



Factors influencing adherence to standard precautions among nursing professionals in psychiatric hospitals*

Fatores que influenciam a adesão às precauções-padrão entre profissionais de enfermagem em hospital psiquiátrico

Factores que influncian la adhesión a las precauciones estándares entre profesionales de enfermería en hospital psiquiátrico

Thaís Helena Piai-Morais¹, Fabiana de Souza Orlandi², Rosely Moralez de Figueiredo³

* Extracted from the dissertation "Hospital Psiquiátrico: o risco biológico para a equipe de enfermagem," Post-graduate Program in Nursing, Universidade Federal de São Carlos, 2013.

¹ Master, Post-graduate Program in Nursing, Universidade Federal de São Carlos, São Carlos, SP, Brazil.

² Adjunct Professor, Department of Gerontology, Universidade Federal de São Carlos, São Carlos, SP, Brazil.

³ Associate Professor, Post-graduate Program in Nursing, Universidade Federal de São Carlos, São Carlos, SP, Brazil.

ABSTRACT

Objective: Evaluate and correlate individual, work-related and organizational factors that influence adherence to standard precautions among nursing professionals of psychiatric hospitals in São Paulo. **Method:** An exploratory cross-sectional study conducted with 35 nursing professionals, using the assessment tool for adherence to standard precautions through the Likert scale, ranging from 1 to 5. **Results:** Knowledge of the precautions received a high score (4.69); adherence received (3.86) and obstacles (3.78), while intermediaries and the scales of organizational factors received low scores (2.61). There was a strong correlation between the magnitude adherence scale and the personal protective equipment availability ($r = 0.643$; $p = 0.000$). The training scale for prevention of HIV exposure ($p = 0.007$) was statistically different between the nurses and nursing assistants. **Conclusion:** The organizational factors negatively contributed to adherence to standard precautions, indicating that psychiatric institutions lack safe working conditions, ongoing training and management actions to control infections.

DESCRIPTORS

Universal Precautions; Psychiatric Nursing; Exposure to Biological Agents; Hospitals, Psychiatric; Infection Control.

Corresponding author:

Rosely Moralez de Figueiredo
Post-graduate program in Nursing,
Universidade Federal de São Carlos
Rodovia Washington Luís, km 235 - SP-310
CEP 13565-905 - São Carlos, SP, Brazil
rosely@ufscar.br

Received: 08/14/2014
Approved: 02/20/2015

INTRODUCTION

Nursing professionals are the most numerous contingent among health professionals and provide direct care to patients, making them vulnerable to the risks of biological exposure during medical practice⁽¹⁾.

Hazardous situations of exposure to biological material, control measures related to Hospital Acquired Infections (HAIs) and adherence to standard precautions (SP) are well defined for general hospitals (clinical) and other health services⁽²⁻⁴⁾, but in the search for studies on this topic in mental health services, no research was found.

Since 1970 in Brazil, psychiatric hospitals have undergone restructuring and constant socio-political changes, with strong participation of primary care and intersectoral actions. However, treatment to people with mental disorders is still prolonged, persistent and marked by successive admissions, especially in severe cases⁽⁵⁻⁶⁾.

In 2010, there were 201 psychiatric hospitals in the country, totaling 32,735 beds. Of these, 15,933 (48.67%) belonged to small hospitals. The state of São Paulo recorded 54 hospitals with 10,780 beds available in the same year⁽⁶⁾.

A literature review on the prevalence of HIV, HBV and HCV in patients with mental disorders identified a high prevalence of these viruses, when compared with the general population. The authors also pointed out that HCV is an important pathogen found among psychiatric patients⁽⁷⁾.

While professionals focus their attention on the mental health of patients, often conducting clinical procedures involving biological fluid and sharp material, making it necessary.

The unexpected situations that arise during patient care in psychological distress intensify the risk of occupational exposure, as these can become agitated, leading to performing procedures in an improvised way with incorrect technique or without the use of suitable Personal Protective Equipment (PPE)⁽⁸⁻⁹⁾.

The SP is a set of measures to prevent infection which should be adopted by professionals in assisting all patients, regardless of suspected or confirmed infection status, and in any environment where health care is performed⁽¹⁰⁾.

Non-adherence to standard precautions is worrying as it exposes the workplace to unnecessary occupational hazards and is reflected in high incidence rates of occupational accidents by exposure to body fluids and sharp objects^(3,11).

In addition to these measures, hand hygiene (HH) before and after patient contact is considered one of the most important measures of control and prevention of Hospital Acquired Infections (HAIs). Studies have shown that a low level of conformity to HH^(2,4,12) by health professionals supports the spread of micro-organisms and makes it difficult to control infections. Therefore, to investigate the physical facilities of health ser-

vices and the individual factors of the professionals, it is necessary to understand the non-compliance of this practice⁽¹³⁾.

The only Brazilian study found about surveillance of HAIs and the structuring of a Hospital Infection Control Committee (HICC) in psychiatric hospitals shows that there are few studies on this topic in the international literature, a fact that complicates the interface between quality of care and local control of these HAIs⁽¹⁴⁾.

In general hospitals it is known that adherence to SP is below what is recommended. National^(2,4) and international⁽¹⁵⁻¹⁶⁾ studies show poor adherence to these measures among nurses. Considering the difficulty in the structure and control of HAIs in this scenario and the already recognized low adherence to SP, it is believed that psychiatric institutions provide even more worrying data than found in general hospitals.

With consideration to a study where it was shown that the factors influencing adherence should be assessed comprehensively⁽¹⁷⁾, this study was designed with the objective to evaluate and correlate the individual, work-related and organizational factors that influence adherence to SP of nursing professionals in a psychiatric hospital in the state of São Paulo.

METHOD

It is an exploratory, cross-sectional quantitative study, developed in a psychiatric hospital in the state of São Paulo, Brazil. The institution has 140 beds fully integrated for hospitalization of patients with psychiatric disorders and substance abuse which require prolonged hospitalization.

40 nursing professionals, six nurses and 34 nursing assistants were employed by the institution. All workers were invited to participate in the study, including those who were on vacation or leave. Of the 40 professionals, five refused to participate. Thus, the sample consisted of 35 participants.

Data collection took place from May to June, 2012. The Psychosocial and Organizational Factors Scale that influence adherence to standard precautions, validated in Brazil and authorized by the authors⁽¹⁷⁾ was used. This instrument has sociodemographic and professional variables, and ten psychometric Likert scales with 57 items, whose response options vary progressively from 1 (*I completely agree*) to 5 (*I completely disagree*) or 1 (*always*) to 5 (*never*).

The instrument was used by the researcher in the form of individual interviews at their workplace. The interviews lasted between 15 and 20 minutes and were held on any day of the week, during day and night shifts.

The following items were added to the instrument for sociodemographic variables: professional category and presence or absence of other employment.

The classification of scales into individual, work-related and organizational factors can be seen in Chart 1.

Chart 1 – Classification of scales into individual, work-related and organizational factors⁽¹⁷⁾ - São Paulo, SP, Brazil, 2009.

Individual Factors	Work-related Factors	Organizational Factors
Sociodemographic and professional variables. Adherence to SP scale (13 items) Knowledge of occupational HIV transmission scale (07 items) Risk perception scale (03 items) Personality risk scale (04 items) Prevention Efficacy Scale (02 items)	Obstacles for adherence to SP scale (06 items) Workload Scale (03 items)	Safety Climate Scale (12 items) Availability of PPE scale (02 items) Preventing exposure to HIV training scale (04 items)

The data were entered into Microsoft Office Excel 2007 spreadsheet program and double entered to compare values and identify possible errors. The processing and analysis of data were made by the Statistical Package for Social Sciences (SPSS) version 19.0 for Windows, using descriptive statistics (relative frequency, measures of central tendency and dispersion), the Pearson correlation test and parametric Student t-test.

