







STANDARD PRECAUTION ADHERENCE BY NURSING WORKERS: A MIXED METHODS STUDY

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ABSTRACT

Objective: to analyze standard precaution adherence and associated factors of nursing workers at a university hospital.

Method: this is a study of mixed methods of convergent parallel strategy, carried Oct in Southern Brazil. The quantitative stage had 602 participants, using the instrument of sociodemographic and professional variables and the Instrument of Variables Related to Standard Precautions, analyzed using descriptive statistics. In the qualitative stage, a semi-structured interview was conducted with 24 workers, analyzed through content analysis.

Results: the data showed an intermediate standard precaution adherence. In the Individual Factors dimension, the Prevention Effectiveness Scale showed high scores and the Risk Personality, Risk Perception and Knowledge about Occupational HIV Transmission scales, intermediate scores. In the dimension Work-related factors, both in the Obstacles to Following Standard Precautions Scale and in the Workload Scale, the scores were intermediate. In the Organizational Factors dimension, low scores were found for Climate of Safety and Training in Prevention of Exposure to the Human Immunodeficiency Virus and intermediate for Personal Protective Equipment Availability. Qualitative data showed that workers often select patients who they think are at greatest risk for occupational transmission to use standard precautions.

Conclusion: standard precaution adherence does not occur fully among participants. Data integration allowed to conclude that, among the main elements that influence this phenomenon, is the lack of clarity of participants as to the purpose, indication and principles of standard precautions.

DESCRIPTORS: Worker's Health. Occupational Risks. Universal Precautions. Nursing. Containment of Biohazards.

HOW CITED: Cunha QB, Freitas EO, Pinno C, Petry KE, Silva RM, Camponogara S. Standard precaution adherence by nursing workers: a mixed methods study. *Texto Contexto Enferm* [Internet]. 2021 [cited YEAR MONTH DAY]; 30:e20200240. Available from: <https://doi.org/10.1590/1980-265X-TCE-2020-0240>

ADESÃO ÀS PRECAUÇÕES PADRÃO POR TRABALHADORES DE ENFERMAGEM: ESTUDO DE MÉTODOS MISTOS

RESUMO

Objetivo: analisar a adesão às precauções padrão e os fatores a ela associados de trabalhadores de enfermagem de um hospital universitário.

Método: estudo de métodos mistos de estratégia paralelo convergente, realizado na Região Sul do Brasil. A etapa quantitativa teve 602 participantes, sendo utilizados o instrumento de variáveis sociodemográficas e profissionais e o Instrumento de Variáveis Relativas às Precauções-Padrão, analisados mediante estatística descritiva. Na etapa qualitativa, realizou-se entrevista semiestruturada, com 24 trabalhadores, analisada mediante análise de conteúdo.

Resultados: os dados evidenciaram uma adesão intermediária às precauções padrão. Na dimensão Fatores Individuais, a escala Eficácia da Prevenção mostrou escores elevados e as escalas Personalidade de Risco, Percepção de Risco e Conhecimento da Transmissão Ocupacional do Vírus da Imunodeficiência Humana, escores intermediários. Na dimensão Fatores Relativos ao Trabalho, tanto na Escala de Obstáculos para Seguir as Precauções Padrão como na Escala de Carga de Trabalho, os escores foram intermediários. E, na dimensão Fatores Organizacionais, verificaram-se escores baixos para Clima de Segurança e Treinamento em Prevenção da Exposição ao Vírus da Imunodeficiência Humana e intermediário para Disponibilidade de Equipamento de Proteção Individual. Os dados qualitativos evidenciaram que o trabalhador muitas vezes seleciona o paciente que julga apresentar maior risco de transmissão ocupacional para utilizar as precauções padrão.

Conclusão: a adesão às precauções padrão não ocorre de forma integral entre os participantes. A integração dos dados permitiu concluir que, entre os principais elementos que influenciam esse fenômeno, está a falta de clareza dos participantes quanto à finalidade, indicação e princípios das precauções padrão.

DESCRITORES: Saúde do trabalhador. Riscos ocupacionais. Precauções universais. Enfermagem. Contenção de riscos biológicos.

CUMPLIMIENTO DE LAS PRECAUCIONES ESTÁNDAR POR PARTE DE LOS TRABAJADORES DE ENFERMERÍA: UN ESTUDIO DE MÉTODOS MIXTOS

RESUMEN

Objetivo: analizar el cumplimiento de las precauciones estándar y los factores asociados de los trabajadores de enfermería en un hospital universitario.

Método: estudio de métodos mixtos de estrategia paralela convergente, realizado en la Región Sur de Brasil. La etapa cuantitativa contó con 602 participantes, utilizando el instrumento de variables sociodemográficas y profesionales y el Instrumento de Variables Relativas a Precauciones Estándar, analizados mediante estadística descriptiva. En la etapa cualitativa se realizó una entrevista semiestructurada a 24 trabajadores, analizada mediante análisis de contenido.

Resultados: los datos mostraron una adherencia intermedia a las precauciones estándar. En la dimensión de Factores Individuales, la escala de Efectividad de la Prevención mostró puntajes altos y las escalas de Personalidad de Riesgo, Percepción de Riesgo y Conocimiento de Transmisión Ocupacional del Virus de Inmunodeficiencia Humana, puntajes intermedios. En la dimensión de factores relacionados con el trabajo, tanto en la escala de obstáculos para seguir las precauciones estándar como en la escala de carga de trabajo, los puntajes fueron intermedios. En la dimensión de Factores Organizacionales, hubo puntajes bajos para Clima de Seguridad y Capacitación en Prevención de Exposición al Virus de Inmunodeficiencia Humana y un intermediario para Disponibilidad de Equipo de Protección Personal. Los datos cualitativos mostraron que el trabajador a menudo selecciona al paciente que cree que tiene mayor riesgo de transmisión ocupacional para usar las precauciones estándar.

Conclusión: la adherencia a las precauciones estándar no ocurre completamente entre los participantes. La integración de los datos permitió concluir que, entre los principales elementos que influyen en este fenómeno, se encuentra la falta de claridad de los participantes en cuanto al propósito, indicación y principios de las precauciones estándar.

DESCRIPTORES: Enfermería del Trabajo. Riesgos Laborales. Precauciones Universales. Enfermería. Contención de Riesgos Biológicos.



INTRODUCTION

Working in a hospital environment constantly exposes workers to occupational risks that can influence their health. The nursing team, in turn, is the most susceptible, especially when it comes to biological risk, since it is the professionals who work directly in patient care and often perform various procedures that expose them to contact with blood and body fluids¹.

From contact with biological material, nursing workers are exposed to pathogens such as the Hepatitis B virus, Hepatitis C and Human Immunodeficiency (HIV)¹. A review study on occupational accidents with nursing professionals revealed, as the main group of accidents, injuries with sharps, followed by contamination by contact of the skin and mucosa with blood and secretions, falls, injuries resulting from physical exertion and commuting accidents. Accidents with exposure to biological material represent a serious problem, both due to the frequency with which they occur, and the severity of the impact on professionals' health, considering that the possibility of transmission of serious infectious diseases is related, in most cases, to that type of accident².

In order to reduce accidents with biological material, standard precautions (SPs) were established by the Center for Disease Control and Prevention (CDC), in the 1980s. These measures aim to control exposure to occupational risks present in health services, especially with regard to contact with substances and body fluids, in addition to ensuring safe patient care, preventing infections in the provision of care³.

However, despite the existence of legislation that contemplates these measures, studies⁴⁻⁵ indicate that the SP adherence by nursing workers is below the recommended level, increasing the vulnerability of these workers to occupational accidents and illnesses. The knowledge of the factors that are associated with SP adherence is extremely relevant for the planning of preventive strategies in the scope of workers' health. These strategies must be based on interventions that involve both behavioral, managerial and organizational actions, in order to overcome the individual approach, adopted by most organizations until today.

Thus, it is considered important to study the level of SP adherence by nursing workers in the hospital environment and the factors that are associated, in order to enable the creation of strategies that seek to ensure safety in the work environment, as well as to workers' health. Bearing in mind that the research object is a complex phenomenon that encompasses the multiple facets of human behavior within organizations, it is pertinent to use robust and differentiated analyzes that investigate the problem in depth. In this sense, it is believed that the combination of approaches through mixed methods is a relevant and innovative option to assist in a deeper understanding of this object of study.

To outline this investigation, the following research question was elaborated: what is the perception and the level of adherence of nursing workers in the hospital context to SPs, as well as about the factors associated with it? Thus, this study aimed to analyze SP adherence and the associated factors of nursing workers at a university hospital.

METHOD

This is a study of mixed methods of convergent parallel strategy (QUAN + QUAL), that is, in which the same weight was attributed to data from quantitative and qualitative approaches. The method and strategy were chosen with the intention of comparing the findings of the two approaches, in order to determine convergences, differences and combinations, seeking complementarity through data integration⁶.

The study took place at a public university hospital in southern Brazil. For study organization and design, the care units of the institution were grouped by the researchers in eight major areas: hospitalization; surgical/obstetric; intensive therapy; hemato-oncology; emergency room; psychiatry; support services and outpatient services.

