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Factors associated with the use of individual protection equipment by healthcare professionals

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Fatores associados ao uso de equipamento de proteção individual por profissionais de saúde

Factores asociados al uso de equipos de protección individual por profesionales sanitarios

RESUMO

Objetivo: Analisar os fatores associados ao uso de equipamento de proteção individual por profissionais de saúde vítimas de acidentes de trabalho no Brasil. Método: Estudo transversal e analítico sobre os fatores associados ao uso de equipamento de proteção individual. Resultados: Em apenas 27,38% dos acidentes de trabalho os profissionais utilizavam três ou mais equipamentos de proteção individual no momento do acidente. Ser profissional com idade ≤ 40 anos, ter ≤ 12 anos de escolaridade, trabalhar na capital ou região metropolitana, trabalhar com ocupação de nível técnico, ter ≤ 10 anos de trabalho, acidentar-se com exposição percutânea, por sangue e por perfuro cortantes, apresenta maiores chances de não estar usando equipamento de proteção individual nos casos de acidentes de trabalho. Conclusão: Os resultados podem contribuir para os planos de gestão de prevenção de acidentes de trabalho com material biológico e adesão das precauções-padrão, além da conscientização da importância das notificações dos acidentes.
DESCRITORES: Equipamento de Proteção Individual; Pessoal de Saúde; Acidentes de trabalho; Estudos Epidemiológicos; Saúde do Trabalhador.

ABSTRACT

Objective: to analyze the factors associated with the use of personal protective equipment by health professionals who are victims of work accidents in Brazil. Methods: cross-sectional and analytical study on factors associated with the use of personal protective equipment. Results: in only 27.38% of work accidents, professionals used three or more personal protective equipment at the time of the accident. Being a professional aged ≤ 40 years, having ≤ 12 years of schooling, working in the capital or metropolitan region, working with a technical occupation, having ≤ 10 years of work, having an accident with percutaneous exposure, by blood and by sharps, present greater chances of not using personal protective equipment in cases of work accidents. Conclusion: the results can contribute to management plans for the prevention of accidents at work with biological material and adherence to standard precautions, in addition to raising awareness of the importance of accident notifications.
DESCRIPTORS: Personal Protective Equipment;Health Personnel; Accidents, Occupational; Epidemiologic Studies;Occupational Health.

RESUMEN

Objetivo: analizar los factores asociados al uso de equipos de protección personal por profesionales de la salud víctimas de accidentes de trabajo en Brasil.Métodos: estudio transversal y analítico sobre factores asociados al uso de equipos de protección personal..Resultados: Sólo en el 27,38% de los accidentes de trabajo, los profesionales utilizaban tres o más equipos de protección personal en el momento del accidente. Ser profesional con edad ≤ 40 años, tener ≤ 12 años de escolaridad, trabajar en la capital o región metropolitana, trabajar con ocupación técnica, tener ≤ 10 años de trabajo, tener un accidente con exposición percutánea, por sangre y por cortopunzantes, presente mayores posibilidades de no utilizar el equipo de protección personal en casos de accidentes de trabajo.Conclusión: Los resultados pueden contribuir a los planes de gestión para la prevención de accidentes de trabajo con material biológico y la adherencia a las precauciones estándar, además de concienciar sobre la importancia de las notificaciones de accidentes.
DESCRIPTORES: Equipo de Protección Personal;Personal de Salud; Accidentes de Trabajo;Estudios Epidemiológicos; Salud Laboral.