All scales exhibited a minimum and maximum score, ranging from 1 to 5, with the responses analyzed using the average of the recorded scores.

The items in each range of the instrument were analyzed by calculating the mean scores of each scale item and then classified into high (≥ 4.5), intermediate (3.5 to 4.49) and low (<3.5), conforming to the study⁽¹⁷⁾.

To test the reliability of the scales and assess the internal consistency of the items, we used Cronbach's alpha coefficient, with an acceptance limit adopted for the study of 0.6⁽¹⁸⁾.

Considering the normality of the data identified by the Kolmogorov-Smirnov test, we used the Pearson correlation coefficient, adopting the magnitude of the correlations according to the following classification⁽¹⁹⁾: low (<0.3); moderate (0.3 to 0.59); strong (0.6 to 0.9) and perfect (1.0). The parametric Student t-test was used to verify the existence of statistically significant differences between groups. A significance level of 5% was adopted ($p \leq 0.05$).

The project was approved by the Research Ethics Committee (CEP) of Anhanguera under No. 1964/2011, and followed the recommendations of Resolution 466/2012 of the National Health Council.

RESULTS

The characterization of sociodemographic and professional aspects of the 35 participants can be seen in Table 1; 18 participants (51.4%) were male and 17 (48.6%) were female, with an average age of about 32 and 35, respectively.

Table 1 – Characterization of sociodemographic and nursing team professionals from a psychiatric hospital in the state of São Paulo - São Carlos, SP, Brazil, 2012.

Variables	(N ^o)	%
Age (years)		
20 H 29	14	40.00
30 H 39	15	42.00
40 H 49	03	8.00
50 or more	03	8.00
Gender		
Female	17	48.60
Male	18	51.40
Professional Category		
Nurse	06	17.10
Nursing Assistants	29	82.90
Education Level		
High School	29	82.90
Post-secondary	02	5.70
Post-graduation	04	11.40
Work Experience (years)		
0 H 3	10	28.60
4 H 6	13	37.10
7 H 9	06	17.10
10 H 11	02	5.70
12 or more	04	11.40
Work time in the institution (years)		
0 H 3	16	45.70
4 H 6	10	28.60
7 H 9	03	8.60
10 H 12	02	5.70
12 or more	04	11.40
Side jobs		
No	17	48.60
Yes	18	51.40
If yes (places) [†]		
General Hospital	07	20.00
Ambulatory Services	02	5.70
Others	09	25.70

continued...

Amount of hours worked (in a week)		
Up to 39 hours	16	45.70
40 H 49	02	5.70
50 hours or more	17	48.60
Way in which they learned about SP		
School/University	33	94.30
Lectures	00	00
Others	02	5.70
SP Training		
Yes	29	82.90
No	06	17.10
How long ago? (years)		
0 H 3	23	65.70
4 H 6	08	22.80
7 H 9	02	5.70
10 or more	02	5.70

n=35; †n=18.

Regarding the place where the professional had acquired knowledge on SP, 33 (94.30%) reported having been in school or university. As for training on SP, 29 (82.90%) professionals had been trained. In 65.70% of cases the training had occurred in the last three years, but in general

hospitals (clinical) or from other employment, as reported by the professionals.

The results of the scales have been described considering the classification of individual, work-related and organizational factors (Table 2).

Table 2 – Distribution of scale scores for individual, work-related and organizational factors for the nursing staff of a psychiatric hospital in the state of São Paulo - São Carlos, SP, Brazil, 2012.

