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QUESTIONNAIRE ON STANDARD PRECAUTION KNOWLEDGE: VALIDATION STUDY FOR BRAZILIAN NURSES USE

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ABSTRACT

Objective: to validate the Knowledge Questionnaire regarding Standard Precautions Measures for Brazilian nurses.

Method: a methodological exploratory study carried out in health institutions of two municipalities in the interior of São Paulo with 121 nurses. Data were collected through the sociodemographic questionnaire and the standard precautions knowledge questionnaire, adapted for Brazilian Portuguese, both of which were self-applicable.

Results: the questionnaire showed to be stable and concordant, with an Intraclass Correlation Coefficient of 0.91 and a satisfactory Kappa index. The validation by discriminant groups did not identify a statistically significant difference between the groups of nurses who reported receiving training or not on standard precautions measures (p=0.209).

Conclusion: the use of this questionnaire can help in the planning and implementation of educational programs aimed at patient and professional safety, focusing on health workers adherence to standard precautions measures.

DESCRIPTORS: Nursing. Universal precautions. Validation studies. Knowledge, attitudes and practices in health. Occupational risk.

QUESTIONÁRIO DE CONHECIMENTO SOBRE AS PRECAUÇÕES-PADRÃO: ESTUDO DE VALIDAÇÃO PARA UTILIZAÇÃO POR ENFERMEIROS BRASILEIROS

RESUMO

Objetivo: validar o Questionário de Conhecimento sobre as Medidas de Precaução Padrão para enfermeiros brasileiros.

Método: estudo metodológico, exploratório, realizado em instituições de saúde de dois municípios do interior de São Paulo, realizado com 121 enfermeiros. Os dados foram coletados por meio do questionário sociodemográfico e o questionário de conhecimento sobre as precauções-padrão, adaptado para o português do Brasil, ambos autoaplicáveis.

Resultados: o questionário mostrou-se estável e concordante, com Coeficiente de Correlação Intraclasse de 0,91 e índice Kappa satisfatório. A validação por grupos discriminantes não identificou diferença estatisticamente significativa entre os grupos de enfermeiros que informaram ou não ter recebido treinamento sobre medidas de precauções-padrão (p=0,209).

Conclusão: a utilização deste questionário pode auxiliar no planejamento e implementações de programas educativos que visem a segurança do paciente e do profissional, tendo como foco a adesão às medidas de precauções-padrão por trabalhadores de saúde.

DESCRITORES: Enfermagem. Precauções universais. Estudos de validação. Conhecimentos, atitudes e práticas em saúde. Risco ocupacional.

CUESTIONARIO DE CONOCIMIENTO SOBRE LAS PRECAUCIONES: ESTUDIO DE VALIDACIÓN PARA LA UTILIZACIÓN POR ENFERMEROS BRASILEÑOS

RESUMEN

Objetivo: validar el cuestionario de conocimientos sobre las medidas de precaución estándar para enfermeras brasileñas.

Método: estudio metodológico, exploratorio desarrollado en instituciones de salud en dos ciudades del interior de São Paulo, llevada a cabo con 121 enfermeras. Los datos fueron recolectados a través del cuestionario sociodemográfico y el cuestionario de conocimientos acerca de las precauciones estándar, adaptado para el portugués de Brasil, tanto autoadministrado.

Resultados: el cuestionario era estable y consistente con el coeficiente de correlación intra-clase de 0,91 y el índice Kappa satisfactorio. La validación por los grupos discriminantes no identificó diferencias estadísticamente significativas entre los grupos de enfermeras que informaron o no haber recibido capacitación sobre medidas de precauciones estándar (p=0,209).

Conclusión: el uso de este cuestionario puede ayudar en la planificación de los programas educativos y las implementaciones que se ocupan de la seguridad del paciente y profesional, con la adhesión de enfoque para las medidas de precauciones estándar para trabajadores de la salud.

DESCRIPTORES: Enfermería. Precauciones universales. Estudios de validación. Conocimientos, actitudes y prácticas de salud. Riesgo ocupacional.