The population was composed of nursing workers: nurses, technicians and nursing assistants. During the data collection period, the total number of nursing workers was 793. The inclusion criteria were: being in care activities and having experience time equal to or greater than six months, in the current work unit. The exclusion criteria were: being on leave or away for any reason, during the data collection period; and/or have a direct link to the research group promoting the investigation. Data were collected during the year 2016.

The quantitative stage was characterized by a cross-sectional study. Of the 685 workers who met the inclusion criteria, 21 refused to participate and 62 did not return the completed instruments. Thus, 602 nursing workers participated in the quantitative stage (87.9% of the total population).

For this data collection, two instruments were used: instrument of sociodemographic and professional variables (built by the researchers) and Instrument of Variables Related to Standard Precautions. The second instrument was translated and validated for the Brazilian reality by Brevidelli and Cianciarullo⁷, being composed of 10 Likert-type psychometric scales with 57 items, whose answer options vary progressively from 1 (totally agree) to 5 (totally disagree) or from 1 (always) to 5 (never). The scales that make up this instrument are organized in three dimensions: 1) Individual Factors: comprise the items referring to the SP Adherence Scale, the Knowledge about Occupational HIV Transmission Scale, the Risk Perception Scale, the Personality Risk Scale and Prevention Effectiveness Scale; 2) Factors related to Work: involve the Obstacles to Following SP Scale and the Workload Scale; 3) Organizational Factors: comprise the Safety Climate Scale, the PPE Availability Scale and the Training Scale in Prevention of Exposure to HIV. Responses were analyzed using the mean of the scores achieved, which were classified as high (≥ 4.5), intermediate (3.5 to 4.49), and low (<3.5).

Data went through independent double typing and were organized in an electronic spreadsheet in the form of a database, using the program Excel version 6.4. After checking for errors and inconsistencies, data analysis was performed using PASW Statistics (Predictive Analytics Software, from SPSS Inc., Chicago, USA), version 18.0. The descriptive analysis of the variables (relative frequency, measures of central tendency and dispersion) was carried out and Cronbach's alpha coefficient was applied to verify the scales' internal consistency. The alpha value considered satisfactory was ≥ 0.6 ⁸.

The qualitative stage consisted of semi-structured interviews, with three workers from each assistance area, who were drawn according to the inclusion and exclusion criteria established and mentioned in the quantitative stage. Thus, 24 nursing workers were interviewed: nine nurses, 11 nursing technicians and four nursing assistants. Interviews were interrupted when theoretical data saturation was reached⁹.

The interviews took place individually, in the workplace, in a private environment, lasting between 15 and 50 minutes, based on a script previously built-in line with the quantitative instrument's dimensions. They were recorded on a digital micro-recorder - MP3 player and later transcribed in full using Microsoft Office Word[®]. After that, the forms were submitted to Bardin's content analysis⁹. Initially, text skimming of the Sept of available material was carried out (1st phase - pre-analysis); afterwards, material exploration and analysis (2nd phase) was carried out, characterized by coding. Coding corresponds to a transformation of the material into a representation of content, in order to provide information on the general characteristics of the material, in order to subsidize the establishment of indexes and the aggregate of units¹⁰. It is noteworthy that, after coding, the data were grouped into

previously defined categories according to the research objective and investigated object, considering that this is a possible strategy for categorization in content analysis. Finally, the treatment of results obtained and interpretation was carried Oct (3rd phase).

After the statistical analysis of the numerical data and categorization of all interviews, the quantitative and qualitative findings were integrated, seeking to identify convergences, differences and combinations, in order to respond to the objectives, through the complementarity of information, which allowed for greater comprehension when looking launched on the phenomenon of SP adherence.

To carry Oct the study, the Researcher's Confidentiality or Responsibility Term was used, guaranteeing participants' anonymity, in addition to the Informed Consent Form for data collected from nursing workers. Statements were identified by codes composed of the letter "N" for nurses, "T" for nursing technicians and "A" for nursing assistants, followed by numbers associated with the order in which the interviewee was integrated into the research.

RESULTS

Among the workers who participated in the quantitative stage, there were 186 nurses (31.3%), 324 nursing technicians (54.4%) and 85 nursing assistants (14.3%). Most were female (87.5%) and were between 20 and 69 years old, with an average age of 41 (\pm 9.46) years. Professional training time ranged from 6 months to 40 years, with an average of 15 (\pm 9.23) years. Of all participants, 346 were linked to the institution through the Consolidation of Labor Laws (CLT) (58.35%); 244, by the Single Legal Regime (SLR) (41.15%); three had both bonds (0.51%). As for training on SPs, 412 (70.3%) professionals responded that they received training at the hospital.

The descriptive measures of the scales that make up the Instrument of Variables Related to Standard Precautions are presented in Table 1.

