

Adherence to standard precautions of nurses working in intensive care at a university hospital*

ADESÃO ÀS PRECAUÇÕES-PADRÃO POR PROFISSIONAIS DE ENFERMAGEM QUE ATUAM EM TERAPIA INTENSIVA EM UM HOSPITAL UNIVERSITÁRIO

ADHESIÓN A LAS PRECAUCIONES ESTÁNDAR DE PROFESIONALES DE ENFERMERÍA ACTUANTES EN TERAPIA INTENSIVA DE UN HOSPITAL UNIVERSITARIO

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ABSTRACT

This study evaluated individual factors relating to work and the organization, related to adherence to standard precautions for nurses working in intensive care. It was a cross-sectional study conducted in a large hospital with 178 professionals. For data collection, Likert-type psychometric scales were used. In the Adherence Scale to Standard Precautions we obtained a score of 4.45 (SD=0.27), classified as intermediate. There was a correlation when compared with the individual risk factors of the Scale of the Risk Personality ($r=-0.169$, $p=0.024$) and the factors related to working with the barriers of the Scale for following standard precautions ($r=-0.359$, $p=0.000$). Adherence to standard precautions among the nursing professionals was intermediate. Individual factors and factors related to work influenced the adherence to standard precautions.

DESCRIPTORS

Universal precautions
Intensive care
Nursing, team
Occupational health

RESUMO

Este estudo avaliou fatores individuais, relativos ao trabalho e organizacionais relacionados à adesão às precauções-padrão por profissionais de enfermagem que atuam em terapia intensiva. Estudo de corte transversal, realizado com 178 profissionais em um hospital de grande porte. Para a coleta de dados foram utilizadas escalas psicométricas do tipo Likert. Na Escala de Adesão às precauções-padrão obteve-se um escore de 4,45 (DP=0,27) classificado como intermediário. Houve correlação quando comparada com fatores individuais para Escala de Personalidade de Risco ($r=-0,169$; $p=0,024$) e fatores relativos ao trabalho com a Escala de Obstáculos para seguir as precauções-padrão ($r=-0,359$; $p=0,000$). A adesão às precauções-padrão entre profissionais de enfermagem foi intermediária. Fatores individuais e relativos ao trabalho influenciaram a adesão às precauções-padrão.

DESCRIPTORIOS

Precauções universais
Terapia intensiva
Equipe de enfermagem
Saúde

RESUMEN

Este estudio evaluó factores individuales, relativos al trabajo, y organizacionales, relacionados a la adhesión a las precauciones estándar por parte de profesionales de enfermería actuantes en terapia intensiva. Estudio de corte transversal, realizado con 178 profesionales en hospital de gran porte. Datos recolectados utilizando escalas psicométricas del tipo Likert. En la Escala de Adhesión a las Precauciones Estándar se obtuvo un puntaje de 4,45 (DE=0,27), clasificado como intermedio. Existió correlación cuando se la comparó con factores individuales para la Escala de Personalidad de Riesgo ($r=-0,169$; $p=0,024$) y factores relativos al trabajo con la Escala de Obstáculos para seguir las precauciones estándar ($r=-0,359$; $p=0,000$). La adhesión a las precauciones estándar entre profesionales de enfermería resultó intermedia. Factores individuales y relativos al trabajo influyeron en la adhesión a las precauciones estándar.

DESCRIPTORIOS

Precauciones universales
Cuidados enfermeros
Grupo de enfermería
Salud laboral

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INTRODUCTION

Intensive Care Units (ICU) are closed sectors where critical patients are attended who require high complexity care. Invasive procedures are commonly performed, which favors the exposure of professional to biological hazards.

During the care of patients, all healthcare professionals must adhere to preventive measures, in order to reduce the risk of occupational exposure and also to ensure the safety of the patient⁽¹⁻²⁾.

The concern with biological hazards was intensified with the human immunodeficiency virus (HIV)/AIDS epidemic in the 1980s, with the introduction of new strategies and norms established for safety issues in the work environment⁽¹⁾.