SCALES	Average	SD	Median	Minimum	Maximum	Cronbach's Alpha
Individual Factors						
Knowledge of occupational HIV transmission	4.69	0.36	4.90	3.90	5.00	0.60
Adherence to Standard Precautions	3.86	0.45	3.80	3.00	4.80	0.63
Risk Perception	4.54	0.48	4.70	3.00	5.00	(-) 0.11
Effectiveness of Prevention	4.54	0.52	4.70	3.00	5.00	0.30
Personality Risk	3.69	0.89	3.80	1.50	5.00	0.57
Work-related Factors						
Obstacles for adherence to SP	3.78	0.77	3.80	2.00	5.00	0.68
Workload	3.71	0.72	3.70	2.30	5.00	0.55
Organizational Factors						
Safety Environment	2.90	0.87	2.80	1.30	4.30	0.87
Training for prevention of occupational HIV exposure	2.10	0.80	1.80	1.00	4.00	0.69
PPE availability	2.84	1.29	3.00	1.00	5.00	0.83

Regarding the reliability of the instrument, it was observed that the overall Cronbach's alpha coefficient obtained was 0.89 (considered satisfactory), except for the scales Risk Perception ($\alpha = -0.11$), Effectiveness of Prevention ($\alpha = 0.30$), Personality Risk (0.57) and Workload ($\alpha = 0.55$), which were not discussed in the study because they have low response reliability. It should be noted that in another study that also used this instrument, the scales of perceived risk and effectiveness of prevention had a Cronbach's alpha value of below satisfactory for what was considered in the present study ($\alpha > 0.6$)⁽³⁾. Therefore, further studies are needed on the psychometric properties of the instrument used.

With respect to classifying the average scores of the scales, intermediate scores for individual (4.26) and for work-related factors (3.70) were obtained. The organizational factors had low scores, with an average of 2.61.

As for the Knowledge scale of occupational HIV transmission, we observed that 80% of professionals fully agreed that having the eyes or mouth splattered with blood or other secretions or having blood in resected or cracked hands are forms of virus transmission. 94.30% of professionals also stated that being cut with contaminated sharp objects contributes to occupational HIV transmission.

On the scale of Adherence to SP, 82.90% of the professionals said always wash their hands after removing disposable gloves, and 97.10% said they always wear disposable gloves when there is a possibility of contact with blood or secretions. However, they expressed low compliance with aprons, goggles and protective masks.

In work-related factors, the scale of obstacles in adhering to standard precautions exhibited an average intermediate score. It was found that 82.90% of respondents disagreed that they could not get used to wearing PPG while

performing some tasks, and 85.70% of the respondents disagreed that the SP interferes in developing their work in the best way.

All scales of organizational factors had a low average score. These scales include: the availability of materials and PPG at the hospital, the opportunity to receive training and the management's commitment to professionals' safety at work, which aims at the prevention of occupational exposure (factors that can interfere with adherence to professional safety measures).

During the interviews, it was noted that the professionals had difficulty recognizing PPE, such as aprons, masks and goggles. They mentioned that it is procedure to have gloves available for use and only considered these as PPE.

Through the Pearson correlation coefficient, we identified that the variables of professional and sociodemographic aspects did not exhibit statistically significant correlation with all the scales, so these data were not discussed in the study.

We found strong magnitude of correlation between the adhesion to SP scale and the availability of PPE ($r = 0.643$; $p = 0.000$), that is, the lower the perception of obstacles to following standard precautions and the higher the climate of security and the availability of PPE, the better the adhesion to SP. There was also a strong correlation between safety climate scale and training for prevention of HIV exposure scales ($r = 0.710$; $p = 0.000$) and availability of PPE ($r = 0.756$; $p = 0.000$). This indicates that the higher the security climate in the institution, the more one recognizes the need for training and the availability of personal protective equipment.

The average scores of the training for preventing HIV exposure scales ($p = 0.007$) were statistically different between the two categories (nurse and nursing assistant). It is noteworthy that 88.60% of the professionals said the hospital did not offer specific training on blood-borne infections. This difference was significant for the category of nursing assistant, which minimally recognized the availability of PPE in the institution, negatively contributing to adherence to preventive measures.

