Journal of Nursing
Revista de Enfermagem
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

HEALTH PROFESSIONALS' ADHESION TO HAND HYGIENE

ADERÊNCIA DE PROFISSIONAIS DE SAÚDE À HIGIENIZAÇÃO DAS MÃOS

ADHERENCIA DE LOS PROFESIONALES DE SALUD PARA LA HIGIENE DE LAS MANOS

Eliana Ofelia LLapa-Rodríguez[1], Júlian Katrin Albuquerque de Oliveira[2], Max Oliveria Menezes[3], Luciana de Santana Lôbo Silva[4], Daniel Marques de Almeida[5], David Lopes Neto[6]

ABSTRACT

Objective: to analyze the adhesion to hand hygiene of health professionals who provide cancer care and its correlation with the variables professional category, indication, type of conduct and used input. ***Method:*** quantitative, cross-sectional study, with a sample of 1397 observation opportunities of the five moments of hand hygiene at a cancer hospital. Data were collected by means of a form and analyzed using Graph Pad Prism 5.0. ***Results:*** the overall adherence rate was 29%, classified as undesirable or tolerable, with higher rates for nurses. There were no significant differences between adhesion and category (p<0.0001), as well as in the five moments (p<0.0001). The moment "after exposure to bodily fluids" showed higher rates, predominating the use of water/soap. ***Conclusion:*** adherence to hand hygiene was classified according to Carter's index as tolerable, outside the recommendations advocated by the World Health Organization. ***Descritores*:** Hand Hygiene; Patient Care Team; Patient Safety; Nursing Team; Oncology Service, Hospital; Quality Control.

RESUMO

***Objetivo*:** analisar a aderência à higienização das mãos de profissionais de saúde que prestam assistência oncológica e sua correlação com as variáveis categoria profissional, indicação, tipo de conduta e insumo utilizado. ***Método*:** estudo quantitativo, de corte transversal, com amostra de 1397 oportunidades de observação dos cinco momentos de higienização das mãos em um hospital de oncologia. Os dados foram coletados por meio de um formulário e analisados pelo *Graph Pad Prism* 5.0. ***Resultados*:** a taxa de aderência global foi de 29%, classificada como indesejavel ou sofrível, com maior taxa para os enfermeiros. Houve significância entre a aderência e categoria (p<0,0001), bem como nos cinco momentos (p<0.0001). Observou-se maior taxa no momento "após exposição a fluidos corpóreos", predominando o uso da água/sabão. ***Conclusão*:** a aderência à higienização das mãos foi classificada segundo o índice de Carter como sofrível, encontrando-se fora das recomendações preconizadas pela Organização Mundial de Saúde. ***Descritores*:** Higiene das Mãos; Equipe de Assistência ao Paciente; Segurança do Paciente; Equipe de enfermagem; