



Journal of Nursing

Revista de Enfermagem

UFPE On Line

ISSN: 1981-8963

ORIGINAL ARTICLE

KNOWLEDGE OF NURSING PROFESSIONALS IN RELATION TO MEASURES OF PREVENTION OF INFECTIONS

CONHECIMENTO DOS PROFISSIONAIS DE ENFERMAGEM EM RELAÇÃO ÀS MEDIDAS DE PREVENÇÃO DAS INFECÇÕES

LOS CONOCIMIENTOS DE LOS PROFESIONALES DE ENFERMERÍA EN RELACIÓN CON LAS MEDIDAS DE PREVENCIÓN DE INFECCIONES

André Luiz Silva Alvim¹, Andrea Gazzinelli²

ABSTRACT

Objective: to evaluate the knowledge of nursing professionals in relation to measures of prevention of infections related to health care. **Method:** a field study, descriptive, of a quantitative approach, developed in a hospital in Belo Horizonte/BH with 84 nursing professionals. A questionnaire was applied to evaluative measures of precautions (standard, contact, droplets and aerosol) according to recommendations of the Centers for Disease Control and Prevention (CDC). For data analysis the Chi-square test was used by the Epi Info statistical program version 7. **Results:** there was highlighted the relationship between age (30 years old or over) and the unsatisfactory knowledge (OR: 4.33, p=0.02). **Conclusion:** the unsatisfactory knowledge in this age group may be related to excessive confidence and professional outdated to current contents published in the literature. **Descriptors:** Cross Infection; Infection Control; Knowledge.

RESUMO

Objetivo: avaliar o conhecimento dos profissionais de enfermagem em relação às medidas de prevenção das infecções relacionadas à assistência à saúde. **Método:** estudo de campo, descritivo, de abordagem quantitativa, desenvolvido em um hospital de Belo Horizonte/BH com 84 profissionais de enfermagem. Foi aplicado um questionário avaliativo das medidas de precauções (padrão, contato, gotículas e aerossol) conforme recomendações do *Center for Disease Control and Prevention* (CDC). Para análise dos dados utilizou-se o teste Qui-quadrado pelo programa estatístico Epi Info versão 7. **Resultados:** destacaram-se a relação entre a idade (30 anos ou mais) e o conhecimento insatisfatório (OR: 4,33; p=0,02). **Conclusão:** o conhecimento insatisfatório nesta faixa etária pode estar relacionado ao excesso de autoconfiança e desatualização profissional aos conteúdos atuais publicados na literatura. **Descritores:** Infecção Hospitalar; Controle de Infecções; Conhecimento.

RESUMEN

Objetivo: evaluar el conocimiento de los profesionales de enfermería en relación con las medidas de prevención de infecciones relacionadas con la atención de la salud. **Método:** un estudio de campo, descriptivo, del enfoque cuantitativo, desarrollado en un hospital de Belo Horizonte/BH con 84 profesionales de enfermería. Se aplicó un cuestionario de evaluación de medidas de precaución (estándar, el contacto, gotas y aerosoles) de acuerdo con las recomendaciones de los Centros para el Control y Prevención de Enfermedades (CDC). Para el análisis de datos se utilizó la prueba Chi-cuadrado por el programa estadístico Epi Info versión 7. **Resultados:** destacó la relación entre la edad (30 años o más) y el conocimiento insatisfactorio (OR: 4,33, p=0,02). **Conclusión:** el conocimiento insatisfactorio en este grupo de edad puede estar relacionado con el exceso de confianza y profesional actual desactualización contenidos publicados en la literatura. **Descriptores:** Infección Hospitalaria; Control de Infecciones; Conocimiento.

¹Nurse, Masters' Student, Federal University of Minas Gerais/UFMG. Belo Horizonte (MG), Brazil. Email: andrevolts@hotmail.com; ²Nurse, Phd Professor, Federal University of Minas Gerais/UFMG. Belo Horizonte (MG), Brazil. Email: andreag@ufmg.br

INTRODUCTION

To reduce the risk of transmission of microorganisms through cross-contamination between environments, patients and staff in hospitals, there are precautionary measures that should be adopted in health care of the patient.^{1,2} These measures are classified as standard precautions, contact precautions, precautions for droplet and airborne infection.^{3,4}

Standard precautions should be taken to all patients, in order to minimize the risk of contamination through hand hygiene, use of mask, goggles, aprons, gloves and proper disposal of sharps waste, hoppers up¹⁻⁴ the contact precautions to prevent the spread of transmissible infectious agents of the colonized patient or infected by multi-resistant microorganisms of epidemiological importance. Respiratory preventive measures include precautions to droplets generated by coughing, sneezing and talking, whose pathogen does not reach distances greater than one meter. Finally, the airborne infection are used in suspected or confirmed infectious agents high transmissibility whose particles reach long distances and remain suspended in the air.⁴