Table 1 – Mean, standard deviation, median, variation and Cronbach's alpha of the scales that make up the Instrument of Variables Related to Standard Precautions. Santa Maria/RS, Brazil, 2016 (n=602).

Scales	Mean	SD*	Median	Minimum	Maximum	Cronbach's Alpha
SP adherence**	4.30	1.03	4.33	2.50	5.00	0.653 †
Individual factors						
Risk personality	4.24	0.90	4.25	1.50	5.00	0.781
Prevention effectiveness	4.53	0.67	4.50	2.00	5.00	0.680‡
Risk perception	3.99	1.12	4.00	1.00	5.00	0.675
Knowledge about occupational HIV transmission	4.29	1.02	4.43	1.00	5.00	0.892
Work-related factors						
Obstacles to following SP	3.77	1.10	3.83	1.67	5.00	0.709
Work load	4.07	0.77	4.00	1.33	5.00	0.779
Organizational factors						
Safety climate	3.33	1.06	3.42	1.17	4.92	0.849
Occupational exposure prevention training	3.26	1.09	3.25	1.00	5.00	0.795
PPE availability***	3.82	0.99	4.00	1.00	5.00	0.813

*SD - standard deviation; **SP - standard precautions; ***PPE - personal protective equipment; †Value obtained with the exclusion of item 11 from the original scale; ‡Value obtained with the exclusion of item 1 from the original scale.

SP adherence was assessed using one of the scales that make up the Instrument of Variables Related to Standard Precautions. This scale contains 13 items, described in Table 2.

Table 2 – Distribution of nursing workers, according to the responses that make up the Standard Precaution Adherence Scale. Santa Maria/RS, Brazil, 2016 (n=602).

Scale items	1*		2 †		3 ‡		4 §		5	
	F	%	f	%	F	%	f	%	f	%
1. Disposes perforating and cutting objects in proper containers.	589	97.9	11	1.8	02	0.3	0	0	0	0
2. Treats all patients as if they were contaminated by HIV.	240	39.9	173	28.7	112	18.6	39	6.5	38	6.3
3. Follows all SP with all patients, regardless of their diagnosis.	278	46.2	212	35.2	97	16.1	12	2.0	03	0.5
4. Washes hands after removing disposable gloves.	503	83.6	85	14.1	11	1.8	01	0.2	02	0.3
5. Wears a protective apron when clothes can be dirty with blood or another secretion.	299	49.7	180	29.9	91	15.1	17	2.8	15	2.5
6. Wears disposable gloves in situations of possible contact with blood or another secretion.	483	80.2	101	16.8	16	2.6	01	0.2	01	0.2
7. Wears safety goggles in situations of possible contact with blood or another secretion.	132	21.9	149	24.7	145	24.1	95	15.8	81	13.4
8. Wears a disposable mask in situations of possible splash of blood or another secretion.	221	36.7	165	27.4	126	20.9	66	11.0	24	4.0
9. Cleans immediately with a disinfectant all spills of blood or another secretion.	320	53.1	153	25.4	71	11.8	35	5.8	23	3.8
10. Handles with care scalpels or other perforating and cutting objects.	564	93.7	25	5.0	05	0.8	06	1.0	02	0.3
11. Recaps needles to puncture patients' veins.	30	5.0	37	6.1	102	16.9	124	20.6	309	51.3
12. Wears gloves to puncture patients' veins.	261	43.3	142	23.6	121	20.1	61	10.1	17	2.8
13. Considers all materials in contact with patients' saliva as contaminated.	451	74.9	87	14.4	43	7.1	18	3.0	03	0.5

*Always; † Many times; ‡ Sometimes; § Rarely; || Never.

According to Table 2, SP for greater adherence refers to the disposal of sharps in their own containers, and the one with the least adherence refers to the use of protective goggles when there is a possibility of splashing the eyes with blood or other secretions.

In the qualitative stage, the data were organized into four categories previously defined according to the quantitative data collection instrument so that the data could be compared, seeking complementarity, as provided by the methodological design used. The first category, Standard precaution adherence, presents the study participants' perception of the problem. The other categories grouped the factors that are related to SP adherence, according to the quantitative instrument, which are: Individual factors, Work-related factors, and Organizational Factors. The Chart 1 shows the statements, together with the average and classification of the scores for each domain, already showing an approximation between quantitative and qualitative data.

Chart 1 – Statements of participants guided by the scale domains that make up the Instrument of Variables Related to Standard Precautions and their respective average and score classification among nursing professionals. Santa Maria/RS, Brazil, 2016.