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INTRODUCTION

Work is a social activity and plays an essential role in man's living conditions, however, it can generate several risks to professionals in their environment, interfering with their health condition and causing multiple injuries. [1]

In health services, workers are mainly exposed to risks related to biological materials (WAEBM), through direct contact with blood and biological fluids, either by percutaneous inoculation (sharp objects) or by direct contact with non-intact skin and/or mucous membranes. [2,3] This exposure to potentially contaminated blood, droplets and biological fluids can transmit infectious pathogens such as human immunodeficiency virus (HIV), hepatitis B and C, Covid-19 (SARS-CoV-2), among others. [4,5]

Biosafety in health work should start with the adoption of standard precautions (SPs) - hand hygiene, use of personal protective equipment (PPE) and collective protection equipment (CPE), proper management of waste from health services and immunization - in order to protect patients and healthcare professionals against exposure to fluids. [6,7]

According to Verbeek et al.[9], healthcare workers have a higher risk of infection than the general population, and the use of PPE can reduce the risk of contamination. Chugtai et al.[10] states that PPE is the most important precautionary measure, particularly during the early stage of an outbreak or pandemic, when drugs, vaccines, and other control measures are unavailable or access is limited.

The World Health Organization (WHO) highlights that the use of a mask is essential to stop the spread of certain respiratory diseases, both by health professionals and the general population, and can be used by healthy, asymptomatic, oligosymptomatic and sick people in order to prevent subsequent transmission. [11]

In Brazil, biosafety in healthcare work is ensured by Regulatory Standard No. 32 (NR 32), which recommends the adoption of preventive measures for each risk situation in order to promote workers' safety. [8] However, several studies indicate low adherence to the use of PPE among health professionals [12-15], related to discomfort, forgetfulness, inadequacy of equipment, insufficient quantity, disbelief in protection regarding its use, work overload and physical fatigue. In addition,

there are many doubts about adherence to the use of PPE and consistent and national epidemiological data is still scarce, which encourages research on the situation of adherence to the use of PPE by health professionals in Brazil.

In this sense, the theoretical model of hierarchical analysis in health has been used mainly in epidemiological studies with the aim of providing information on some health problems. [16] In this way, the study presents fundamental information about the circumstances that determine and influence the use of PPE in cases of accidents with exposure to biological material for the planning and evaluation of health services.

METHODS

An epidemiological, cross-sectional, analytical-type study of a historical series was carried out on the use of personal protective equipment by health professionals injured with exposure to biological material in Brazil, reported in the Ministry of Health's Information System on Notification of Diseases (Sinan/MS), from January 1st, 2010 to December 31st, 2018.

The study covered Brazil, its Federative

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Units (UF) and the Federal District. Divided into five regions (North, Northeast, Midwest, Southeast and South), 26 States and a Federal District, the country is the largest in South America (8,515,767 km²) and has a population of 190,732,694 inhabitants. [17] According to data from the National Register of Health Establishments (CNES - Cadastro Nacional dos Estabelecimentos de Saúde), it has a total of 2,821,467 health professionals registered in its territory.

The study population consisted of all health professionals who were victims of accidents at work with exposure to biological material in Brazil, reported on Sinan in the historical series studied, aged between 18 and 69 years old, excluding inconsistencies, incompleteness and duplicates.

An accident at work with exposure to biological material is understood to be any accident involving blood and other organic fluids that occur with health professionals during the development of their work, where they are exposed to potentially contaminated biological materials. [18]

Information was collected from the Sinan/MS database and exported to the Microsoft Excel 2018 program. Variables related to the sociodemographic and occupational profile of the injured health professionals and the characteristics of accidents with biological material were selected.

Effective adherence to the use of personal protective equipment (when health professionals used three or more PPE: gloves, apron, mask, goggles, face protection and boots) during the occurrence of an accident with biological material was considered as a dependent variable [19], categorized into 'yes' and 'no'. PPE was considered to be any device or product, for individual use used by the worker, intended to protect against risks likely to threaten safety and health at work, according to NR6. [20]

The independent variables were grouped into three blocks: the first block (distal) consisting of variables related to sociodemographic characteristics: age group in years (≤ 40 / > 40), gender (female/male) and education in years of study (≤ 12 /