DISCUSSION

The distribution of the study population according to gender being predominantly male proved to be different from other studies using the same scale in general hospitals^(2-3,17,20). These studies still show that professionals acquire knowledge of standard precautions in professional training courses and receive training on SPs in their own work institutions^(2-3,17), which differs from that found in this study.

The findings on the number of employment and working hours were high, as observed in other research^(2-3,9).

International studies that assessed adherence to SP for professionals working in non-hospital environments showed high scores of 4.54 in compliance with standard precautions⁽²¹⁻²²⁾. In this study, professionals reported not adopting protective measures as expected.

Regarding HH after the end of the procedures, about 80% of the participants stated they commonly do this practice, however, this result as also found in other studies^(2,4,12,20,23) is less than expected because the procedure

should be carefully followed by all professionals.

An Australian study in a children's hospital showed an increase in the adherence rate to HH after the adoption of strategies such as: leadership strategies, accessible dispensers with alcohol, education program, team monitoring, guidance on best practices and HM feedback performance⁽²⁴⁾. However, the use of dispensers with 70% alcohol should be exercised with caution in psychiatric institutions because of the risk of ingestion and suicide by patients.

Regarding the use of aprons, goggles and protective masks at times when there is possibility of blood spatter and secretions, the results were similar to those of other studies, which indicated a low adherence to using/wearing these PPE^(2,4,16,20). However, the use of disposable gloves was high, showing that this PPE is more embedded in the everyday routines of professionals.

A research conducted in eight general hospitals in Italy evaluated the knowledge, attitudes and compliance with standard precautions among emergency professionals, and showed that they had high levels of preventive measures⁽²³⁾, a result also obtained in this and in another study⁽³⁾.

Contrary to this, a study in five general hospitals in the Republic of Cyprus pointed out that only 9.1% of nurses adopt the SP as recommended⁽¹⁵⁾. In other international studies, low knowledge and professional adherence to SP were also observed^(15-16,25-27), indicating that there are still differences in participation rates between developed countries and developing ones.

The obstacles in following the SP scale exhibited intermediate levels, similar to that found by other research that used the same tool⁽²⁾.

One of the main obstacles identified by nurses for non-adherence to SP corresponds to an emergency situation, one in which the professional considers patient care first, and then their own safety⁽¹⁵⁾, situations that are also experienced by professionals in mental institutions.

A Nigerian study found that the main factors influencing non-adherence to preventive measures among professionals were: lack of PPE, carelessness, lack of informative pamphlets on the SP, low perception of risk for blood borne pathogens, lack of time, loss of the technical ability to use PPE and uncooperative patients⁽²⁷⁾.

The scales of organizational factors exhibited lower average scores. This finding is different from that found in other studies, which indicate that training, availability of PPE, supervision and safety performance feedback, and management support to security are factors that favor adherence to SP^(17,28).

The training on the SP is an essential and immediate need, but health institutions also need to provide PPE and monitor their use⁽²⁵⁾. In this study, respondents had difficulty recognizing the PPE and said they had not received in-house training on the SP.

The need for training can also be identified in a study realized in China with 1,444 nurses, which evidenced that only half of these nurses had knowledge and training on SP, and 98.20% of these nurses expressed the wish to be trained on such measures⁽¹⁶⁾.

The management of the health institution is responsible for the proper maintenance of a workplace, allowing for the reduction of obstacles and encouraging the professional to make decisions for their own protection⁽²⁹⁾. Researchers realized that professionals of upper management must be involved in the management of infection and need to acquire proper knowledge and train their employees⁽¹⁶⁾.

Psychiatric facilities often have few resources, diagnostic measures and professionals to implement the control of HAIs, which ends up being commonly ignored⁽³⁰⁾. However, controlling the infection in a mental health environment is a daunting challenge as there is a gap between the control and practices in this scenario. A Chinese study identified convergent results with different populations, implying that the practical preventive measures among small hospital nurses were not as good as in general hospitals, because they were the most basic, lacked adequate infrastructure and had no specialized staff in HAI control⁽¹⁶⁾.

