88.9
Collection in improvised containers and disposal at the Unit	5	11.1
Factors that facilitate the use of PPE		
Having PPE available	13	28.9
Not knowing the patient	5	11.1
Concern about their safety	19	42.2
Awareness of prevention	8	17.8
Factors that make the use of PPE difficult		
The service does not provide PPE	9	20
Heat	3	6.7
Having to bring them to homes	3	6.7
It affects palpation of veins during punctures	5	11
None	25	55.6

DISCUSSION

Among the 45 professionals who were interviewed and worked for the HCS nursing team, most were women. Similar results can be found in other studies[8]. According to data from Brazil's Federal Council of Nursing (COFEN, as per its acronym in Portuguese), 84.6% of the nursing team contingent in Brazil consists of women[9]. However, a significant increase in men can currently be observed in the nursing profession.

It was found that most professionals had a high school education and were nursing aides. This data is supported by other researchers(10). It is worth mentioning that 20% of the professionals interviewed reported having more than one job. Nursing practice requires interaction with suffering, continuous shifts, poor working conditions, great responsibility and little appreciation, resulting in dissatisfaction, sickness, and an increase in withdrawal of these professionals from their jobs[11].

Having two jobs, which is necessary for survival because of the reduction in the population's purchasing power, wears out the professionals' physical and psychic conditions. The need to work at an extra job makes it so that most of the nursing team's productive years are spent in the care environment, increasing their exposure time to occupational risks. A study conducted in a hospital in Germany found that the main reasons that led to accidents among healthcare professionals involving biological material were stressful work conditions, lack of PPE, and fatigue resulting from working routines[12].

Data presented by the COFEN show the unemployment scenario for this category, and 8.8% of the professionals interviewed reported being unemployed in the previous 12 months[9].

Recent studies conducted in hospitals showed that the mean age of the professionals' was 36.4 years[8,13]. However, the mean age of the participants in the present study was 47.8 years, thus characterizing a more experienced group.

Professional experience combined with the proper use of PPE may reduce exposure to biological risks. On the other hand, a study showed that professional unpreparedness evidenced by the lack of knowledge about the proper use of standard precautions and also the lack of manual and psychomotor skills to undertake several nursing procedures, facilitated the occurrence of accidents with sharp objects[10]. However, many times confidence in their knowledge about how to undertake procedures generates a false sense of safety, leading to the professionals not using the proper equipment.

In the present study, although the professionals reported high levels of experience in nursing, approximately 23 years, experience in home care services was only six years. Although with longer experience time in the profession, there was shorter experience time in home care services. Therefore, more knowledge of home health care and the use of PPE is necessary, because they represent a different reality from hospitals.

Although recommendation on using PPE is based on the type of procedure, without consideration of where the care is provided, it is worth mentioning that in some situations an improper environment for a particular procedure might make its use difficult. Homes have very different characteristics from health institutions, showing the need for conducting further studies to explore the working conditions of these healthcare professionals.

One of the aspects that distinguishes home care teams from other healthcare teams is the closer relationship they develop with home care users. Therefore, the innovative potentiality of home care is achieved by a greater involvement of the teams with different aspects of care experienced by users and their families. There may be an increase in care, which may be not restricted to just biological aspects of the disease, since professionals get closer to patients[14]. Many times, this closeness may give professionals some sense of safety, because by virtue of their proximity, they can judge if the patient carries any microorganism or communicable disease.

Regarding procedures undertaken at homes, 80% of the professionals reported using PPE during the application of dressings. The application of dressings might present a risk of exposure to blood and other fluids through splashes of the fluids in the eyes and mouth. In addition, specifically in pressure ulcer dressings, the use of a scalpel for the removal of devitalized tissue is frequent, associating the

procedure with a risk for accidents with sharp objects, both in their handling and disposal[15].

Nonetheless, it is worth mentioning that in procedures considered high risk, such as intravenous administration of medications and venipunctures, less than half of the professionals used PPE, that is, 46.7% and 42.2% respectively.

In the present study, all professionals interviewed reported using procedure gloves; however, only 33% reported the use of safety goggles. A study on adherence of nursing professionals to the use of PPE showed similar results, with procedure gloves being the most used PPE, and lower adherence to protection of the mucous membranes of the face, especially in the use of safety goggles[16].

Researchers carried out a study in two primary health care units in the city of Goiânia and found that health professionals did not use all PEE recommended for procedures by national regulatory agencies, compromising not only their own safety but the users' safety[16].

Regardless of the number of PPE available, the present study showed that nursing professionals neglected their use. In a qualitative study that aimed at investigating conceptions and practices of nursing technicians regarding biosafety, it was found that despite being available, a significant number admitted not using PPE when necessary. According to most participants interviewed, self-confidence, carelessness, and hurry were factors that contributed to the omission/negligence of the team in the use of PPE[17].

Most professionals in the present study reported that the service provides safety devices and that they use them in their practice. In addition, the professionals alleged not having difficulties in the use of PPE. Although the majority had mentioned that these were not factors that made the use of PPE difficult, some complained about the lack of material. Studies show that availability of PPE in the work environment might influence workers' adherence to their use[16]. According to the NR-32, the PPE must be available for workers in their workstations in sufficient numbers[4].

The professionals interviewed mentioned heat as a factor that made adherence to the use of PPE difficult. The physical structure with inappropriate ventilation and light makes its use uncomfortable, thus contributing to its low adherence. It addition to this, there is the fact of working in a tropical country, with high environmental temperatures. Data of one study showed heat and discomfort as factors that make the use of masks and gowns difficult[18].

A factor that might provide greater safety to professionals who work at homes is the use of safety devices (lancets, retractable needles, among others) as recommended by the NR-32[4]. A study conducted with nurses who worked at home care services showed that they did not use such devices due to the difficulty in accessing them, and also because they were not provided by their agencies[19]. However, providing PPE and safety devices does not ensure that professionals will adhere to their use or that they will use them as recommended.

In addition to the availability of PPE and workers' adherence to its use, the equipment must be properly used. A study[20] that evaluated the use of PPE by healthcare professionals by means of filming, found 1,797 cases of inappropriate behaviors, which were corrected. The error rate remained low in the two first weeks after the intervention and declined after this period, leading authors to conclude that the supervision of professionals and feedback on the proper use of PPE are important interventions that may contribute to the adoption of standardized safety behaviors by professionals.

CONCLUSION

In conclusion, all professionals reported the use of PPE; however, only procedure gloves were used by 100% of the professionals interviewed. Application of dressings with the use of PPE stood out. Most professionals reported that, in addition to PPE, the HCS offers safety devices, and the factor that most facilitates their use was concern about their own safety.

Although the majority reported that there are no difficult factors for the use of PPE, some complained about heat, transporting of materials to homes, and the fact that the employer did not provide them. Therefore, further studies assessing professional practice in homes may contribute to

the understanding of the use of PPE, in a different context from health institutions.

The implementation of strategies to promote an increase in professionals' safety depends on the knowledge of situations that represent risk and to aspects related to the individuals themselves and their institutions. Further studies must be conducted in the home care scenario, to know how its clinical practice really occurs, and which strategies for the promotion of occupational safety can be proposed and implemented.

During the interviews, some professionals might have only reported the use of PPE in the most relevant situations of their professional practice, and memory bias might have occurred, since they were asked about the use of PPE during their entire practice in the HCS. Nonetheless, despite these limitations, the study enabled the identification of situations in the use of PPE that might direct further studies in this field.

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