>12). The second block (intermediate), formed by variables related to occupational characteristics: occupation (higher level: nurse, doctor, dentist, pharmacist, physiotherapist, nutritionist, psychologist and technical level: nursing technician, laboratory technicians - clinical analysis, pharmacy and pathology), work situation (formal - formal employee, civil servant and statutory employee; non-formal – cooperative, unregistered, temporary work, others), length of service in years (≤ 10, 11-20, > 20) and location of the accident (capital/metropolitan region and other municipalities). The third block (proximal) constituted by the variables related to accidents: type of accident (percutaneous, mucosa, percutaneous+mucosa), organic material involved (blood, fluid with blood, serum/plasma, and other fluids: cerebrospinal fluid, pleural fluid, amniotic fluid, ascitic fluid), and causative agent (sharps: needle, intracath, blade/lancet, glass and other agents: surgical instruments, equipment, gauze, compress, equipment).

Initially, a descriptive analysis of the data was carried out, through calculations of absolute and relative frequencies. Subsequently, an unadjusted analysis was performed, where the association of all variables in relation to the outcome was tested. Those with a p-value <0.20 were retained for the second phase.

For the second phase, a hierarchical type of analysis was used, which proposes the classification of variables according to their influence on the outcome, classifying them as distal, intermediate and proximal. Association estimates were adjusted for variables at the same hierarchical level and at previous levels, allowing for the permanence of those more intensely associated with the outcome of interest.

In this phase, Poisson regression analyzes with robust variance were used, with hierarchical data modeling in order to estimate prevalence ratios (PR) between the independent variables and the outcome (use or not of PPE).

The variables of the distal level that, in the unadjusted analysis, presented a p-value < 0.20; only the variables that

maintained p-value ≤ 0.05 remained at this level. Having maintained the variables at the distal level, the next step was to study the variables at the intermediate level. Finally, the variables of the proximal level were inserted in a similar way to those of the previous levels and the variables that maintained p-value ≤ 0.05 remained in the final model, values of prevalence ratios (PR) were estimated, using PR = 1 as a reference category, 95% confidence intervals were constructed and p-values were determined. Analyzes were performed using Stata 14.0.

This study is an integral part of the research entitled "Accidents at work with exposure to biological material among health professionals: space-time distribution and associated factors" financed with own resources. The research was carried out with secondary data in the public domain, in compliance with the ethical aspects of Resolutions 466/12 and 510/2016 of the National Health Council (CNS), approved by CEP-HUUFMA, under opinion nº 1.982.147/2017.

RESULTS

In the period from January 1st, 2010 to December 31, 2018, 308,997 occupational accidents with exposure to biological material were reported among health professionals, 27.38% were using three or more PPE at the time of the accident and 72.62% did not.

As for the sociodemographic profile of the studied population, there was a predominance of the age group ≤ 40 years old (74.55%), females (79.50%) and schooling ≤ 12 years of study (51.64%). Accidents were more frequent among health professionals who held a technical position (71.92%), who had a formal work situation (71.92%), with service time ≤ 10 years of work (63.68%) and who worked in the capital or metropolitan region (50.61%) (Table 1).

It can be seen that there were important differences when analyzing the proportions of victims who used or not three types of PPE, such as, for example, in edu-

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cation, where professionals with ≤ 12 years of study represent 52.64% of the victims and the lowest proportion (43.70%) of PPE use when compared to professionals with more than 12 years of study (46.60%), with differences of approximately 13% and 16% respectively, between the proportions of use and non-use of 3 or more types of PPE. As in the occupation variable, there was an increase of approximately 5% for professionals with a higher education level and a reduction of 5% for technical level professionals.

As for the characterization of accidents at work, there was a higher occurrence of percutaneous exposure typology (74.95%), the most involved biological material being that with blood and/or blood fluids (80.94%) and the causative agent being sharps (75.60%). When comparing professionals who used or did not use PPE in the accident characterization data, it can be observed that, among workers who used the equipment, there is a reduction of approximately 6% than when the causative agent was sharps (Table 1).