INTRODUCTION

Health worker's knowledge regarding standard precautions (SP) measures is important, as studies show that adherence to these safety measures in health institutions may be related to the knowledge of professionals.[1-2] It is known that, in the context of worker health and patient safety, SPs are strongly recommended by the Centers for Disease Control and Prevention (CDC)[3] and ratified by the Brazilian Ministry of Health and should be used with the main objective of minimizing occupational exposure to Biological Material Potentially Contaminated (BMPC) and prevent Health Care Related Infections (HCAI).[4] Studies show that workers' knowledge about SP measures may be impacted by some variables such as: participation in training,[5-6] position,[7] adherence to SP,[1] age of the worker and time of professional experience,[2] as well as the professional category, provision of care to an adequate number of patients, and greater knowledge of hand hygiene.[8]

In this context, the literature shows that knowledge regarding SP measures are lower than desired. Regarding the basic concept of SP, which should be applied to all patients regardless of clinical or suspected diagnosis, literature found worldwide has verified that many professionals do not have adequate knowledge regarding this important principle, as most are informed that SP should only be applied during care practices with HIV positive patients or patients with viral hepatitis, or with a clinical diagnosis or suspicion of a potential transmissible infection.[5-9]

A study carried out in Portugal[10] revealed that 21% of the professionals are not aware of an alternative to hand washing. Regarding the use of Personal Protective Equipment (SPE), a study in Brazil revealed that only 53% of drivers working in emergency care units consider it important to adhere to procedure gloves when attending to victims.[11]

An integrative review carried out with the purpose of identifying instruments available in worldwide literature related to gauging health professionals' knowledge about SP[12] verified that no identified instrument addressed all the topics established by the CDC[3] and there was no disclosure of the construct validation in the studies, however, some studies performed internal consistency and stability verification by performing tests and retests. In view of the above and the lack of a Brazilian instrument regarding SP knowledge, an integrative search was carried out in the Medline, Lilacs, ISI - Web of Knowledge and Scopus databases between 1996 and 2011 and a knowledge questionnaire was discovered regarding the SP "Questionnaires for Knowledge with Standard Precautions".[1] The self-administered questionnaire, whose original version is in the Chinese language, had an internal consistency of 0.92 and test-retest stability of 0.86; Asks 20 possible questions with possible answers "yes", "no" or "unknown." A point is added for each positive answer, while no points are accumulated for negative answers replying with "no" and "unknown". The highest possible score is 20 points and the higher the score, the greater the individual's knowledge about SP.

The Standard Precautions Knowledge Questionnaire (QCSP) was adapted to the Portuguese language of Brazil[13] and the semantic validation showed that it was comprehensible, easy to answer and regularly reported knowledge about such

safety measures. It is known that the validity and reliability of construct gauging tools should reflect the concepts of the theory being tested so that the conclusions drawn from the empirical phase of the study are valid and promote the development of nursing theory and practice.[14]

Thus, in order to continue the QCSP validation process, the present study proposed to validate it in a sample composed of Brazilian nurses, in order to answer the following research question: - is the Standard Precautions Knowledge Questionnaire valid and can it be used for Brazilian nurses?

METHOD

A methodological study with the objective of validating a measurement instrument, carried out with a random sample of nurses working in health institutions of two municipalities in São Paulo, Brazil. The health institutions are represented by a high complexity teaching hospital in São Paulo, Brazil, and medium complexity establishments, from another municipality in São Paulo, Brazil. It should be noted that the study was approved by the Ethics and Research Committee of the University of São Paulo under protocol 1,306/2011.

The teaching hospital is considered to be large in size[15] and the medium complexity health facilities were represented by a private hospital, a care unit and a philanthropic hospital. According to the human resources sector, the total number of nurses working in this teaching hospital in 2011 was 411 and in the other medium complexity institutions there were 39 nurses.

For methodological studies which validate measurement instruments, the sample selection is recommended to be a minimum of 50 and a maximum of 100 subjects,[16] since 10 respondents per item of the instrument could represent unnecessary samples (sample size overkill). Thus, 120 nurses were randomly selected in order to compose the sample from the large hospital sample and all nurses from other health institutions were included and in 2012, 39 nurses were counted.

It was decided to exclude nurses who exclusively pursued management activities, who were undergoing training provided by the employing institution and who had less than six months of professional experience. The included nurses who agreed to participate in the study, after understanding and signing the Informed Consent Term (TCLE), were asked to complete the questionnaires in their free time, and the responsible researcher positioned a collection box to collect the questionnaires in the nurse managers office of each unit where the survey was being conducted or the researcher instructed the participants to take the completed questionnaire for collection at the subsequent shift. Data were collected from September to December 2012.