Other authors have shown significant differences between the level of knowledge and professional categories. Such differences may be related to academic training and varying function performed on the team⁽¹¹⁾. Nevertheless, revealing that the higher the knowledge level of a professional category, the greater the chances for adopting precautionary measures, which in a way confirms the findings of this study in which the nursing assistant recognizes the availability of PPE less than the nurses.

Therefore, it is essential to place importance on academic and professional training, which contributes to strengthening of best practices to prevent occupational accidents and control of HAIs⁽²⁸⁾.

It is also important to note that the Brazilian and international literature on the subject in psychiatric institutions limited the comparison of results with other findings. Thus, most of the studies used to discuss the research referred to studies conducted in general hospitals and other services.

CONCLUSION

It was concluded that nursing professionals have knowledge of occupational HIV transmission and that adherence to SP was heavily influenced by individual, work-related and organizational factors.

Nursing assistants had lower levels of training and perceived availability of PPE in relation to nurses, negatively contributing to adherence to preventive measures.

The structural support provided by the institution did not favor the adoption of SP, especially in aspects related to the availability of PPE, training, safety performance feedback and management support to safety.

The authors found a need for psychiatric institutions to offer safer working conditions and ongoing training for the nursing staff, contributing to advancement in control of HAIs and adherence to SP in these environments.

It is noteworthy that the lack of national and international literature on this subject in psychiatric institutions limited the comparison with other studies in this context, which is the first research carried out in the country and the world, although it is only the reality of one hospital, thereby restricting generalizations.

The authors aim to encourage future research in other institutions and mental health services, thus contributing to the achievement of safer care for professionals and patients with psychiatric disorders.

RESUMO

Objetivo: Avaliar e correlacionar fatores individuais, relativos ao trabalho e organizacionais, que influenciam a adesão às precauções-padrão entre profissionais de enfermagem de hospital psiquiátrico do interior paulista. **Método:** Estudo exploratório, transversal, realizado com 35 profissionais de enfermagem, utilizando-se instrumento de avaliação da adesão às precauções-padrão, por meio de escalas do tipo Likert, variando de 1 a 5. **Resultados:** O conhecimento sobre as precauções obteve escore elevado (4,69); já a adesão (3,86) e os obstáculos (3,78), intermediários e as escalas dos fatores organizacionais escores baixos (2,61). Houve correlação de forte magnitude entre a escala de adesão e a disponibilidade de equipamento de proteção individual ($r=0,643$; $p=0,000$). A escala de treinamento para prevenção de exposição ao HIV ($p=0,007$) foi estatisticamente diferente entre os enfermeiros e auxiliares de enfermagem. **Conclusão:** Os fatores organizacionais colaboraram negativamente para a adesão às precauções-padrão, indicando que instituições psiquiátricas carecem de condições seguras de trabalho, capacitação permanente e ações gerenciais de controle das infecções.

DESCRITORES

Precauções Universais; Enfermagem Psiquiátrica; Exposição a Agentes Biológicos; Hospitais Psiquiátricos; Controle de Infecções.

RESUMEN

Objetivo: Evaluar y correlacionar los factores individuales, relativos al trabajo y organizativos, que influyen la adhesión a las precauciones estándares entre los profesionales de enfermería de hospital psiquiátrico del interior del Estado de São Paulo. **Método:** Estudio exploratorio, transversal, llevado a cabo con 35 profesionales de enfermería, utilizándose instrumento de evaluación de la adhesión a las precauciones estándares, mediante escalas del tipo Likert, variando de 1 a 5. **Resultados:** El conocimiento sobre las precauciones obtuvo puntaje elevado (4,69); ya la adhesión (3,86) y los obstáculos (3,78), puntajes intermedios; y las escalas de los factores organizativos, puntajes bajos (2,61). Hubo correlación de fuerte magnitud entre la escala de adhesión y la disponibilidad de equipo de protección individual ($r=0,643$; $p=0,000$). La escala de entrenamiento para la prevención de exposición al VIH ($p=0,007$) fue estadísticamente diferente entre los enfermeros y los auxiliares de enfermería. **Conclusión:** Los factores organizativos colaboraron negativamente para la adhesión a las precauciones estándares, señalando que las instituciones psiquiátricas carecen de condiciones laborales seguras, de capacitación permanente y acciones de gestión de control de las infecciones.