In the hierarchical analysis, the variables at the distal level that remained statistically significant (p<0.05) after adjustment with the other variables at this level were: age less than or equal to 40 years (PR=1.34; p<0.001) and education ≤ 12 years of study (PR=1.41; p<0.001) (Table 2).

The intermediate level variables were introduced into the model with the distal variables and, after adjustment, age ≤40 years remained statistically significant (PR=1.28; p<0.001), schooling ≤12 years of study (PR=1.39; p=0.002), technical level occupation (PR=1.23; p=0.001), informal work (PR=1.09; p=0.001), length of service less than or equal to 10 years (PR=1.29; p<0.001) or more than 20 years (PR=1.15; p=0.003) , and working in the capital or metropolitan region (RP=1.42; p<0.001) (Table 2).

In the final adjusted model of the hierarchical analysis after introducing the proximal level variables, the following maintained a statistically significant association

Table 1. Unadjusted analysis of sociodemographic and occupational characteristics and situation of accidents in relation to the use of three or more personal protective equipment in health professionals who are victims of occupational accidents with exposure to biological material in Brazil, 2010-2018.

Use of three or more PPE

Variables	Total	No	Yes	*PR	**CI	***p-value
	n=308997 (100)	n=224385 (72,62)	n=84612 (27,38)			
DISTAL VARIABLES						
Age (in years)						
≤ 40	230345 (74,55)	166402 (74,16)	63943 (75,57)	1,32	1,07-1,35	<0,001
> 40	78652 (25,45)	57983 (25,84)	20669 (24,43)	1		
Gender						
Male	63330 (20,50)	41552 (18,52)	21778 (25,74)	1,53	0,62-3,08	0,328
Female	245667 (79,50)	182833 (81,48)	62834 (74,26)	1		
Education (in years)						
≤12	162662 (52,64)	125683 (56,01)	36979 (43,70)	1,42	1,07-1,48	<0,001
>12	108315 (35,05)	68880 (30,70)	39435 (46,60)	1		
INTERMEDIATE VARIABLES						
Occupation						
Superior level	86769 (28,08)	60354 (26,90)	26415(31,22)	1		
Technical level	222228 (71,92)	164031 (73,10)	58197 (68,78)	1,18	1,06-1,27	<0,001
Work situation						
Formal	224726 (71,92)	166760 (74,32)	57966 (68,51)	1		
Informal	27728 (8,97)	17231 (7,68)	10497 (12,40)	1,12	0,94-1,16	0,142
Service time (in years)						
≤ 10	196778 (63,68)	140784 (62,74)	55994 (66,18)	1,32	1,09-1,39	<0,001
11-20	22946 (7,43)	16479 (7,34)	6467 (7,64)	1		
>20	10752 (3,48)	7515 (3,35)	3237 (3,83)	1,44	1,25-2,07	0,004
Accident location						
Capital/ Metropolitan region	156387 (50,61)	111352 (49,63)	45035 (53,23)	1,25	1,01-1,32	<0,001
Other cities	93215 (30,17)	68582 (30,56)	24633 (29,11)	1		
PROXIMAL VARIABLES						
Type of accident						
Percutaneous	231605 (74,95)	167615 (74,70)	63990 (75,63)	1,23	1,05-1,26	<0,001
Mucous	36022 (11,66)	24551 (10,94)	11471 (13,56)	1		
Percutaneous + Mucous	1330 (0,43)	865 (0,39)	365 (0,43)	0,92	0,76-0,99	0,435
Biological material involved						
Blood + bloody fluid + serum/plasma	250110 (80,94)	179615 (80,05)	70761 (83,63)	1,12	0,92-1,27	0,001
Other fluids	34989 (11,32)	25723 (11,46)	9266 (10,95)	1		
Causative agent						
Sharp drilling	233595 (75,60)	172911 (77,06)	60684 (71,72)	2,05	1,09-5,23	<0,001
Other agents	59444 (19,24)	38331 (17,08)	21113 (24,95)	1		

Source: Authors, based on interviews, 2018.
*Prevalence Ratio; **Confidence Interval; ***P value calculated from the Poisson Regression Model with robust variance.