The hypothesis that convergent (positive) correlation between the total QCSP measure and participation in training by nurses was established in order to achieve the convergent construct validity. In order to test the validity of the convergent construct a Student's t-test was used to compare the knowledge among nurses who reported having participated and those who reported not having participated in training on SP measures.

Reliability was tested through stability and, for this, the Intraclass Correlation Coefficient (ICC) was calculated by comparing the scores obtained by applying the questionnaire to the test-retest. The retest was performed by means of a random selection of 30 nurses and was performed in the period of 7 to 14 days after the application of the instrument, and the value found must be as close to 1 as is possible, as recommended by the literature.[17]The Kappa index was used for the purpose of agreement analysis : if Kappa is <0.0 the agreement is poor; if it is 0.0 <Kappa <0.20 the agreement is slight; If it is 0.21 <Kappa <0.40 is fair; If it is 0.41 <Kappa <0.60 it is moderate; If 0.61 <Kappa <0.80 it is substantial and if it is 0.81 <Kappa <1.0 the agreement is almost perfect.[18]

The significance level of 0.05 was adopted for the hypothesis tests of the study. The data was processed by SPSS version 16.0, for Windows 7.0. Numerical variables are described by descriptive statistics, in which the average, median and standard deviation (SD) were calculated. The categorical variables are described or presented in frequency tables.

RESULTS

After calculating the losses and refusals, the sample consisted of 121 nurses, with a total response rate of 75.8% for the teaching hospital and 77% for other establishments. Of the 121 nurses, 91 were from the units of the teaching hospital and 30 were from other health facilities. The sociodemographic characterization of the participants is shown in table 1.

Table 1 - Distribution of nurses (n=121) according to the variables gender, age group, educational level and place of work. Hospitals and health services in the interior of São Paulo, Brazil, 2012

Variables	*f*	%
Gender		
Feminine	110	90.9
Masculine	11	9.1
Age group		
20 to 30	38	31.4
31 to 40	50	41.3
41 to 50	18	14.9
≥ 51	12	9.9
Missing data	3	2.5
Educational level		
3rd level	35	28.8
Incomplete specialization	6	5.0
Specialization	62	51.2
Incomplete Masters Degree	2	1.7
Masters Degree	8	6.6
Incomplete Doctorate Degree	6	5.0
Doctorate Degree	2	1.7
Place of professional practice		
University Hospital		
Emergency Department	32	26.4
Hospital Clinic	59	48.8
Non university establishments		
Philanthropic Municipal Hospital	16	13.2
Private Hospital	7	5.8
Emergency Clinic	7	5.8

The average knowledge obtained by QCSP was 15.24 (SD±1.54). The average value was 15 points; the maximum value obtained was 18 and the minimum value was 11 points. Table 2 represents the descriptive statistics of the values and percentages of correct answers and errors for each QCSP question.

Table 2 - Frequencies and percentages of nurses' responses (n=121) obtained by applying the knowledge instrument regarding standard precautions measures. Hospitals and health services in São Paulo, Brazil, 2012

Items	Correct	Incorrect	No answer
	f %	f %	f %
1	114 (94.2)	6 (5.0)	1 (0.8)
2	112 (92.5)	9 (7.5)	–
3	15 (12.4)	106 (87.6)	–
4	120 (99.2)	–	1 (0.8)
5	104 (86.0)	16 (13.2)	1 (0.8)
6	120 (99.2)	1 (0.8)	–
7	105 (86.8)	13 (10.8)	3 (2.4)
8	113 (93.4)	8 (6.6)	–
9	117 (96.7)	4 (3.3)	–
10	119 (98.3)	2 (1.7)	–
11	120 (99.2)	1 (0.8)	–
12	121 (100)	–	–
13	118 (97.5)	3 (2.5)	–
14	119 (98.3)	2 (1.7)	–
15	107 (88.4)	14 (11.6)	–
16	52 (43.0)	67 (55.3)	2 (1.7)
17	108 (89.3)	14 (11.4)	–
18	93 (76.8)	28 (23.2)	–
19	21 (17.3)	100 (82.7)	–
20	113 (93.4)	8 (6.6)	–

The reliability of the questionnaire assessed by stability through the ICC calculation was 0.91 and is described in table 3.