The prevalence of health care associated infections (HAIs) in developed countries is of 7.6%, lower than the rate of developing countries (15.5%). It is estimated that in the United States, each year, there are about 1.7 million IRAS with total enrollment of 98,987 deaths. In Europe, according to the World Health Organization (WHO), the incidence reaches about 4 million hospitalized patients / year. In Brazil, data shows that between 5 and 15% of hospitalized patients and 25 and 35% of patients admitted to intensive care units (ICUs) acquire an infection related to assistance.⁵⁻⁸

The fact that health professionals do not properly adopt precaution measures in care practice to isolated patient, impacts negatively on the rise of colonization and cross-infection related to care.⁵ Besides described context, the authors of this research, working in the Control Service Hospital Infection (SCIH) experience, in everyday life, a number of difficulties, in particular the nursing staff. These difficulties are mainly linked to care related to specific precautions for patients colonized or infected by bacteria of epidemiological importance as an example, *Clostridium difficile* and other Community diseases of high transmissibility, such as pulmonary tuberculosis and bacterial meningitis.^{4-5,9-12} Then comes the question

guiding this research: Do nursing professionals, linked directly to health care, have knowledge of the precautionary measures to prevent and control HAIs?

Knowledge of health professionals about preventive measures related to IRAS is considered unsatisfactory even with the efforts of institutional leaders to keep them updated through regular training. It also includes other factors hindering linked to problematization described as the low professional experience associated with lack of time and forgetfulness of tubes, directly influencing inappropriate behavioral attitudes in the workplace.¹⁰⁻⁴

Thus, it is expected that this study will provide information that will support more effective behaviors performed in the practice of care, corroborating the current prevention guidelines and hospital infection control, and provide data to draw the attention of health managers to draw effective action about issues related to the proposed theme.

OBJECTIVE

- To evaluate the knowledge of nursing professionals in relation to prevention of infections related to health care.

METHOD

This is a field study, descriptive, quantitative, developed in a private general hospital in Belo Horizonte which has 30 ICU beds, 150 beds in hospital, and 12 operating rooms serving various specialties such as orthopedics, neurosurgery, cardiovascular surgery and general surgery.

In the universe of 200 professionals there were selected 84 subjects of the nursing staff working in the Inpatient Units (IU) and Intensive Care Units (ICU). The sample size was established by an estimate for the expected proportion event ($p = 0.50$), a margin of error of 10% of this estimate ($E0 = 0.10$) and the calculation of 95% confidence interval.¹⁵ The inclusion criteria used in the study were nurses or nursing technicians directly related to patient care working in the UI or ICU. All volunteers signed the Informed Consent.¹⁶

For data collection there was a questionnaire with demographic information (age, gender, race, marital status, education, profession), economic (family income) and related professional profile (business sector, shift and number of hours worked) of the participants. Then the "evaluative questionnaire of precaution measures for prevention and infection control" was applied;

Alvim ALS, Gazzinelli A.

Knowledge of nursing professionals in relation...

containing 10 questions related to the knowledge of nursing professionals about the measures precautions adopted in the study of hospital according to the recommendations of the Centers for Disease Control and Prevention.⁴ This questionnaire was constructed based on the literature and evaluated by two infectious disease specialists, experts in the field and active for over 20 years in SCIH. The aspects covered in this data collection instrument were prepared according to the reality of the institution and the profile of the patients seen at the hospital.

Data collection was conducted in November and December 2015 in the morning and evening, contemplating the day and night shifts in their respective lines of work of nursing professionals. The correction of the questionnaire was conducted by researcher

considering a score greater than or equal to 70% as satisfactory and less than 70% as unsatisfactory.

Questionnaire data were entered in Microsoft Excel 2010 program. For the database for analysis of qualitative variables we used the frequency and confidence interval. For bivariate analysis of data we used the chi-square distribution (odds ratio, 95% CI and P value) by the statistical program Epi Info version 7. The study had the project approved by the Research Ethics Committee (CEP) of the hospital studied (CAAE: 46953815.2.0000.5126).

RESULTS

Table 1 shows that most participants were aged 30 years old (56%), female (76.2%), Tan color (48.8%), singles (51.2%) and with household income above R\$ 1500.00 (64.3%).

Table 1. Socio-demographic profile of the research participants. Belo Horizonte (BH), Brazil, 2016.