In 1987, recommendations called Universal Precautions (UP) were created, by the Centers for Disease Control (CDC), which resulted in the publication of a manual with the purpose of minimizing the risk of transmission of HIV and hepatitis B virus (HBV), among health professionals⁽³⁾. In 1996, the UP were revised and are now called Standard Precautions (SP).

In 2007, new precautions were introduced⁽²⁾, emphasizing that preventive measures should be oriented to the function of the action being developed, considering their potential for exposure to blood and body fluids.

Although the institution provides training related to the use of personal protective equipment (PPE), the resistance toward its use is still observed among the majority of professional nurses⁽⁴⁾.

Due to the complexity of care provided in ICUs, the work demand is elevated. Because of this, the quantity of nurses has to be sufficient, because a reduced percentage of workers generates work overload or dysfunction in its actualization, hindering the quality of care for critically ill patients⁽⁵⁾.

Occupational risks are related to patient risks, which, because of several pathologies, are submitted to a high number of procedures and therapeutic interventions that can lead to the exposure of professional healthcare workers to blood, body fluids and secretions from incisions, catheters and probes⁽⁶⁾.

A previous study pointed out that the reasons for not using the PPE reported by ICU nursing professionals were: urgency, lack of time, and lack of requirement for use in certain procedures⁽⁷⁾.

Aiming to reduce the risks associated with professionals working in the ICU, the adherence to preventive measures while performing patient care is important, such as the SP. Thus, it is necessary to identify the factors that influence the adoption of preventive measures in order to increase and

direct the practice of continuing education and training of nursing staff for adherence to SP in all situations, ensuring protection for these professionals at work.

The objective of this study was to evaluate the individual factors, related both to work and organizations, related to SP adherence by nursing professionals who work in a university hospital in an inner city of São Paulo state.

METHODS

THIS WAS a transversal cohort study, conducted in the ICU of a public university hospital in São Paulo, during the period of December 2010 to June 2011. The institution was recognized as a reference center in high quality areas of research and is divided into two units containing 27 ICU beds of general adult care, 12 coronary ICU beds, and 4 neurosurgical ICU beds.

All units of adult intensive care within the institution were selected for this study, including the general, coronary and neurosurgery ICU, in which 198 nurses worked, according to a list obtained together with the Human Resources Department of the institution.

The inclusion criteria were determined to be: being a nurse, technical nurse or nursing assistant, acting directly in patient care, and working in the previously defined inpatients units. The exclusion criteria were: nursing professionals who performed exclusively administrative functions, or who left during the collection period.

Twenty (10.01%) professionals were excluded: one performed exclusively leadership activity, nine were removed from service for an indefinite period, four were no longer working in the units, three performed activities with material management, and three refused to participate in the study. So, the study population consisted of 178 professionals of the nursing staff: nurses, technicians and nursing assistants, all of them working in ICU patient care.

The data collection occurred during the period of December of 2010 to June of 2011, during every day of the week, in the morning, afternoon and night shifts, by means of individual interviews conducted by one of the researchers in the work area.

The interviews lasted 15 to 20 minutes and doubts about completing the instrument were clarified. The researcher waited for an opportune moment in which the professional had the availability to have a conversation. The interview was conducted after clarification about the research and after signing of the Terms of Free and Informed Consent.

To collect the professional and demographic data, an instrument designed for this purpose was used, containing information about gender, professional category, education,

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time in the work function, quantity of jobs, hours worked per week, and training about the SP. The form and content of this instrument were validated by experts who worked in the area.

Ten Likert-type scales, with a total of 57 items, whose response options ranged progressively 1-5, were used for the investigation of factors related to adherence. These scales were developed⁽⁸⁻⁹⁾, translated and validated in our environment⁽¹⁰⁻¹¹⁾ and grouped into individual dimensions, related to work and organizations.

The Individual Factors dimension involved items relating to the Formulary of Demographic and Professional Aspects, the Scale of Adherence to SP (13 items), a Knowledge about Occupational Transmission of HIV Scale (seven items), the Perception of Risk Scale (three items), the Personality of Risk Scale (four items), and the Efficacy of Prevention Scale (two items).

The Work Factors dimension involved the Obstacles for Following SP Scale (six items) and Workload Scale (three items).

The Organizational Factors dimension included the Safety Climate Scale (12 items), Availability of PPE Scale (two items) and Training in Prevention of Exposure to HIV Scale (four items)

The database was structured in Excel (Windows 2007). Double entry and data validation were performed to identify possible errors.

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS), version 15.0, and descriptive statistics (frequency, measures of central tendency and dispersion) were used. The correlation of the mean score of the Adherence to SP Scale was performed with other scales, using the Pearson correlation test, considering $p \leq 0.05$. The Cronbach's alpha (α) was calculated to evaluate the reliability of the scales, with an amplitude ranging from 0 to 1, in which results with values close to 1 indicate higher reliability.

The levels of SP adherence were analyzed by calculation of simple mean scores of each scale, using the classification⁽¹⁰⁾: high (mean scores greater than or equal to 4.5); intermediate (mean scores with values between from 3.5 to 4.49); and, low (mean scores with values below 3.5).

The item responses of the scales were analyzed according to the average of the obtained scores. Therefore, all scales achieved a maximum and a minimum score that ranged between 1 to 5. To facilitate the understanding of those values, the items were recoded, so that the higher the value, the greater the perceived intensity.

The project was submitted to the Committee on Ethics and Research and was approved under protocol number 10711/2010. All participants had their confidentiality and anonymity assured, according to Resolution 196/96 of the National Health Council.

RESULTS

Table 1 shows the professional and demographic data of the 178 professionals surveyed, the majority being female and belonging to the category of nursing assistant.

Table 1 – Professional and demographic characterization of nursing professionals who work in the ICU of a university hospital in São Paulo - Ribeirão Preto, SP, 2010-2011

Variables	N°	%
Professional Category		
Nurse	54	30.3
Technical Nurse	30	16.9
Nursing Assistant	94	52.8
Sex		
Feminine	141	79.2
Masculine	37	20.8
Age (years)		
20 - 29	48	27.0
30 - 39	72	40.4
40 - 49	38	21.3
50 or more	20	11.2
Time in function (years) ≤ 05		
≤ 05	53	29.8
06 - 10	59	33.1
11 - 20	42	23.6
> 21	24	13.5
Quantity of jobs		
1	117	65.7
2	59	33.1
≥ 3	02	1.1
Worked hours per week		
≤ 39	72	40.4
40 - 49	27	15.2
> 50	79	44.4
Training in the hospital		
Yes	167	93.8
No	11	6.2

Note: (n=178)

Of the total of the professionals, 141 (79.2%) were female, with ages ranging predominantly from 30 to 39 years (40.4%), and 94 (52.8%) were classified in the category of nursing assistant. Regarding the number of hours worked per week, 79 (44.4%) of the participants reported working 50 hours or more. Of the total, 167 (93.8%) reported they had received training in the hospital that occurred within the last 24 months.

The Cronbach's alpha (α) was calculated for the scales, Adherence to SP ($\alpha = .567$); the Personality of Risk, ($\alpha = 0.789$);

Obstacles to Following the SP, ($\alpha=0.752$); the Efficacy of Prevention ($\alpha=0.387$); Perception of Risk, ($\alpha=0.504$); Safety Climate ($\alpha=0.842$); Availability of Personal Protective Equipment ($\alpha=0.710$); Workload, ($\alpha=0.735$) and also the Training in Prevention of Occupational Exposure to HIV, ($\alpha=0.758$) and the Knowledge about Occupational Transmission of HIV, ($\alpha=0.919$).

To facilitate the understanding of the results, the items were described according to the scale to which they belonged, based on the clustering conducted by the previously cited authors⁽¹⁰⁻¹¹⁾, considering individual, work and organizational factors.

