



# Compliance with standard precautions by nursing professionals in high complexity care

## *Cumprimento às precauções-padrão por profissionais de enfermagem no atendimento de alta complexidade*

### *Cumplimiento de las precauciones estándar por profesionales de enfermería en la atención de alta complejidad*

Daniela Rosa Floriano<sup>1</sup>

Luana Silva Rodrigues<sup>1</sup>

Cintia Machado Dutra<sup>1</sup>

Silmara Elaine Malaguti Toffano<sup>1</sup>

Fernanda Maria Vieira Pereira<sup>2</sup>

Suzel Regina Ribeiro Chavaglia<sup>1</sup>

1. Universidade Federal do Triângulo Mineiro.  
Uberaba, MG, Brasil.

2. Universidade Federal Fluminense. Rio de  
Janeiro, RJ, Brasil.

#### ABSTRACT

**Objective:** To evaluate the compliance with Standard Precautions by nursing professionals from high complexity units. **Methods:** Quantitative, descriptive and cross-sectional study, carried out in a Brazilian public hospital between January and March 2017. Data collection was performed through the application of an instrument with demographic and professional variables and the Brazilian version of Compliance with Standard Precautions Scale (CSPS-PB). Data were analyzed using descriptive and inferential statistics with IBM SPSS® software. **Results:** A total of 148 professionals participated. The rate of compliance with SP was 65.0%. There was a statistically significant difference only in relation to the professional category ( $p < 0.001$ ). **Conclusion and implications for practice:** Compliance with SP by nursing professionals was lower than expected and there was association of compliance with SP mean scores only for professional category. These results may contribute to direct strategies to encourage adherence to SP, improving the safety of professionals and patients.

**Keywords:** Nursing; Occupational Exposure; Universal Precautions.

#### RESUMO

**Objetivo:** Avaliar o cumprimento às Precauções-Padrão (PP) por profissionais de enfermagem de unidades de alta complexidade. **Métodos:** Estudo quantitativo, descritivo e transversal, realizado em um hospital público brasileiro, entre janeiro e março de 2017. A coleta de dados foi realizada por meio da aplicação de um instrumento, com variáveis demográficas e profissionais e a versão brasileira da *Compliance with Standard Precautions Scale* (CSPS-PB). Os dados foram analisados por meio da estatística descritiva e inferencial no software IBM SPSS®. **Resultados:** Participaram 148 profissionais de enfermagem. A taxa de cumprimento às PP foi de 65,0%. Houve diferença estatística significativa apenas com relação à categoria profissional ( $p < 0,001$ ). **Conclusão e implicações para a prática:** O cumprimento às PP pelos profissionais de enfermagem foi abaixo do esperado e houve associação dos escores médios de cumprimento às PP apenas para a categoria profissional. Esses resultados podem contribuir para direcionar estratégias de incentivo a adesão às PP, melhorando, assim, a segurança dos profissionais e do paciente.

**Palavras-chave:** Enfermagem; Exposição ocupacional; Precauções universais.

#### RESUMEN

**Objetivo:** Evaluar el cumplimiento de Precauciones Estándar (PE) por profesionales de enfermería en la atención de alta complejidad. **Métodos:** Estudio cuantitativo, descriptivo, transversal, realizado en un hospital público brasileño, entre enero y marzo de 2017. Colección de datos por medio de un instrumento, con variables demográficas y profesionales y la versión brasileña del *Compliance with Standard Precautions Scale* (CSPS-PB). Datos analizados a través de estadística descriptiva e inferencial en software IBM SPSS®. **Resultados:** Participaron 148 profesionales. Tasa de cumplimiento de PE de 65,0%. Hay una diferencia estadística significativa en relación con la categoría profesional ( $p < 0,001$ ). **Conclusiones e implicaciones para la práctica:** El cumplimiento de las normas por profesionales estuvo abajo del esperado y hubo asociación de los escores medios de cumplimiento a las PE apenas para una categoría profesional. Los resultados pueden ser útiles para direccionar estrategias de incentivo a las PE, mejorando la seguridad de profesionales y pacientes.

**Palabras clave:** Enfermería; Exposición Ocupacional; Precauciones Universales.

#### Corresponding Author:

Daniela Rosa Floriano.  
Email: danielarosa10183@hotmail.com.