Variables	n	%
Age		
Up to 30	37	44,0
30 years old or older	47	56,0
Gender		
Female	64	76,2
Male	20	23,8
Race		
White	25	29,8
Black	11	13,1
Dark	41	48,8
Other	7	8,4
Marital Status		
Single	43	51,2
Married	32	38,1
Separated/Divorced	9	10,8
Family Income		
Up to R\$1.500,00	30	35,7
R\$1.501,00 or over	54	64,3

In relation to the professional profile of the nursing staff (table 2), the majority (63.1%) had technical training, played mainly in inpatient units (71.4%) and worked in the

daytime shift (66.7%). The nurses' 31, little more than half (53.6%) had at least one graduation.

Table 2. Professional profile of the research participants. Belo Horizonte (BH), Brazil, 2016.

Variables	n	%
Training		
Nurse	31	36,9
Nursing Technician	53	63,1
Sector		
Inpatient Unit	60	71,4
ICU	24	28,6
Shift		
Daytime	56	66,7
Night time	28	33,3
Working Hours		
Up to 8	79	94,0
8 hours or over	5	5,9
Graduation		
Yes	15	53,6
No	13	46,4

Alvim ALS, Gazzinelli A.

Knowledge of nursing professionals in relation...

Regarding the results of the questionnaire administered to nursing professionals stands out satisfactory knowledge ($\geq 70\%$) in the aspects surrounding the microorganisms of transmission mechanisms in the hospital environment, varying the frequency of hits between 77-94% (95% CI = 67-98). Knowledge was also satisfactory compared to standard precautions, contact precautions and caution for aerosols, varying arrangements between 73-99% (95% CI 62-100). However, it is emphasized that the greatest difficulty of

professionals was linked to respiratory preventive measures whose transmission occurs by droplets. Note that in this case the nursing knowledge was poor ($<70\%$), ranging from 50-54% of the total hits (95% CI 42-61).

Table 3 shows the relative age (30 years old or over) and the unsatisfactory knowledge (OR: 4.33, $p = 0.02$). The other variables represented no statistically significant difference in relation to the response variable ($p > 0.05$).

Table 3. Analysis of qualitative variables associated with the outcome. Belo Horizonte (BH), Brazil, 2016.

Variables	Knowledge		OR	IC95%	P value
	Unsatisfactory	Satisfactory			
Age					
Over 30	13	34	4,33	1,13-16,5	0,02
Up to 30	3	34			
Gender					
Female	13	51	1,01	0,29-3,57	0,62
Male	4	16			
Family Income					
Up to R\$1.500,00	8	22	1,81	0,61-5,35	0,21
R\$1.501,00 or over	9	45			
Training					
Nurse	6	25	0,91	0,30-2,78	0,62
Nursing Technician	11	42			
Graduation					
Yes	2	13	1,95	0,27-13,9	0,43
No	3	10			
Sector					
IU	11	49	0,67	0,21-2,08	0,34
ICU	6	18			
Shift					
Daytime	10	46	0,65	0,21-1,94	0,31
Night time	7	21			
Working Hours					
Up to 8	1	4	1,01	0,10-9,72	0,69
Over 8	16	63			

Note: OR - ODDS ratio

DISCUSSION

In this study, knowledge of standard precautions and contact diverged from a study conducted in Western Asia, which found the low understanding (43%) of nursing professionals.¹⁷ It is known that these specific measures contribute to the prevention and control of dissemination of microorganisms between environments, professionals and / or patients in health services.^{4;18-20}

Regarding the precautionary measures to aerosols, we obtained good knowledge of the subjects of this study. It is noteworthy that most of the published research does not assess the knowledge of the nursing team in relation to this specific case.^{10,17,20,21} In the case of Community diseases of high transmissibility as an example, pulmonary tuberculosis, it is essential that professionals know and adopt in practice this measure to control the spread of aerosol particles that reach long distances and remain suspended in the air.⁴

In assessing the precautionary measures to droplets stood out poor knowledge among most participants, corroborating national study that found similar data in a private general hospital.²² In this case, it is essential that professionals know the particularities of this measure and enforce it for the assistance offered to the patient. It is known that the precaution droplet is indicated in suspected cases and / or confirmed infectious diseases transmitted by heavy particles generated by coughing, sneezing and talking.⁴

Age Association (30 years old or over) and the unsatisfactory knowledge can be linked to appropriate vast experience confidence and downgrading the current contents published in the literature. Recently graduated nursing professionals tend to follow more rules and institutional protocols when compared to those who have extensive experience and tend not to recycle the knowledge.²³

The poor knowledge can be linked to the lack of frequent and specific training offered

Alvim ALS, Gazzinelli A.

by labor institutions. There is a consensus among many authors about the importance of working with the continuing education of nursing staff to succeed in the aspects that surround the ways to prevent and control HAIs.^{10,14,17;21-4}

CONCLUSION

The professionals of this study of 30 years old or over possessed little knowledge when compared to the group with lower age, and may be related to overconfidence and downgrading the current contents published in the literature. One could say that these subjects require continuous education addressing aspects of transmission, prevention and primary indications related to respiratory preventive measures whose transmission occurs by droplets and can contribute to reducing morbidity and mortality by cross-transmission of infectious diseases and reduction the healthcare costs of treatment to unexpected injuries.