Categories/ Domains	Statements			
	<p>SP adherence (Me¹=4.30) INTERMEDIATE</p>			
	<p>[...] gloves people use, and in isolation we use masks... garbage disposal is, I believe, if not 100%, close to that, appropriate. We haven't had accident with sharps for a long time, we dispose of it properly. It is a matter of biological material, of secretion exposure, it is a difficult thing for you to see people wearing goggles and a mask, it is a habit that workers in this sector do not have (N11). In general, we take care of ourselves, the girls [referring to their co-workers] wear gloves; everyone wears gloves, but what I use here the most is the apron when I am going to treat injuries, the apron and the goggles [...]. I see that the girls [referring to the nursing team] try to use a lot PPE, and another thing, the environment's cleanliness. Care with material disposal is very serious, we always try to do it strictly [...] (N02). Very little. Almost nobody uses it, almost nobody cares about it, because they think it happened to the colleague because it had to happen, understand? So, there is very little precaution (T10). [...] there are all kinds of patients here. So, we don't know about the diseases they have and it can be transmitted to us. But we try to be cautious when we see that there is a suspect of something (A05).</p>			
Individual factors	<p>Risk personality (Me=4.24) INTERMEDIATE</p>	<p>Prevention efficacy (Me=4.53) HIGH</p>	<p>Risk perception (Me=3.99) INTERMEDIATE</p>	<p>Knowledge about occupational HIV transmission (Me=4.29) INTERMEDIATE</p>
<p>[...] but is the person himself who is resistant to using PPE [...]. I think it goes from person to person. There are people who are aware, have training and, even so, they don't wear anything, unfortunately, nor do they wear gloves (T01). I usually follow the rules, with the exception of some precautions, such as wearing gloves. I don't always use gloves for venipuncture ... I don't see the neglect of not using it as a negligence, it's a risk I'm taking ... I know that [...] (N02).</p>	<p>[...] I feel safe, because I have some control over the risks. We prevent ourselves, wear a glove, wear an apron and, even so, there is a risk that, even if taking care, an accident may still happen (N16). [...] following the protocol [...] you can prevent yourself from getting hurt, from contracting anything. So, this is it, I try, particularly to always follow (T04).</p>	<p>It seems that it is that feeling that it will not happen to me, perhaps, because it does not give real importance to prevention. I don't know if we deny this risk, [...] so, I can work less anxiously [...] (N11). Nurses, very stubborn beings, think that nothing will happen to them, that the aura of the profession protects [...] because people have a lot of difficulty: "Ah, nothing will happen to me"... until it happens (N07)</p>	<p>[...] I feel calm about it because I have the information, we have the POPS, we have the biosafety manual [...] (N16). [...] there is a service that is the infectious disease service, which assists AIDS patients [...] we work a lot with injuries that can provide us with some infections, depending on whether we have a fissure or some skin lesion that we don't notice and we get in touch with these secretions, even if we take care (N02).</p>	

¹ Me: mean
SP: standard precautions

Chart 1 – Cont.

Statements	
Categories/ Domains	
Work-related factors	<p>Obstacles to following SP (Me=3.77) INTERMEDIATE</p> <p>[...] I lose a little dexterity to do venipuncture with gloves, so, depending on it, I end up puncturing without the glove, but, consciously, it is an option, but I am aware that I should (N02).</p> <p>[...] safety goggles, we report that they are heavy, uncomfortable, but, as they are a protective measure, they will not be comfortable, they were not made to be comfortable, they were made to protect you to protect you, they have to have that heavy lens [...] (T18).</p>
Organizational factors	<p>Safety climate (Me=3.33) LOW</p> <p>[...] I think the institution goes to great lengths to give us the information it needs, too, in relation to providing everything that is necessary, but I think that suddenly it needs to charge more. I think you need to charge more, I don't know how, but there would have to be something more rigorous about that [use of SP] [...] (T22).</p> <p>There is an alcohol dispensation, but you can see that people don't use it, much less wash their hands when they should, the right thing would be between one patient and another, always hand hygiene... so, I realize that they even do it, but not in the way that it should be, and that, certainly, should be charged much more (T22).</p>
	<p>Training in exposure prevention (Me=3.26) LOW</p> <p>[...] there is training, but not everyone participates [...] but I don't know if they can accommodate the large number of professionals, to sit and explain, or if it is the lack of interest of each one (T10).</p> <p>I think that what could help more is risk awareness work [...] but it has to be a kind of continuous work, there is no use someone came to give a lecture about it and disappear, that normally people come, speak, it is given a lecture, a work, in short, it is presented and then that is not continued [...] it has to be remembered, it has to be worked on, it has to be given importance [...]. (N03).</p>
	<p>PPE availability (Me=3.82) INTERMEDIATE</p> <p>Because the material has, we have the PPE, it's not a lack of it, we have (N07).</p> <p>[...] everything is close, we can be less contaminated ... because there on the floor [referring to the inpatient unit] there is no nearby, so you had to run and get it, or you would go to see the patient and you would not leave without answering for because of the material, or even vomiting, if there was no glove there, I had to get it and find a way (A05).</p>
	<p>Work load (Me=4.07) INTERMEDIATE</p> <p>[...] there's a lot to do [...] in the end, you overload you and you become even more susceptible, because you have less time to be dressing up, to be washing yourself properly [...] (T21).</p> <p>[...] a greater number of patients ... if you have one, two, there is no reason for you not to use it and you will have time to do things well. But in the emergency room, you have 30, 40 patients [...] (T12).</p>