Table 3 - Reliability analysis of the adapted version of the knowledge questionnaire on standard precautions in nurses (n=28), through the stability measure (test and retest). Hospitals and health services in São Paulo, Brazil, 2012

ICC†	Confidence Interval*	
	Lower Limit	Upper Limit
0.913	0.809	0.961

* p<0.001; † Interclass coefficient correlation

Regarding the agreement, the results of the first application of the QCSP and the results obtained by the retest were placed in contingency tables. Some items of the questionnaire were considered constant, i.e. when all the answers to an item have the same value by the subjects. Thus, the Kappa coefficient is shown in table 4.

Table 4 - Kappa coefficients of the knowledge questionnaire on standard precautions applied to nurses. Hospitals and health services in São Paulo, Brazil, 2012

Standard Precautions Knowledge Questionnaire Items	Kappa	p value
1. Do you know what the standard precautions measures are?	Absent*	Absent
2. Standard precautions should only be used in patients diagnosed with infection or patients who are in the incubation period for a given infection	1,000	<0,001
3. The adherence to the standard precautions measures has as main objective to protect the health team	Absent	Absent
4. When in contact with blood or any other potentially contaminated materials, wash hands immediately	Absent	Absent
5. Hand hygiene should be performed while providing care to different patients	0,711	<0,001
6. Since gloves may prevent hand contamination, it is not necessary to wash hands after removing gloves	Absent	Absent
7. Contact with objects, materials, equipment, clothing and individuals with contaminated Personal Protective Equipment (SPE) should be avoided	0,650	<0,001
8. PPE should not be shared	Absent	Absent
9. When performing oral care procedures or other procedures that may involve contact with the patient's mucous membranes, the use of gloves is not mandatory	0,650	<0,001
10. In blood collection or venipuncture procedures, the use of gloves is required	Absent	Absent
11. In procedures where hand contact with secretion or excretion occurs, glove use is required	Absent	Absent
12. Gloves should be changed between care of different patients	Absent	Absent
13. In procedures where there is a possibility of blood, body fluid, secretions or excretions spilling, protective masks or face shields should be used	1,000	<0,001
14. In procedures where there is a possibility of blood, body fluid, secretion or excretion spilling, personal protective goggles or face shields should be worn	Absent	Absent
15. In procedures where there is a possibility of blood, body fluid, secretion or excretion spilling, a protective apron should be worn	0,837	<0,001
16. In situations where blood splatters, body fluid, secretion or excretion may occur, disposable caps and hats should be used	0,682	<0,001
17. It is forbidden to bend or recap needles. When necessary, perform the one-hand recapping method. Disposal containers should be near the handling area	0,632	<0,001
18. When providing nursing care to patients with hepatitis C or syphilis, it is only necessary to adopt the standard precautions measures	0,919	<0,001
19. When providing nursing care to patients with active tuberculosis or chickenpox, it is only necessary to adopt the standard precautions measures in addition to the droplet precautions measures	1,000	<0.001
20. When providing nursing care to patients with intestinal infections or skin infections, standard precautions should be taken in addition to contact precautions	Absent	Absent

* Absent: Kappa statistic could not be calculated in these situations due to the presence of 0 on the concordant diagonal (1.1) and (0.0).

Regarding the convergent construct validity, no statistically significant difference was found between the discriminant groups of nurses who reported having received training and nurses who did not report having received training on SP measures. The nurses who reported having participated in training obtained an average score of 15.31, while those who reported not having participated in training on SP obtained 14.67 points (p=0.209).

DISCUSSION

This study is important in view of the gap of a Brazilian instrument aimed at measuring nurses' knowledge of SP. The stability and QCSP concordance were satisfactory. However, it is suggested that future investigations test the validity, as the validity of discriminant groups did not show statistically significant differences. It is suggested that

the QCSP should be used in different populations of Brazilian nurses, in order to highlight the possibility of a relationship between SP knowledge and other variables, whose relationships can be tested through previously established hypotheses and can be considered as evidence of the validity of the questionnaire.[19] However, it is known that it is difficult to gauge subjective constructs in health, such as SP knowledge. It is also worth noting that future investigations should test the feasibility of using the questionnaire for nursing assistants and technicians, since these are the largest proportion of professionals who make up the nursing team.[20]

It is also important to consider question number 17 in the questionnaire , which deals with adherence to the use of caps and shoe covers, since the CDC did not cite them as PPEs in their last publication on the subject.[3] A recent study, carried out in an intensive care unit, determined that there was no statistically significant difference (p=0.146) in the occurrence of infection rates, mortality and hospitalization time related to the non-use of shoe covers by the health team and by visitors.[21] This evidence affects the validity of the questionnaire and encourages studies to proceed with the validation process.

Regarding stability, the literature states that before starting to use an instrument, the reproducibility of the instrument must be established. This means that when the same measurement is repeated by different observers or at different times, the results must be similar[22] so that possible changes can be truly detected in the studied sample.

Agreement between observers using the same instrument can be demonstrated when two or more observers have a high percentage of agreement on observed behavior or when a high correlation is producible through alternate forms of a test.[14] The agreement of the QCSP by analysis of the Kappa index was satisfactory. It was noticed that the items which were could be calculated by said index, substantial agreement was found for items 5, 7, 9, 16 and 17. Regarding items 2, 13, 15, 18 and 19, agreement was classified as almost perfect.[18]

Regarding the validity, it was evidenced that nurses who received training on SP did not show statistically significant difference when compared to those who did not receive. One possible explanation may be that even after training, studies have shown that SP knowledge remains less than desirable and that work-related accidents with BMPC continue to occur and workers justify the occurrence due to lack of attention, lack of technical preparation and non-adherence to PPE.[5] Nevertheless, the literature describes that there is a lack of knowledge mainly regarding the transmission of infections between patients or from the professional to the patient.[8-9]

Although not specific to SP content, other precautions have been proposed by CDC,[3] which are called transmission-based precautions, as modes of transmission vary by type of micro-organism and some infectious agents can be transmitted by more than one contagion pathway. This referenced source cites the example of microorganisms that are mainly transmitted through direct and indirect contact (such as herpes simplex virus and Staphylococcus aureus), others that are transmitted by droplets (such as influenza virus and whooping cough) and those that are transmitted by air (such as tuberculosis bacillus and varicella virus). It should be noted that for diseases transmitted by the blood route (such as hepatitis B and C virus, HIV virus) it is only necessary to follow SP.

The SP measures for microorganisms transmitted through the air-question number 19 of the questionnaire, referring to the care for tuberculosis patients - reflected in the descriptive analysis of the QCSP that 82.7% of the nurses answered the question incorrectly.

Respiratory masks classified by the American Occupational Health and Safety Agency, such as N95 filter masks, are best suited due to the size of the infectious particle of tuberculosis and should be used wherever transmission of disease via the air occurs and in all outpatient clinics regardless of other safety measures.[23] It is also important that any symptomatic respiratory patients (with symptoms of coughing, sneezing, runny nose) are transported with the use of a surgical mask in order to avoid disease transmission into the environment. It should be emphasized that the understanding of SP is an important factor for patient adherence.[4]

The findings of the study reveal the importance of permanent education in the daily scenario of health institutions. SP knowledge may relate to workers' adherence to these safety measures,[1-2] which is necessary, since high amounts of work-related accidents with BMPC have occurred among workers of several health institutions, which exposes them to the possible contamination of potentially fatal diseases, such as the HIV virus and hepatitis B and C.[24]

Therefore, unlike training, permanent health education represents an important change in the conception and educational practices, as it aims to incorporate teaching and learning into daily organi-

zational, political and social practices through problematization and teamwork. Thus, in the context of permanent health education, workers are considered reflective agents of daily professional practice and thus, (re) builders of knowledge and alternative action through meaningful learning and favoring the autonomy of the subjects.[25] The educational content should focus on both the safety of the professional and the safety of the patient, with emphases on tasks or procedures that require specific care.[25-26]

CONCLUSION

The questionnaires showed stability and agreement and are ready to be used with Brazilian nurses. It is suggested that, concomitantly with the use, hypotheses are also tested for their validation, since the validity of discriminant groups did not show statistically significant differences.