DESCRIPTORES

Precauciones Universales; Enfermería Psiquiátrica; Exposición a Agentes Biológicos; Hospitales Psiquiátricos; Control de Infecciones.

REFERENCES

1. Vieira M, Padilha MI, Pinheiro RDC. Analysis of accidents with organic material in health workers. *Rev Latino Am Enfermagem*. 2011;19(2):332-9.
2. Pereira FMV, Malaguti-Toffano SE, Silva AM, Canini SRMS, Gir E. Adherence to standard precautions of nurses working in intensive care at a university hospital. *Rev Esc Enferm USP [Internet]*. 2013 [cited 2013 Nov 04];47(3):686-93. Available from: http://www.scielo.br/pdf/reeusp/v47n3/en_0080-6234-reeusp-47-3-00686.pdf
3. Felix AMS, Victor E, Malagutti SET, Gir E. Individual, work-related and institutional factors associated with adherence to standard precautions. *J Infect Control*. 2013;2(2):106-11.
4. Figueiredo RM, Maroldi MAC. Home care: health professionals at risk for biological exposure. *Rev Esc Enferm USP [Internet]*. 2012 [cited 2013 Jan 13];46(1):140-5. Available from: http://www.scielo.br/pdf/reeusp/v46n1/en_v46n1a20.pdf
5. Cardoso L, Galera SAF. Psychiatric hospitalization and maintaining the treatment outside the hospital. *Rev Esc Enferm USP [Internet]*. 2011 [cited 2014 Sept 02];45(1):87-94. Available from: http://www.scielo.br/pdf/reeusp/v45n1/en_12.pdf
6. Brasil. Ministério da Saúde; Secretaria de Atenção à Saúde, Coordenação Geral de Saúde Mental, Álcool e Outras Drogas. *Saúde Mental no SUS: as novas fronteiras da Reforma Psiquiátrica. Relatório de Gestão 2007-2010*. Brasília; 2011.
7. Rosenberg SD, Drake RE, Brunette MF, Wolford GL, Marsh BJ. Hepatitis C virus and HIV co-infection in people with severe mental illness and substance use disorders. *AIDS Care*. 2005;19(3):26-33.
8. Gallas SR, Fontana RT. Biossegurança e a enfermagem nos cuidados clínicos: contribuições para a saúde do trabalhador. *Rev Bras Enferm*. 2010;63(5):786-92.
9. Carvalho MB, Felli VEA. O trabalho de enfermagem psiquiátrica e os problemas de saúde dos trabalhadores. *Rev Latino Am Enfermagem*. 2006;14(1):61-9.
10. Siegel J, Rhinehart E, Jackson M, Chiarello L; Health Care Infection Control Practices Advisory Committee. 2007 Guideline for Isolation Precautions: preventing transmission of infectious agents in healthcare settings. *Am J Infect Control*. 2007;35(10 Suppl 2):S65-164.
11. Lopes ACS, Oliveira AC, Silva JT, Paiva MHRS. Adesão às precauções padrão pela equipe do atendimento pré-hospitalar móvel de Belo Horizonte, Minas Gerais, Brasil. *Cad Saúde Pública*. 2008;24(6):1387-96.
12. Santos TCR, Roseira CE, Piai-Morais TH, Figueiredo RM. Hand hygiene in hospital environments: use of conformity indicators. *Rev Gaúcha Enferm*. 2014;35(1):70-7.
13. Takahashi I, Turale S. Evaluation of individual and facility factors that promote hand washing in aged-care facilities in Japan. *Nurs Health Sci*. 2010;12(1):127-34.
14. Assis DB. *Vigilância de infecções hospitalares em Unidades Psiquiátricas no Estado de São Paulo [dissertação]*. São Paulo: Faculdade de Saúde Pública, Universidade de São Paulo; 2006.