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with not using three or more PPE: age less than or equal to 40 years (PR=1.34; p<0.001); education less than or equal to 12 years of study (PR=1.41; p<0.001); working in the capital or metropolitan region (PR=1.42; p<0.001); technical level occupation (PR=1.23; p<0.001); informal work (RP=1.09; p=0.001); length of service less than or equal to 10 years (PR=1.29; p<0.001), more than 20 years (PR=1.15; p=0.003), percutaneous exposure (PR= 1.17; p<0.001) , exposure by blood (PR=1.21; p=0.002) and exposure by sharps (PR=2.07; p<0.001) (Table 3).

The variables presented in the final model were associated with the non-use of three or more PPE during the occurrence of accidents at work with exposure to biological material. All had a prevalence ratio greater than one, that is, being a professional aged less than or equal to 40 years, having 12 years of schooling or less, working in the capital or metropolitan region, working in a technical-level occupation, having less than 10 years or less, or more than 20 years of work, having been injured due to percutaneous exposure, blood and sharps , were related to a greater chance of not using PPE in cases of accidents at work.

DISCUSSION

The prevalence of the use of personal protective equipment (PPE) found in the present study was low (27.38%) when compared to the studies by Correa et al. [1] 41.3%, carried out in Maranhão, with similar analysis methods; Cordeiro et al.[13], in Bahia, with a frequency of glove use of 69.5%, apron 36.5% and mask use of 30.7%; and the findings by Almeida et al. [21] and Vieira et al.[22], in Manaus and Florianópolis respectively, which showed that 71.0% of professionals used at least one PPE at the time of the accident.

A justification for Brazil to have a low adherence rate may be related to its status as a developing country, with a vast territorial extension leading to important differences between its regions. In the study by Mesquita et al. [23] on the temporal trend

Table 2. Adjusted analysis of the variables at the distal level, at the distal + intermediate level in relation to the non-use of three or more personal protective equipment (PPE) among health professionals injured with biological material in Brazil, 2010-2018.

Distal Variables	*PR	**CI 95%	***p-value
Age (in years)			
≤ 40	1,34	1,08-1,39	<0,001
Education (in years)			
≤ 12	1,41	1,06-1,49	<0,001
Distal Variables + intermediate			
Distal variables			
Age (in years)			
≤ 40	1,28	1,06-1,31	<0,001
Education (in years)			
≤ 12	1,39	1,00-1,42	0,002
Intermediate Variables			
Occupation			
Technical level	1,23	1,13-1,32	0,001
Situation in the labor market			
Informal	1,09	1,03-1,21	0,001
Service time (years)			
≤ 10	1,29	1,05-1,32	<0,001
>20	1,15	1,00-1,23	0,003
Accident location			
Capital/Metropolitan Region	1,42	1,25-2,87	<0,001

* Prevalence Ratio; ** Confidence Interval; ***p value calculated from the Poisson Regression Model with robust variance.
Source: authors' data, 2018.

Table 3. Final model of the hierarchical analysis of the distal + intermediate + proximal variables in relation to the non-use of three or more personal protective equipment (PPE) among health professionals injured with biological material in Brazil, 2010-2018.