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## INTRODUCTION

The Intensive Care Unit (ICU) is considered to be the most traumatic, tense and aggressive due to the dynamics, complexity and specialty of the sector's work routine and occupational risks. Among the professionals of these units, the nursing team is constantly exposed to occupational hazards, mainly the biological one.<sup>1-3</sup>

Nursing care for critically ill patients in the ICU or in the Emergency Room (ER) requires the maximum of professionals in the intense routine of care, demanding of the professional, a high degree of attention, skill, and agility in the execution of care and use of resources, with constant monitoring of patients, which contributes to the risk of accidents.<sup>1,2</sup>

With a view to reducing accidents with biological material, it is important to adhere to preventive measures, such as Standard Precautions (SP).<sup>3-5</sup> SP have been established by the Centers for Disease Control and Prevention and adopted worldwide and are intended to protect health care professionals and ensure safe patient care, preventing infections in the provision of care.<sup>4,5</sup>

Considering that behavioral factors such as decision-making not to use Personal Protective Equipment (PPE) or low perception of risk of exposure can influence compliance with SP.<sup>4-9</sup>

Considering that factors such as work hours, professional category, time of professional experience, and the need for improvements in working conditions in critical sectors, this study had the objective of evaluating compliance with SP by nursing professionals who worked in high complexity care.

## METHOD

### Type and place of study

This is a descriptive and cross-sectional study of a quantitative approach, carried out at the high complexity care units (Adult ICU, Coronary ICU, Hemodynamics, Adult and Child Emergency) of a public teaching hospital in the interior of Minas Gerais (MG), Brazil.

### Population

All 178 nursing professionals (nurses, technicians and nursing assistants) were invited to participate in the study. The list of names was made available by the Nursing Division. The inclusion criterion considered was: to act in nursing (nurse, technician and nursing assistant) and be designated to selected sectors, at the moment of data collection. Those who held administrative positions or who were retired were excluded. There were three refusals to participate; 17 professionals transferred from the sector and 10 were on leave, and the final population was composed of 148 participants.

### Data collection

Data collection was performed by the researchers through individual approaches to the participants, in the work sector and in all shifts, between January and March 2017. For this purpose, a semistructured instrument was applied, with demographic and

professional variables, built by the researchers and validated by five experts in the area as to form and content. The Brazilian version of the Compliance with Standard Precautions Scale (CSPS-PB), translated and validated for Brazil, was also used to assess compliance with SP<sup>8,9</sup>, for nursing professionals. The authors of the CSPS-PB allowed the use in this investigation.

The CSPS-PB is a 20-item Likert scale, with four response options that indicate the frequency of compliance with SP, comprising "always", "often", "rarely" or "never". The scale is multidimensional composed of five dimensions: Use of Protective Equipment (PPE) (six items); disposal of sharps (three items); waste disposal (one item); decontamination of used articles and spills (three items) and prevention of cross-infection from person to person (eight items). The SP compliance score varies from zero to 20, and the closer to 20, the better the compliance of professionals.

### Data analysis

Data analysis was performed using IBM SPSS® software, version 19. Demographic and professional variables were analyzed using descriptive statistics with central tendency (mean, median) and dispersion (standard deviation) measures.

For the analysis of compliance with SP, "never", "often" and "rarely" response options were grouped indicating noncompliance, and the response option "always" corresponded to compliance with the assessed practice. For the inverted items (two, four, six and 15), the analysis occurred inversely. Bivariate inferential statistics were used to evaluate the association of mean compliance scores to SP with sex, professional category, working time and weekly workload.

### Ethical aspects

All the ethical aspects of Resolution 466/2012 of the National Health Council were contemplated and the project was approved by the Ethics Committee in Research with Human Beings of the University (opinion No. 1,676,218/2016).

## RESULTS

A total of 148 nursing professionals participated; most of which being women (N=117/77, 7%), with median age of 38 years (Minimum = 26, Maximum = 63), nursing technicians and assistants, and acting in the Adult Emergency Room (TABLE 1).

The overall compliance score with SP was 13.0 indicating a compliance of 65.0% (N=146). In Table 2, the association between the professional variables was described.

Women (N=114) had a mean score of 12.8 (SD=2.5) and men (N=32) 12.8 (SD=2.6). There was no statistically significant difference between the genders ( $p=0.955$ ).

The nurses (N=41) presented mean compliance scores of 11.7 (SD=2.5) and nursing technicians / assistants 13.2 (SD=2.5), demonstrating that these complied with the SP more than the nurses ( $p<0.001$ ).

Regarding the working time in the institution, participants with less than ten years (N=55, SD=2.5) and with more than

**Table 1.** Nursing professionals (N=148) working in high-complexity sectors of a public teaching hospital, according to individual, sectoral and professional variables. Uberaba, MG, 2017.

Variables	n	%
<b>Professional category</b>		
Nurse	41	27.7
Nursing technician / assistant	107	72.3
<b>Age (in years)</b>		
25 – 29	17	11.5
30 – 39	66	44.6
40 – 49	43	29.1
50 or more	14	9.5
Blank	08	5.4
<b>Education</b>		
High school	56	37.8
Higher education	31	20.9
Specialization	54	36.5
Master	07	4.7
<b>Sector of Work</b>		
Adult Emergency Room	64	43.2
Children Emergency Room	14	9.5
Adult Intensive Care Unit	26	17.6
CoronaryIntensiveCare Unit	29	19.6
Hemodynamics	15	10.1
<b>Working time at the institution (in years)</b>		
≤ 05	91	61.5
06 to 10	13	8.8
11 to 15	20	13.5
≥ 16	12	8.1
Blank	12	8.1
<b>Weekly working hours</b>		
≤ 36 hours	100	67.6
≥ 37	48	32.4

ten years (N=87, SD=2.6) presented mean scores of 12.8, and there was no statistical difference between the groups ( $p=0.931$ ).

The weekly workload ranged from 24 to 96 hours; with a median of 36 hours and the working time in the institution ranged from two to 35 years, with a median of 11 years. Those who worked up to 36 hours (N=100) had mean scores of 12.9 (SD=2.6) and those who worked over 37 hours (N=46) 12.6 (SD=2.4), however, there was no statistically significant difference in SP compliance and weekly workload ( $p=0.612$ ).

The SP compliance rate according to CSPS-PB items

**Table 2.** Association of professional variables (N=148) according to mean scores of compliance with SP (N=148) of nursing professionals from high complexity sectors of a public teaching hospital. Uberaba, MG, 2017.

Variables	p
Gender	0.955
Professional Category	< 0.001
Working time in the hospital	0.931
Weekly workload	0.612

was described in Table 3. Considering that all participants who answered all CSPS-PB items (N=148), the median score was 13.0 (Minimum = 5, maximum 18), which indicates compliance with SP of 65%.

The compliance with the item “hand hygiene between contacts with patients” was 97% and “hand hygiene after removing disposable gloves”, 86%.

In the item about “disposing of sharps in self-contained containers”, 95% of the professionals responded to this practice, that is, not all professionals discard correctly. Regarding “hand hygiene after removing disposable gloves”, the alternative “always” corresponded to 86%. At the same time, only one professional (0.7%) answered “often” in the item “change gloves when changing patient”, while the rest of the team answered “all times” for this item.

As for the “use of mask, protective goggles and apron when there is possibility of splashes in the eyes and mucous membranes”, the rate was 68.2%. Regarding the “use of an apron / capote when there is a risk of exposure to blood, body fluids or any excretion of patients” compliance was of 67.6%. For the item “repacking used needles”, the rate was 72.3%.

## DISCUSSION

Participated in the research more nursing technicians and assistants than nurses. Considering that the nursing team is mostly composed of technicians and assistants (77.0%) and most of the participants, young people, which corroborates with the literature.<sup>10-13</sup>

As to the little experience in the hospital, this data is justified since it is a teaching hospital, which hired health professionals of all categories, through an open competitive examination. In this aspect, a Brazilian study pointed to an increase in accidents after the introduction of safe devices with engineering control, being one of the possibilities of justification, the absence of training to the newly admitted professionals.<sup>13</sup>

Considering that all professionals should follow the measures of SP, the compliance rate to SP was below expected (65%), that is, it did not happen in its entirety.

When analyzing the answers of each of the CSPS-PB items for some items, compliance with SP for hand hygiene, use of PPE, bath after extensive spattering and needle repacking was unsatisfactory. These data corroborate with the literature, since

**Table 3.** Average scores and rate of compliance with the SP, according to the CSPS-PB scale items (N=148), Uberaba, MG, 2017.

Items	Average score (SD)	%
1. I wash my hands between contacts with patients.	0.97 (0.1)	97.0
2. I use only water to wash my hands.	0.55 (0.4)	55.0
3. I use alcohol-based products to sanitize hands as an alternative if they are not visibly dirty.	0.29 (0.4)	29.0
4. I repack used needles after applying an injection.	0.02 (0.1)	72.3
5. I discard sharps in proper boxes.	0.04 (0.1)	95.0
6. The sharps box is discarded only when it is full.	0.1 (0.3)	11.0
7. I remove Personal Protective Equipment (PPE) at a designated location.	0.78 (0.4)	78.0
8. I shower in case of extensive splashing even if I have used PPE.	0.30 (0.4)	30.0
9. I cover my wounds or injuries with waterproof dressings prior to contact with patients.	0.69 (0.4)	69.0
10. I wear gloves when I am exposed to bodily fluids, blood or derivatives and any excretion of patients.	0.94 (0.2)	94.0
11. I change gloves between contact with patients.	0.99 (0.1)	99.0
12. I sanitize my hands immediately after removing the gloves.	0.86 (0.3)	86.0
13. I wear a surgical mask or in combination with goggles and apron whenever there is a possibility of splashing or spilling.	0.68 (0.4)	68.2
14. My mouth and nose are covered when I wear a mask.	0.90 (0.3)	90.0
15. I reuse a surgical mask or disposable PPE.	0.54 (0.5)	54.0
16. I wear an apron when I am exposed to blood, body fluids, or any patient excretion.	0.68 (0.4)	68.0
17. I dispose of material contaminated with blood, body fluids, secretions and excretions of patients in white plastic bags, regardless of the infectious state of the patient.	0.76 (0.4)	76.0
18. I decontaminate surfaces and equipment after use.	0.82 (0.3)	82.0
19. I wear gloves to decontaminate equipment that have visible grime.	0.96 (0.2)	96.0
20. I clean immediately with disinfectant (alcohol) surfaces after spilling blood or other body fluids.	0.93 (0.2)	93.0