REFERENCES

1. Tacconelli E, Cataldo MA, Dancer SJ, Angelis G, Falcone M, Frank U et al. Diretrizes da ESCMID para o gerenciamento de medidas de controle de infecção a fim de reduzir a transmissão de bactérias Gram-negativas multidroga-resistentes em pacientes hospitalizados. J Infection Control [Internet]. 2014 [cited 2015 Jan 2];3(3):50-89. Available from: <http://jic.abih.net.br/index.php/jic/article/view/99/pdf>
2. Maziero VG, Vannuchi MTO, Vituri DW, Haddad MCL, Tada CN. Precauções universais em isolamentos de pacientes em hospital universitário. Acta Paul Enferm [Internet]. 2012 [cited 2015 Jan 15];25(2):115-20. Available from: http://www.scielo.br/pdf/ape/v25nspe2/pt_18.pdf
3. Brasil. Ministério da Saúde. Protocolo de tratamento de Influenza [Internet]. Brasília: Ministério da Saúde; 2015. Available from: <http://portalsaude.saude.gov.br/images/pdf/2015/dezembro/17/protocolo-influenza2015-16dez15-isbn.pdf>
4. CDC. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings [Internet]. Atlanta: Center for Disease Control and Prevention; 2007. Available from: www.cdc.gov/hicpac/pdf/isolation/Isolation2007.pdf
5. Pérez P, Usagre MH, Cavanillas AB, Humada MSA, Camacho BB, Vázquez M. Higiene de las manos: conocimientos de los

Knowledge of nursing professionals in relation...

- profesionales y áreas de mejora. Cad Saúde Pública [Internet]. 2015 Jan [cited 2016 Feb 3];31(1):149-60. Available from: <http://www.scielo.org/pdf/csp/v31n1/0102-311X-csp-31-01-00149.pdf>
6. WHO. World Health Organization. Report on the Burden of Endemic Health Care-Associated Infection Worldwide. World Health Organization [Internet]. 2011 [cited 2016 Feb 10]. Available from: http://apps.who.int/iris/bitstream/10665/80135/1/9789241501507_eng.pdf
 7. Kleven RM et al. Estimating Health Care-Associated Infections and Deaths in U.S. Hospitals, 2002. Public Health Rep [Internet]. 2007 Mar-Apr [cited 2016 Jan 10];122(2):160-66. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/17357358>
 8. Moura MEB, Campelo SMA, Brito FCP, Batista OMA, Araújo TME, Oliveira ADS. Infecção hospitalar: estudo de prevalência em um hospital público de ensino. Rev Bras Enferm [Internet]. 2007 Aug [cited 2016 Jan 17];60(4):416-21. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672007000400011&lng=en
 9. Ferreira J, Bouzada MCF, Jesus LA, Cortes MCW, Armond GA, Clemente WT. Evaluation of national health-care related infection criteria for epidemiological surveillance in neonatology. J Pediatr [Internet]. 2014 Aug [cited 2016 Jan 4];90(4):389-95. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0021-75572014000400389&lng=en
 10. 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 Mar [cited 2016 May 17];16(1):103-110. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1414-81452012000100014&lng=en
 11. Oliveira AC, Paula AO, Iquiapaza RA, Lacerda ACS. Infecções relacionadas à assistência em saúde e gravidade clínica em uma unidade de terapia intensiva. Rev Gaúcha Enferm [Internet]. 2012 Sep [cited 2016 Feb 1];33(3):89-96. Available from: <http://www.scielo.br/pdf/rngen/v33n3/12.pdf>
 12. CDC. Scott, RD. The Direct Medical costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention [Internet]. Atlanta: Center for Disease Control and Prevention; 2009. Available from: www.cdc.gov/hai/pdfs/hai/scott_costpaper.pdf
 13. Melo DS, Souza ACS, Tipple AFV, Neves Zilah CP, Pereira MS. Compreensão sobre

Alvim ALS, Gazzinelli A.