Variables	*PR	**CI 95%	***p-value
Age ≤ 40 years	1,34	1,08-1,39	<0,001
Education ≤ 12 years	1,41	1,06-1,49	<0,001
Work in the capital or metropolitan area	1,42	1,25-2,87	<0,001
Technical level	1,23	1,13-1,32	<0,001
Informal situation in the labor market	1,09	1,03-1,21	0,001
Working time ≤ 10 years	1,29	1,05-1,32	<0,001
Working time > 20 years	1,15	1,00-1,23	0,003
Percutaneous exposure	1,17	1,02-1,37	<0,001
Blood exposure	1,21	1,02-1,49	0,002
Sharps exposure	2,07	1,18-3,89	<0,001

* Prevalence Ratio; ** Confidence Interval; ***p value calculated from the Poisson Regression Model with robust variance.
Source: authors' data, 2018.

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of the use of PPE in cases of accidents at work, heterogeneity can be observed in the country regarding the proportions of use of protective equipment, mainly in the North and Northeast regions.

The methodological differences of each study can also justify different values of this research, since the majority of the studies found are restricted to the isolated description of PPE or to certain professional categories, or to isolated municipalities and health institutions. Just as they differ in terms of data collection and analysis method and sample size.

In a systematic review carried out in Pakistan, the frequencies among the surveys analyzed ranged from 25 to 31% of adherence to the use of PPE. [10] In surveys carried out in China and the United States on the use of equipment in cases of respiratory outbreaks, it was observed that only 55% and 62%, respectively, had knowledge and high adherence to use. [24,25]

Even with different values between the surveys found, it is possible to observe that the use of PPE is lower than expected. And several studies describe reasons mentioned by health professionals for not using PPE, the main ones being: resistance to use, perception of ineffectiveness, lack of availability, effective lack of knowledge of the risks, lack of comfort, haste, failure in the work process , between others. [14,26,27,28]

As for the characteristics of health professionals, those aged ≤40 years were the most affected by accidents with biological material, and this variable was statistically significant in relation to the non-use of PPE. These findings may be related to inexperience, insecurity, lack of material and training on the importance of PPE, as well as not adhering to the use of PPE while carrying out work activities.

Miranda et al. [4] and Santos et al. [29] emphasize the need for training courses and enough time to adapt to the activities and routines of health services, as many health professionals enter the job market without adequate knowledge about the risks of the work environment and how to avoid them.

Females were the most affected by accidents with biological material. This finding may be related to the higher percentage of women in health institutions, especially in the nursing team, which, in turn, are the professionals most affected by accidents at work. It is important to note that many of these professionals have multiple work schedules due to low wages and still carry out household activities (domestic and family services), which prolong the personal workday, leading to physical and mental exhaustion. [30]

Despite the numerical difference between female and male victims of accidents, this variable was not statistically significant in relation to non-use of PPE. It is believed that the professional posture in facing the risk of accidents and its protective measures are similar in both sexes.

Professionals with 12 years or less of schooling were the ones who suffered the most accidents, this may be related to the characteristic of health activity in Brazil, which is predominantly carried out by professionals with less education (technical level), justified by economic issues, as these professionals have a lower hiring cost for the employer. This reality differs from that found in other countries where most health workers have higher education. [31]

It was found that having 12 (twelve) years of study or less had a greater chance of not adhering to the use of PPE, which may be related to the lack of training of these workers. Some researches [32,33] report that professionals with less time studying, such as technicians and nursing assistants, showed low percentages of adherence to PPE, especially when performing venipuncture without gloves and tracheal aspiration without a mask.

Professionals with a technical level were the main victims of accidents at work and this variable was significant in relation to adherence to PPE in the final model. Nursing assistants and technicians are the main category of victims. The high prevalence of accidents in these professionals occurs due to the direct and uninterrupted assistance provided to the patient, the frequent handling of sharps, the multiple employment relationships that generate work overload, and psychological and physical exhaustion. [32,34]

Regarding length of service, it was identified that professionals with ten years or less of work activity had more accidents. The study by Leal et al. [35] points out that workers with less training and service time spend more time in care activities with the patient. In addition, the shorter length of service may be linked to technical and training difficulties, that contribute to the exposure of professionals to occupational hazards. Some studies [30,36] report the importance of training, with an emphasis on biosafety, to reduce the number of accidents and increase adherence to the use of PPE. It should be noted that we found a greater chance of not using PPE in work accidents both in the group of professionals with 10 years or less and in professionals with more than 20 years of service. This fact may be related to the feeling of self-confidence of professionals with more than twenty years of service, as well as the inexperience of recent graduates, especially when such situations are compounded by a lack of training/qualification.