compliance with SP was not fully answered by professionals and can be affected by factors such as individual, organizational and work-related factors.<sup>4-8</sup>

One of the concerns regarding the results presented is the hand hygiene between contacts with patients after removing the gloves, since Regulatory Standard 32 (NR-32)<sup>14</sup> states that the use of gloves does not replace the hand hygiene process, which should occur at least before and after the use of the same. Similar results were observed in a study that indicated adherence of 65.6% of the professionals to this practice, even though it was recognized as simple and important in the prevention and control of infections related to health care.<sup>10</sup>

In an exploratory study on the conformity of the care practice of maintenance of the double lumen temporary catheter for hemodialysis, hand hygiene by health professionals presented one of the worst adherence rates to the practice (83.9%). The authors also emphasize that hand hygiene and behavioral change of professionals should be priority measures in health programs and actions, as they are fundamental and impair the quality of services and patient safety.<sup>19</sup>

Hand hygiene is the most important and least costly procedure to prevent transmission of health care-related infections and should be part of all educational campaigns, strengthening both periodicity and technical concepts.<sup>14</sup>

Regarding the use of PPE, in this study it was low. Different data were reported in a survey<sup>15</sup>, in which 97.1% of respondents said they always wear disposable gloves when there is possibility of contact with blood or secretions. However, they showed poor adherence to the apron, goggles and protective mask.<sup>16</sup>

The use of disposable gloves, when there is possibility of contact with blood or other secretions, revealed that there is still negligence in complying with this measure by some professionals, and resembles unsatisfactory results obtained in other researches, not reaching 100% for the use of this PPE<sup>8</sup>. Results from a qualitative research on adherence to SP in ICU showed that the procedure glove was the most used PPE by nursing technicians and the apron was cited as the most difficult to adhere, followed by glasses, mask and ear protector. The interviewees also stated that there was no adherence of 100% of the SP measures, and even that, aware of the risks, they practiced unsafe

acts, such as needle repacking, puncture, withdrawal of access and medication administration without the use of gloves.<sup>17</sup>

Another point concerns needle repacking, which, although widely discussed by NR-32<sup>14</sup>, as an insecure and unsafe practice, it is present in the exercise of nursing professionals in this study. It is noteworthy that the hospital provides safe devices with engineering control such as needles, syringes, peripheral venous catheter and others. In a study on this problem, it was found that 60% of the participants have the habit of repacking, bending or disconnecting needles from the syringes with their hands after use.<sup>12</sup>

In a Brazilian philanthropic hospital, 77.7% of the accidents with biological materials occurred through cutaneous lesions with piercing-cutting materials, 52.7% of which were triggered during procedures and 11.1% due to improper disposal.<sup>18</sup>

In another investigation, with 66 nursing professionals, of whom 83.33% were nursing technicians, the majority (66.7%) had insufficient knowledge about SP; no nurse recognized the disposal of sharps as a measure of SP; and no professional described all the recommendations, which is alarming, considering that such conduct is fundamental to reduce exposure to accidents with biological material and provide improvements in the quality of care.<sup>19</sup>

As limitations of this study it is highlighted that the cross-sectional design and the use of a scale answered by the participants themselves in the workplace, which may not reflect in their entirety the compliance of the same with the SP.

Despite the limitations, these results contribute to prioritize the actions of training programs and permanent education. The results cannot yet be extrapolated to other populations.

## CONCLUSION

Compliance with SP by nursing professionals was lower than expected and there was an association of mean compliance scores with SP only for the professional category. These results may contribute to direct strategies to encourage adherence to SP, thus improving the safety of professionals and patients.

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## Compliance with standard precautions

Floriano DR, Rodrigues LS, Dutra CM, Toffano SEM, Pereira FMV, Chavaglia SRR

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