When SP measures are properly implemented, it is known that they are the main strategy in prevention of HCAI and in the protection of the worker. Thus, knowledge of these safety measures is necessary, as some studies relate knowledge to the adherence of these safety measures.

The use of the SP knowledge questionnaire can help in the planning and implementation of educational programs aimed at patient and professional safety, with the main focus being on adherence to SP by health institution workers. The importance of the use of active and up to date methodologies in the teaching-learning process incorporated in the education policies in the health institutions is also important, which must involve the protagonism of the subject and incentify safe practices.

REFERENCES

1. Luo Y, He GP, Zhou JW, Luo Y. Factors impacting compliance with standard precautions in nursing, China. Int J Infect Dis [Internet]. 2010 Dec [cited 2016 Oct 03]; 14(12):e1106-14. Available from: doi: 10.1016/j.ijid.2009.03.037
2. Li L, Chunqing L, Zunyou W, Jihui G, Manhong JIA, Zhihua Y. HIV-related avoidance and universal precaution in medical settings: opportunities to intervene. Health Serv Res. 2011; 46(2):617-31.
3. Centers for Disease Control and Prevention. Guide to infection prevent for out patient settings: Minimum expectations for safe care [Internet]. 2015 [cited 2016 Oct 03]. Available from: https://www.cdc.gov/hai/settings/outpatient/outpatient-care-guidelines.html
4. Gonçalves P, Kawagoe JY. Pacientes pela segurança do paciente. In: Agência Nacional de Vigilância Sanitária. Assistência segura: uma reflexão teórica aplicada à prática [Internet]. Série segurança do paciente e Qualidade em Serviços de Saúde. Brasília (DF): ANVISA; 2013 [cited 2016 Mar 10]. Available from: http://www20.anvisa.gov.br/segurancadopaciente/images/documentos/livros/Livro1-Assistencia_Segura.pdf
5. Silva GS, Almeida AJ, Paula VS, Villar LM. Conhecimento e utilização de medidas de precaução-padrão por profissionais de saúde. Esc Anna Nery [Internet]. 2012; 16(1):103-10. [cited 2016 Oct 10]. Avaiable from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1414-81452012000100014
6. Harris SA, Nicolai NA. Occupational exposures in emergency medical service providers and knowledge of and compliance with universal precautions. Am J Infect Control. 2010; 38(2):86-94.
7. Motamed N, Babamahmood A, Khalilian M, Peykanheirati M, Mozari M. Knowledge and practices of health care workers and medical students towards universal precaution in hospitals in Mazandaran province. East Mediterr Health J. 2006; 12(5):653-60.
8. 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. 2010; 10(35):1-9.
9. Sreedharan J, Muttappillymyalil J, Venkatramana M. Knowledge about standard precaution among university hospital nurses in the United Arab Emirates. East Mediterr Health J. 2011; 17(4):331-34.
10. Aires S, Carvalho C, Aires E, Calado E, Aragão I, Oliveira J, et al. Avaliação dos conhecimentos e atitudes sobre precauções padrão: Controlo de Infecção dos Profissionais de Saúde de um Hospital Central e Universitário Português. Acta Med Port [Internet]. 2010 [cited 2012 Oct 15]; 23(2):191-202. Available from: http://actamedicaportuguesa.com/revista/index.php/amp/article/viewFile/616/300
11. Paiva MHRS, Oliveira AC. Conhecimento e atitudes de trabalhadores de um serviço público de emergência sobre adoção de precauções padrão. Rev Bras Enferm [Internet]. 2011 [cited 2012 Nov 24]; 64(4):704-10. Available from: http://www.redalyc.org/pdf/2670/267021463012.pdf
12. Valim MD, Borges RM, Marziale MHP. Instrumentos y factores impactantes en el conocimiento de medidas de pracuación estándar entre trabajadores de la salud [internet]. Enferm Global [Internet]. 2016 [cited 2012 Dec 27]; 41(1):275-88. Available from: http://revistas.um.es/eglobal/article/view/223561/188551
13. Valim MD, Marziale, MHP. Adaptação cultural do Questionnaires for knowledge and compliance with standard precautions para o português brasileiro [internet]. Rev Gaúcha Enferm [Internet]. 2013 [cited 2013 Jan 28]; 34(4):28-36. Available from: http://www.scielo.br/pdf/rgenf/v34n4/04.pdf
14. LoBiondo-Wood G, Haber J. Confiabilidade e Validade. In: LoBiondo-Wood G, Haber J. Pesquisa em

enfermagem: métodos, avaliação crítica e utilização. Rio de Janeiro: Guanabara Koogan; 2001.