Professionals with a formal work situation had a higher prevalence of accidents. This situation may be related to the fact that professionals with a formal contract report accidents more frequently due to the rights that allow them access to social security benefits and protection under labor legislation. [37] However, workers with informal work situations were more likely not to use PPE, this fact can be explained by the fact that workers without a formal contract have greater work overload and a greater feeling of dissatisfaction related to their activities - which can affect their work practice. [30]

The highest proportions of accidents with biological material occurred in the capital/metropolitan region. This finding may be related to the number of health facilities located in these regions. This variable showed a significant risk association for non-use of PPE.

The percutaneous accident had the highest proportion and was significant in terms of non-use of PPE, with blood

being the most involved biological material and the causative agent being sharps. This fact suggests that professionals who provide direct assistance, such as nursing technicians, nurses and doctors, are more likely to have accidents and that they need more biosafety instructions. Satisfactory adherence to the use of PPE by this group of professionals is questionable and should be the target of frequent awareness raising.

The high frequency of accidents with sharp objects is a known fact, which is why the Plan for Risk Prevention of Accidents with Sharp Materials was included in NR 32, which recommends the use of personal protective equipment and the adoption of control measures such as the use of safety devices for handling sharp perforations. [8] In addition to these recommendations, several studies were carried out in order to improve aspects related to protection and adherence to the use of PPE. The systematic reviews by Verbeek et al.[9] and Moralejo et al. [7], on measures that improve adherence to standard precautions, show that constant training leads to better results, highlighting that the use of visual strategies such as videos and face-to-face simulations can increase adherence.

Mischke et al.[3], in a study on the use of gloves to prevent percutaneous accidents, based on the fact that a common surgical glove does not prevent injury,

but reduces by up to 70% the volume of blood that can be introduced in an accident with sharp punctures, they tested several options that would enhance this protection and the double glove was the most effective.

In view of the above, it can be understood that the use of personal protective equipment and the use of safe practices significantly reduce the risk of occupational accidents and infections, training and awareness of professionals regarding the proper, complete and continuous use of PPE is necessary. [28,38]

The strengths of this study are based on the relevance of the results, as it was possible to analyze the factors associated with the use of personal protective equipment in cases of accidents, using national data, not limited to municipalities and hospitals alone; as well as, studying the associated factors, it was possible to visualize the characteristics of accidents and victims, and the prevalence of the use of PPE in Brazil.

CONCLUSION

It is concluded that the prevalence of the use of PPE in cases of accidents was low among health professionals in the country. Among the factors that contributed to the occurrence of accidents at work are: informal status in the labor market, being a young adult, having a technical-level occupation, percutaneous exposure, blood and sharps.

As for the limitations, those related to the use of databases stand out (underreporting, incompleteness and inconsistencies), including the compulsory notification system, which contributes to the estimation of the researched problems. However, even with underreported and incomplete data, the results found are relevant and allowed the proposed analysis to be carried out.

The study provides subsidies for interventions on risk behavior and improvement in the quality of working conditions. In addition, it emphasizes the importance of permanent health education, to reduce the risk of accidents, with emphasis on periodic training and the routine use of personal protective equipment.

The occurrence of accidents at work among health professionals is an important public health problem that still requires epidemiological studies in Brazil, and it is not an easy task to observe the occurrence of the outcome in this population.

The results presented can contribute to the planning of health actions and management plans for the prevention of accidents at work with biological material and adherence to standard precautions, in addition to raising awareness of the importance of reporting accidents and effectively completing the forms.

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