Considering the classification of scores in high (≥ 4.5), intermediate (3.5 to 4.49) and low (< 3.5), there was no high score obtained for any of the individual, organizational or work factors. For the individual factors (N=178),

all scales had intermediate scores: Adherence to SP (4.45), Knowledge about Occupational Transmission of HIV (4.44), Perception of Risk (4.17), the Personality of Risk (4.26), and, Efficacy of Prevention (4.35).

For the Scale of Adherence to SP (Table 2), in the item about the disposal of sharps in appropriate containers, 97.8% of professionals responded that they always performed this practice, that is, not all of the professionals discard them in the correct way. Regarding hand hygiene after removing disposable gloves, the alternative *always* corresponded to 84.3% of the responses. Another important precaution is to use goggles when there is a possibility of splashing in the eyes and mucous membranes; only 58.4% of employees responded that they always used them. For the item, recapping of used needles, the professionals who denied performing this practice reached 53.4%.

Table 2 – Distribution of nursing professionals who work in the ICU of a university hospital in São Paulo, according to response to items that compose the Adherence to SP Scale - Ribeirão Preto, SP, 2010-2011

Standard Precautions Adherence Scale Items	Always %	Many times %	Sometimes %	Rarely %	Never %
1. Discarded sharp objects in proper containers	97.8	1.7	0.6	0	0
2. Handled all the patients as if they were infected with HIV	61.2	19.7	11.2	3.4	4.5
3. Followed standard precautions (SP) with all patients regardless of diagnosis	67.4	24.2	6.7	1.7	0
4. Washed hands after removing disposable gloves	84.3	13.5	2.2	0	0
5. Used protective apron when there was a possibility of soiling clothes with blood or other secretions	78.1	17.4	3.4	1.1	0
6. Used disposable gloves when there was a possibility of contact with blood or other secretions	90.4	7.9	1.7	0	0
7. Used protective goggles when there was a possibility of splashing the eyes with blood or other secretions	58.4	27.0	10.7	3.4	0.6
8. Used disposable mask when there was possibility of splashing the mouth with blood or other secretions	75.8	15.7	6.7	1.7	0
9. Cleaned bloodshed or other secretions immediately with disinfectant	55.6	21.3	15.7	5.1	2.2
10. Carefully handled scalpels or other sharp objects	97.8	1.1	0.6	0	0.6
11. Recapping needles	4.5	6.2	17.4	18.5	53.4
12. Wore gloves to puncture the patients vein	77.0	14.6	6.2	2.2	0
13. Considered all materials in contact with patients saliva to be contaminated	86.5	8.4	4.5	0.6	0

Nota: (n=176)

The Knowledge about Occupational Transmission of HIV Scale presents situations in which the virus can be transmitted, and the professionals responded agreeing that transmission could occur in venipuncture without gloves (90.4%), accidents with perforating materials from patients with HIV (97.2%) and splatter of blood and secretions (92.1%), among others.

For the Perception of Risk Scale, composed of questions related to the risk of occupational exposure, 84.8% reported being exposed to HIV infection in their work.

With regard to the Personality of Risk Scale, there were positive responses to the items such as assuming risks

(10.7%), being exposed to hazardous situations just for the thrill (3.4%), and preferring unpredictable experiences (7.9%).

The Efficacy of Prevention Scale approaches items related to the efficiency in the use of PPE, and 75.5% agreed that the use of disposable gloves provided protection from HIV.

In work-related factors (N=178), the scores obtained were intermediate in both the Obstacles to Following the SP Scale (3.91) and in the Workload Scale (4,24). Although the Scale of Obstacles obtained an intermediate score, it showed that the professionals identified the barriers for

adherence to SP: discomfort using PPE, insufficient information, lack of time, and general beliefs of difficulties for following the SP.