15. Efstathiou G, Papastavrou E, Raftopoulos V, Merkouris A. Compliance of Cypriot nurses with standard precaution to avoid exposure to pathogens. *Nurs Health Sci*. 2011;13(1):53-9.
16. Luo Y, He GP, Zhou JW, Luo Y. Factors impacting compliance with standard precautions in nursing, China. *Int J Infect Dis*. 2010;14(12):e1106-14.
17. Brevidegli MM, Cianciarullo TI. Psychosocial and organizational factors relating to adherence to standard precautions. *Rev Saúde Pública*. 2009;43(6):907-16.
18. Hair JF, Black WC, Babin BJ, Anderson RE, Tatham RL. *Análise multivariada de dados*. 6ª ed. Porto Alegre: Bookman; 2009.
19. Levin J, Fox JA, Forde DR. *Estatística para ciências humanas*. 11ª ed. São Paulo: Pearson-Prentice Hall; 2012.
20. Malaguti-Toffano SE, Santos CB, Canini SRMS, Galvão MTC, Brevidegli MM, Gir E. Adherence to standard precautions by nursing professionals in a university hospital. *Acta Paul Enferm*. 2012;25(3):401-7.
21. Harris SA, Nicolai LA. Occupational exposures in emergency medical service providers and knowledge and compliance with universal precautions. *Am J Infect Control*. 2010;38(2):86-94.
22. Gershon RR, Pogorzelska M, Qureshi KA, Sherman M. Home health care registered nurses and the risk of percutaneous injuries: a pilot study. *Am J Infect Control*. 2008; 36(3):165-72.
23. Parmeggiani C, Abbate R, Marinelli P, Angelillo IF. Healthcare workers and health care-associated infections: knowledge, attitudes, and behavior in emergency departments in Italy. *BMC Infect Dis [Internet]*. 2010 [cited 2013 Jan 23];10:35. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2848042/pdf/1471-2334-10-35.pdf>
24. Jamal A, O'Grady G, Harnett E, Dalton D, Andresen D. Improving hand hygiene in a paediatric hospital: a multimodal quality improvement approach. *BMJ Qual Saf*. 2012;21(2):171-6.
25. Timilshina N, Ansari MA, Dayal V. Risk of infection among primary health works in the Western Development region, Nepal: knowledge and compliance. *J Infect Dev Ctries*. 2011;5(1):18-22.
26. Wu CJ, Gardner G E, Chang AM. Taiwanese nursing students' knowledge, application and confidence with standard and additional precautions in infection control. *J Clin Nurs*. 2009;18(8):1105-12.

27. Adinma ED, Ezeama C, Adinma JIB, Asuzu MC. Knowledge and practice of universal precautions against blood borne pathogens amongst house officers and nurses in tertiary health institutions in southeast Nigeria. *Niger J Clin Pract.* 2009;12(4):398-402.
28. Aires S, Carvalho A, Aires E, Calado E, Aragão I, Oliveira J, et al. Avaliação dos conhecimentos e atitudes sobre precauções padrão. *Acta Med Port.* 2010;23(2):191-202.
29. Neves HCC, Souza ACS, Medeiros M, Munari DB, Ribeiro LCM, Tiplle AFV. Safety of nursing staff and determinants of adherence to personal protective equipment. *Rev Latino Am Enfermagem.* 2011;19(2):354-61.
30. Cheng VC, Wu AK, Cheung CH, et al.. Outbreak of human metapneumovirus infection in psychiatric inpatients: implications for directly observed use of alcohol hand rub in prevention of nosocomial outbreaks. *J Hosp Infect.* 2007;67(4):336-43.

Financial Support: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES). Master's scholarship grant CAPES/DS, 2012/2013.