Participants' reports showed that the factors associated with SP adherence act synergistically, influencing workers' attitudes in their daily work. SP adherence is performed selectively, oscillating between moments of high adherence and moments of low adherence by the same individual, according to their perception of momentary risk. Workers select patients or the procedure they believe offers the greatest risk; In this way, it is clear that the purpose of SP is not well understood by many professionals, as they relate the use of precautions to the diagnosis of infectious and contagious disease in patients.

In this sense, subjectivity is an important issue to be considered in this problem. Sometimes, anxiety about constant exposure to a risk leads to a defensive strategy that becomes the flight or the denial of the risk, which can hinder the adoption of preventive practices. Additionally, nursing work is permeated with unpredictable events, reflecting the complexity of care for human beings. Thus, some obstacles related to this work are mentioned by workers: increased technical difficulty when using PPE; physical discomfort caused both by the PPE itself and by the heat and the closed environment; excess of work; prioritize patients' needs above professional safety, especially in urgent situations, among other aspects. Furthermore, inadequate physical structure and work organization, and weaknesses in the institution's performance in relation to biosafety standards are some elements that were also identified in the statements.

Through analysis of quantitative and qualitative data, complementary information was obtained, which generated metainferences that will be presented and discussed below.

DISCUSSION

As for SP adherence, in general, the reports showed that adherence is not constant, oscillating between high and low adherence moments, which justifies intermediate SP adherence ($M=4.30 \pm 1.03$), measured by the SP Adherence Scale, demonstrating convergence between the two approaches used. This result is in line with other Brazilian and international studies¹¹⁻¹². Além disso, os achados apontam que as SP são realizadas de forma seletiva. Por exemplo, com Regarding the use of PPE, the use of gloves (80.2%) is the most present in the daily lives of workers; however, the use of protective goggles (21.9%), mask (36.7%) and apron (49.7%) has not yet been significantly incorporated. These data corroborate with a study developed in a psychiatric hospital in the countryside of the state of São Paulo, Brazil, where a low adherence to these PPE was evidenced¹³.

In contrast to these findings, a study developed with 40 nurses working in critical patient units (UPCs) recognized the importance of using gloves (95.0%), mask and/or face shield (97.5%), goggles (100.0%) and apron (97.5%) to perform procedures in which there is the possibility of splashing blood, body fluid, secretion or excretion¹⁴.

In the present study, it was evidenced that workers were not sufficiently clear about the basic principles that guide SP. About 40% answered that they always treated patients as if they were infected with HIV and 46% answered that they followed SP with all patients, whatever their diagnosis. Additionally, the statements signaled that preventive measures will be used more diligently after confirmation of a diagnosis of infectious disease. These results demonstrate how the basic principles of SP were poorly understood by workers.

In this perspective, a research carried Oct in the State of Rio Grande do Sul (RS), which used Convergent Care Research (CCR) as an investigation approach, identified that workers, from the reflection of their work process, concluded that, several times, placed themselves at risk and recognized that the institution provided the necessary means for the work to be carried Oct safely¹⁵.

In the present study, although there was an 80.2% percentage of use of disposable gloves, this number was reduced to almost half (43%) during venipuncture, showing that this care is neglected by many nursing workers. Qualitative data complement this finding, given that the participants reported being aware that they were taking the risk of becoming infected, as they did not use adequate

protection during this procedure. Moreover, some participants mentioned the increased technical difficulty to perform venipuncture with the use of gloves, which indicates that this may be the main obstacle regarding the use of PPE in this procedure. It is known that the performance of venipuncture is considered one of the procedures with the highest risk of exposure to blood of patients during care. In this sense, it is considered that, to change these behaviors, it is necessary to expand the perception and knowledge of these risks with these workers¹⁶.

As for needle recapping, widely discussed as an unsafe practice prohibited by Regulatory Standard 32¹⁷ it is observed that it is still present in the exercise of nursing workers. About 11% stated that they always or often recap used needles. This finding is corroborated by a Brazilian study in which 47.5% replied that they did not recap needles or performed only the passive encapsulation and 22.5% did so frequently¹⁴. In a survey conducted in Afghanistan, 57.8% of respondents reported that they always recap needles in their daily practices¹⁸. Thus, it is considered that needle recapping is still common in health work practices, since it was represented by a large number of professionals who continued to perform this practice, in different scenarios.