The questions about the need for agility and labor demand comprised 87.6% and 91.6% of responses, respectively, for the Workload Scale. The items highlighted such situations that are frequently encountered in the execution of work. Organizational factors (N=178) had an intermediate score for Climate of Safety (3.57), Availability of PPE (4.31), and Training for Prevention of HIV exposure (3.82).

The Safety Climate Scale presented an intermediate score close to the low score, according to the classification. This was related to organizational factors that included the management's commitment to safety of the professional at work as an organization value. Thereby, it is clear that this question could interfere in the adoption of safety measures for the nursing professional who works in ICU.

In the correlation analysis (N=178), the Personality of Risk Scale ($r=-0.169$, $p=0.024$) and Obstacles to Following the SP ($r=-0.359$, $p=0.000$) presented a statistically significant correlation ($p<0.05$) with the Scale of Adherence to SP.

DISCUSSION

Of the 178 participants, there was a predominance of females, corroborating results of surveys have shown that women constitute the largest contingent of nursing workers^(4,11-12).

The professional status of nursing assistant corresponded to the majority in this study, representing 52.8% of the professionals. Other studies have shown that nursing assistants compose the major part of the staff in these units⁽¹³⁻¹⁴⁾. The nursing assistant is allowed to perform simple activities under the supervision of the nurse.

To ensure the quality of intensive care provided to critically ill patients, possession of technical qualifications is required, in a proportion of 52-56% of nurses and nursing technicians⁽¹⁵⁾. The composition of the nursing technicians comprised 16.9%. While technical education is required to work in the unit, the number of nursing assistants was higher.

The minimum age among the professionals was 20 years, with a concentration noted in the age group between 30 and 39 years. It was a relatively young population, corroborating other studies conducted in ICU^(4,12).

Regarding the amount of years worked, 33.1% of the professionals would fall within a range between 6 and 10 years in the function. In research conducted with ICU nurses, 64% were working less than 5 years in this function⁽⁷⁾.

The working day was shown to be elevated, because most of the participants responded that they worked more than 50 hours per week. The overload of the professional is a facilitating condition for the occurrence of occupational accidents⁽¹⁶⁾.

The majority of the professionals had received training in the hospital through presentations. It is noteworthy that the institution provided orientation about the use of PPE at the time of employee hire, and periodic lectures were conducted as part of the continuing education program. In research conducted in a hospital, 81% of nursing professionals reported having received training in the work institution itself⁽¹¹⁾.

Regarding individual factors, the scale that assessed the Adherence to SP presented intermediate scores, that is, the adoption of protective measures had high frequency, indicating that the professionals did not fully adhere to standard precautions as recommended. In this scale, some important preventative measures did not have proper adherence, such as the disposal of sharps, hand hygiene after removing disposable gloves, and use of protective glasses.

The disposal of sharps should occur in appropriate containers with rigid walls, and should be arranged in an appropriate location⁽¹⁻²⁾. Hand hygiene is recommended after glove removal and should be done by all participants; however the results were less than expected. A published survey cited that the hindering factors for hand hygiene reported by nursing professionals of an ICU were forgetfulness and lack of awareness of its importance⁽¹⁷⁾.

Regarding the use of protective goggles, the data were similar to other studies that found a low adherence to this PPE⁽¹⁸⁻¹⁹⁾. Despite all the orientation and training about the recommendation not to recap needles, there was still a significant part of the sample who performed this procedure. This finding corroborates the results found in the literature, seen in a study with 319 nursing professionals, in which 74% reported recapping needles at least once⁽²⁰⁾.

The Personality of Risk Scale presented a statistically significant correlation ($p\leq 0.05$) when compared with the Adherence to SP, revealing that a risk-taking personality could influence adherence to SP. Research on adherence to PPE showed that occupational exposure may be associated with individual and personal behavior, being strongly influenced by health beliefs⁽²¹⁾.

In the Efficacy of Prevention Scale, which includes aspects related to the use of PPE, a mean score of 4.35 (SD=0.65) was obtained, indicating intermediate perception in relation to this equipment, when the expected results would be a high perception. Professionals still considered effectiveness in adopting such measures.