15. Ministério da Saúde (BR). Portaria nº 2.224, de 5 de dezembro de 2002: dispõe sobre o sistema de classificação hospitalar do Sistema Único de Saúde [Internet]. Diário Oficial União. 6 dez. 2002. [cited 2013 Apr 05]. Available from: http://www.husm.ufsm.br/janela/legislacoes/sus/sus/portaria-no-2224-de-5-de-dezembro-de-2002.pdf.
16. Sapnas KG, Zeller RA. Minimizing sample size when using exploratory fator analusis for measuremen. J Nurs Meas. 2002; 10(2):135-54.
17. Terwee CB, Bot SDM, Boer MR de, Windt DAWM van der, Konl DL, Dekker J. et al. Quality criteria were proposed for measurement properties of health status questionnaires. J Clinic Epidemiol. 2007; 60(1):34-42.
18. Landis J, Koch GG. The measurements of observer agreement for categorical data. Biometrics [Internet]. 1977 [cited 2013 Jun 17]; 33(1):159-79. Available from: http://www.dentalage.co.uk/wp-content/uploads/2014/09/landis_jr__koch_gg_1977_kappa_and_observer_agreement.pdf
19. Valim MD, Marziale MHP, Richart-Martínez M, Sanjuan-Quiles A. Instruments for evaluating compliance with infection control practices and factors that affect it: an integrative review. J Clin Nurs. 2013; 22(17):1-18.
20. Conselho Federal de Enfermagem (Cofen). Análise de dados dos profissionais de enfermagem existentes nos Conselhos Regionais. Relatório de pesquisa[Iinternet]. Brasília (DF): Cofen; 2011. [cited 2013 Jul 10]. Available from: http://docplayer.com.br/5913257-Analise-de-dados-dos-conselhos-regionais-para-o-projeto-de-descentralizacao-da-emissao-de-carteiras-definitivas-dos-profissionais-de-enfermagem.html
21. Ali Z, Qader A, Akthar A. To determine the effect of wearing shoe covers by medical staff and visitors on infection rates, mortality and length of stay in Intensive Care Unit [internet]. Pakistan J Med Scienc [Internet]. 2014 [cited 2013 Aug 10]; 30(2):272-5. Available from: https://www.researchgate.net/publication/261923074_To_determine_the_effect_of_wearing_shoe_covers_by_medical_staff_and_visitors_on_infection_rates_mortality_and_length_of_stay_in_Intensive_Care_Unit
22. Keskei AP, Novak M, Streiner Dl. Introduction to health measurement scales. J Psychosom Res. 2010; 68(4):319-23.
23. Radonovich LJ Jr, Cheng J, Shenal BV, Hodqson M, Bender BS. Respirator tolerance in health care workers. JAMA. 2009; 301(1):36-8.
24. Valim MD, Marziale MHP. Avaliação da exposição ocupacional a material biológico em serviços de saúde [internet]. Texto Contexto Enfermagem [Internet]. 2011 [cited 2013 Nov 25]; 20 (Esp):138-46. Available from: http://www.redalyc.org/pdf/714/71421163018.pdf
25. Ministério da Saúde (BR). Portaria nº 278, de 27 de fevereiro de 2014. Institui diretrizes para a implementação da Política de Educação Permanente em Saúde, no âmbito do Ministério da Saúde (MS) [Internet]. 27 fev 2014. [cited 2016 Oct 03]. Available from: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2014/prt0278_27_02_2014.html
26. Centers for Disease Control and Prevention (CDC). National Center for Emerging and Zoonotic Infectious Diseases. Infection Prevention Checklist for Outpatient Settings: Minimum Expectations for Safe Care [Internet]. 2011 [cited 2014 Fev 14]. Available from: http://www.cdc.gov/HAI/settings/outpatient/checklist/outpatient-care-checklist.html

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