Approximately 86% of the participants replied that they always performed hand hygiene after removing the gloves, which is less than expected, considering that NR 32¹⁷ provides that the use of gloves does not replace the hand washing process, which must occur at least before and after using them. The qualitative findings are also disturbing, since, for the study participants, the SP were more related to the use of PPE, and hand hygiene was not mentioned by most of them as part of these measures.

A Brazilian survey identified that, despite being extensively studied and disseminated, there are still professionals who do not know how to recognize the need for hand hygiene in situations such as between caring for different patients, after removing gloves and performing procedures that involve risk of contact with blood, secretion or excretion of patients¹⁴. Hand hygiene is a priority in health programs and actions aimed at patient safety, and workers' adherence to this practice and the institutional resources for this are considered essential to provide safe and quality care¹⁹. According to the Brazilian National Health Regulatory Agency (ANVISA - *Agência Nacional de Vigilância Sanitária*), this is the most important and least expensive procedure to prevent the transmission of healthcare-associated infections (HAIs)²⁰.

In the analysis of the factors that can influence SP adherence, it is highlighted that, among the individual factors, the perception of workers regarding the efficiency of SPs was high. Qualitative data partially corroborate this result, as workers stated that they believe that the proper use of protective measures reduces exposure to risks, but does not completely eliminate it. In this sense, authors emphasize that the perception of inefficiency of protection measures can influence the attitudes adopted in situations of risk²¹.

Regarding the Risk Personality scale, which includes items such as "taking risks" and "being exposed to dangerous situations just by emotion", the average score showed that workers had moderate risk personality traits. This result can be explained by the statements, in which some workers mentioned resistance to the use of PPE as a characteristic of some individuals and which results in attitudes that expose them to risk. On the other hand, participants reported that maintaining a "calm" attitude in the face of risk is necessary for effective care delivery, reducing worker anxiety.

The risk personality and risk perception are factors that can interfere with SP adherence, so it is recommended to create institutional strategies aimed at changing behaviors, without blaming workers, but seeking to involve them in this process. Thus, the complexity of this issue is perceived, which demonstrates the need for further investigations that seek to understand in depth the relationships between the perception of risk of individuals in their work practices, especially in issues related to biological risk.

As for workers' knowledge of occupational HIV transmission, the study participants, for the most part, had an intermediate level of knowledge. Qualitative data revealed that participants attributed importance to knowledge when adopting safety practices. A study that used the same data collection instrument, but with a population of dental professionals, showed high levels of knowledge of occupational HIV transmission²². This knowledge, acquired already during the training, needs to be deepened throughout the professional career. The work institution itself must offer these opportunities and workers also need to commit to this issue.

Similar findings were verified regarding the knowledge of ICU workers, in which 97.2% of the participants agreed that occupational transmission of HIV can occur in an accident with sharps coming from HIV patients and 92.1% agreed that it can occur in cases of blood splatters and secretions²³.

Regarding work factors, it was shown that the perception of workers regarding the existence of obstacles to follow SP was moderate. In the statements, the workers reported some of the difficulties related to work that ended up preventing the performance of safety practices in certain circumstances. This finding has also been found in other studies. Research with nurses and nursing technicians showed that many believed that some PPE hindered the development of techniques²⁴.

The Workload Scale, which addresses issues related to the requirement for agility and work demands, also demonstrated an intermediate perception of workers. Qualitative data indicate that the workload was variable in the different sectors in the hospital and the sectors that had the highest workload were those that treated patients in critical condition, with great instability of the organic systems, and that, therefore, had a demand high level of care for the nursing team. Participants considered that a very high workload can interfere with workers' safety, making SP adherence difficult. Accordingly, a study showed that, in China, frequent occupational exposures took place due to the shortage of nurses and the increased workload²⁵.

The organizational factor comprises important and influencing elements in the adoption of protective measures by workers. The safety climate is one of those elements that presented a low score. This result corroborates the qualitative data, insofar as the workers signaled little incentive and organizational support for the adoption of SP. It is noteworthy that the safety climate is considered the measurable component of the safety culture which, when positive, is capable of promoting the behavioral translation of knowledge. A study showed that an organization's environment can affect the incidence of occupational exposures, as health professionals who had more frequent managerial support in relation to the security environment were more likely to adhere to SP, compared to those who had less frequent support²⁶.

The literature points out some important organizational actions for the prevention of occupational exposure: involvement of management to encourage SPs and build a culture of safety; correction of unsafe practices by supervisors; application of possible measures to reduce dangerous tasks and procedures; awareness of teams about the need to participate in occupational safety management²⁷.