The Perception of Risk Scale had a mean score of 4.17 (SD=0.76). To realize the risk of implementing the procedure means adopting a correct behavior, using the proposed and necessary measures for the occasion. In this study, risk perception had a positive influence on adherence to SP. Workers should recognize the risks they are exposed to; even if they are considered low in some situations, the occupational risk of HIV infection may make it high⁽⁹⁾.

The Knowledge about Occupational Transmission of HIV Scale showed a mean score of 4.44 (SD=0.80). The items

that correspond to this evaluation are related to HIV transmission while performing procedures such as dressings, venipuncture, handling sharps, among others.

For work related factors, Obstacles to Following SP scale showed a mean score of 3.91 (SD=0.76), that is, an intermediate level of influence on adherence to SP. The questions in this scale refer to difficulties in the use of PPE while performing some tasks. Thereby, one can say that these obstacles can influence adherence to SP. When compared to the Adherence to SP Scale, this scale showed a statistically significant correlation ($p \leq 0.05$), that is, the more obstacles perceived by the professionals, the greater the influence on adherence to SP.

In another investigation, the professionals who responded that they perceived few obstacles had an adherence of two times higher to SP than those who reported high levels⁽⁹⁾. Other authors have concluded in their studies that professionals with greater adherence to SP had lower perceived obstacles⁽¹¹⁾.

The Workload Scale presented a mean score of 4.24 (SD=0.60), indicating that professionals reported an intermediate workload. In addition to addressing issues related to workload, this domain includes the agility and speed with which it should be executed. Considering that it deals with ICU care, other studies have found similar results, since these patients require emergency care and high complexity units^(7,22).

For the Safety Climate Scale, the mean score was 3.57 (SD =0.65), classified as intermediate, but close to the low score of the classification. This scale is related to organizational factors, which include the commitment of the management to the professional's safety at work as a value of the organization. It is clear that this issue can interfere in the adoption of safety measures for nursing professional who works in ICU.

A greater perception of safety is followed by higher adherence to SP⁽⁸⁻⁹⁾. The organizational safety climate is the perception shared by the professionals of the value attributed to work safety. In addition, service management should promote dynamic work that permits the maintenance of a labor environment that results in the decrease of barriers encountered in professional practice, contributing to the adoption of protective measures⁽²¹⁾.

For the Availability of PPE Scale, the mean score was 4.31 (SD=0.69), in other words, although the responses were positive, there was still a lack of availability and easy accessibility of PPE in the units.

For the Training for Prevention of Occupational Exposure to HIV Scale, the mean score was 3.82 (SD=0.80), a value that indicated a deficiency in respect to the specific training about bloodstream infections and the use of PPE. The training on SP is a necessity and its utilization must be monitored by the institution.

Data were collected individually by one of the researchers with same proportion of time and attention being given to all participants, which contributed to reliability of the instruments. However, the results are limited to a single institution and cannot be generalized.

CONCLUSION

In this study, adherence to SP was influenced by individual and work-related factors. The level of adherence was intermediate among nurses, technicians and nursing assistants; in other words, it did not occur in its totality.

Several factors that can interfere in this context were identified in this study. Individual factors such as a risk-taking personality may be related to poor adherence to precautions, as well as the perception of risks, which relates to perceived occupational exposure and taking protective measures.

Work-related factors, such as perceived obstacles for following SP, can interfere with adherence; the more obstacles noticed by the professional in his work, the greater the influence that it will have in the adoption of the preventive measures.

Furthermore, the workday referred to by professionals was elevated, and can be characterized by high demands of work and agility in the execution of procedures in the units investigated. The work-related factors can compromise the adherence to SP, which increases the risk of professional occupational exposure. Therefore, a goal to be achieved is to increase the perception of risk among the professionals and to reduce obstacles for using the SP, promoting ongoing training of the nursing staff.

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