Knowledge of nursing professionals in relation...

precauções padrão pelos enfermeiros de um hospital público de Goiânia-GO. *Rev Latino-Am. Enfermagem* [Internet]. 2006 Oct [cited 2016 Aug 24];14(5):720-727. Available from: http://www.scielo.br/scielo.php?script=sci_arctext&pid=S0104-11692006000500013&lng=en

14. Sax H, Perneger T, Hugonnet S, Herrault P, Chraïti MN, Pittet D. Knowledge of standard and isolation precautions in a large teaching hospital. *Infect Control Hosp Epidemiol* [Internet]. 2005 [cited 2016 Feb 6];26(3):298-304. Available from: www.ncbi.nlm.nih.gov/pubmed/15796284

15. Hulley SB, Cummings SR, Browner WS, Grady D, Hearst N, Newman TB. *Delineando a pesquisa clínica: uma abordagem epidemiológica*. Artmed Editora. Porto Alegre. 2006.

16. Brasil. Ministério da Saúde. Conselho Nacional de Saúde. Resolução n. 466, de 12 de dezembro de 2012 [Internet]. Brasília: Ministério da Saúde; 2012 [cited 2016 Feb 6]. Available from: http://bvsms.saude.gov.br/bvs/saudelegis/cns/2013/res0466_12_12_2012.html

17. Sarani H, Balouchi A, Masinaeinezhad N, Ebrahimitabas E. Knowledge, Attitude and Practice of Nurses about Standard Precautions for Hospital-Acquired Infection in Teaching Hospitals Affiliated to Zabol University of Medical Sciences (2014). *Glob J Health Sci* [Internet]. 2015 [cited 2016 Jan 20];8(3):193-8. Available from: www.ncbi.nlm.nih.gov/pubmed/26493432

18. MEHTA Y et al. Guidelines for prevention of hospital acquired infections. *Indian J Crit Care Med* [Internet]. 2014 [cited 2016 Jan 20];18(3):149-63. Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3963198/?tool=pubmed>

19. ANVISA. Agência Nacional de Vigilância Sanitária. *Medidas de Prevenção de Infecção Relacionada à Assistência à Saúde* [Internet]. Brasília: ANVISA; 2013. Available from: <http://www20.anvisa.gov.br/segurancadopaciente/images/documentos/livros/Livro4-MedidasPrevencaoIRASaude.pdf>

20. Oliveira AC, Damasceno QS, Ribeiro SMCP. Infecções relacionadas à assistência em saúde: desafios para a prevenção e controle. *REME - Rev Min Enferm* [Internet]. 2009 [cited 2016 Feb 21];13(3):445-50. Available from: <http://www.reme.org.br/artigo/detalhes/211>

21. Ikeda M, Hori S, Nevill MH, Aminaka M, Sumomozawa Y. Improving the Compliance and Knowledge of Standard Precautions in a Large University Hospital. *American Journal of Infection Control* [Internet]. 2007 June [cited 2016 Jan 4];35(5):[about 5 p.]. Available from:

[http://www.ajicjournal.org/article/S0196-6553\(07\)00266-0/abstract](http://www.ajicjournal.org/article/S0196-6553(07)00266-0/abstract)

22. Alves ANF, Duarte CA, Paula MP, Moraes RE, Coutinho RMC. Conhecimento da enfermagem na prevenção de infecção hospitalar. *Rev Inst Ciênc Saúde* [Internet]. 2007 [cited 2015 Dec 30];25(4):365-72. Available from: http://www.unip.br/comunicacao/publicacoes/ics/edicoes/2007/04_out_nov/V25_N4_2007_p365-372.pdf

23. Anderson N, Johnson D, Wendt L. Use of a Novel Teaching Method to Increase Knowledge and Adherence to Isolation Procedures. *Medsurg Nurs* [Internet]. 2015 May [cited 2015 Dec 29];24(3):159-64. Available from: www.ncbi.nlm.nih.gov/pubmed/26285370

24. Manzo B, Corrêa A, Rocha L, Barros S, Bueno M, Veloso M. Utilização do bundle de acesso venoso central em unidades neonatal e pediátrica: revisão integrativa. *J Nurs UFPE on line* [Internet]. 2015 Apr [cited 2016 Jan 1];9(4):8111-22. Available from: <http://www.revista.ufpe.br/revistaenfermagem/index.php/revista/article/view/6396>

Submission: 2016/08/24

Accepted: 2016/10/11

Publishing: 2017/01/01

Corresponding Address

Andrea Gazzinelli
Universidade Federal de Minas Gerais
Escola de Enfermagem
Av. Alfredo Balena 190
CEP: 30130-100 – Belo Horizonte (MG), Brazil