Training in the prevention of occupational HIV exposure was negatively assessed by the nursing workers in the study. Although 70% stated, in the sociodemographic and professional questionnaire, that they received training at the hospital, the Prevention Training Scale analysis showed low scores, indicating that this training may not have met the need to train workers on this subject. specific way. These data are corroborated by the interviews carried out, since the statements showed that, although the institution is engaged in providing education to workers on an ongoing basis, some issues still needed to be improved so that there was better adherence to safety practices.

According to a study carried out in Nigeria, participants who received training in SP and/or use of PPE used more PPE while working, when compared to their untrained colleagues. The authors concluded that the training of health professionals is a predictor of SP adherence. In addition, training serves as a reminder of past knowledge and revitalizes good practice²⁸.

Regarding PPE availability, the score showed an intermediate perception of workers. Qualitative data integrate this result. Participants stated that equipment for more routine use, such as gloves and aprons, was always available. However, some equipment more specific to the needs of some different locations was scarcer, which can compromise safety in some special procedures. Moreover, the statements pointed out that the organization of PPE in workplaces is extremely relevant, considering the need for them to be easily accessible to worker, at the time of carrying out the procedures.

This finding should be better observed by management and institutions, since health professionals who do not have easy-to-access personal protective equipment are less likely to adhere to SP, compared to those who have easy-to-use personal protective equipment access²⁶. In addition to compromising professionals' safety, PPE lack or unavailability also increases the risk of cross-transmission of microorganisms between patients, which affects the quality and safety of care.

As for the limitations of the study, it is pointed out that the data were collected in only one hospital, limiting the generalization of the results obtained. In addition, the limitations inherent to the data obtained through self-report are highlighted, in which memory bias may occur, since individuals may have their memories of past behaviors affected by exposure to recent events. Thus, it is recommended that new studies add data collection techniques, such as observation, for example, in order to minimize this type of information bias.

It is noteworthy that, despite the possible limitations, the SP Adherence Scale presented good reliability for the studied population and it is an instrument that is easy to understand and apply. Thus, it is suggested that it can be used routinely in this and other health services, to identify the levels of SP adherence.

It is recommended to implement institutional policies aimed at conducting in-service training with a focus on adequate knowledge in relation to SP and workers' risk perception. Other recommendations include investments to improve access to PPE, greater management involvement in monitoring and encouraging safe practices and encouraging all workers to be responsible for managing issues related to health and safety at work.

CONCLUSION

It is concluded that nursing workers do not fully adhere to the recommended safety measures for the prevention of infectious diseases that can be acquired during the work period.

Among all the factors that can influence this result, the integration of the data obtained allowed us to conclude that, among the main elements that influence this phenomenon, is the lack of clarity of the professionals as to the purpose, indication and principles of SPs. Workers often select patients and procedures that they believe offer the greatest risk of contamination, disregarding that precautions should be used with all patients and in all procedures that may pose risks.

In addition, the underestimation/denial of risk was found both in the numerical findings and in the statements of the participants. The perception evidenced by responses such as "nothing bad will happen to me" indicates the need to direct training to raise awareness of the risk to which they are really exposed. In addition, it is recommended that the training focus on facing the difficulties that can be verified for adherence to these measures. These difficulties, which range from discomfort during the use of PPE to the increase in technical difficulty during procedures, must be overcome through continuous training with the entire nursing team.

It is also considered extremely important, to increase SP adherence, management engagement in issues related to security, considering that organizational factors were the ones that obtained the worst evaluation when measuring quantitative data. The results of the two approaches point to

important weaknesses in this regard, especially with regard to the security climate, which can be improved through the direct involvement of managers, with the application of measures to reduce dangerous practices and procedures, as well as in the realization of feedback by supervisors to their work teams, within the hospital context.

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NOTES

ORIGIN OF THE ARTICLE

It is part of a dissertation - *Adesão às precauções padrão por trabalhadores de enfermagem de um hospital universitário: estudo de métodos mistos*, presented to the Graduate Program in Nursing at *Universidade Federal de Santa Maria* in 2017.

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APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research with Human Beings of the *Universidade Federal de Santa Maria*, under Opinion 1,106,936 and CAAE (Certificate of Presentation for Ethical Consideration) 45318815.0.0000.5346.

CONFLICT OF INTEREST

There is no conflict of interest.

EDITORS

Associated Editors: Selma Regina de Andrade, Gisele Cristina Manfrini, Elisiane Lorenzini, Monica Motta Lino.

Editor-in-chief: Roberta Costa.

HISTORICAL

Received: June 18, 2020.

Approved: September 14, 2020.

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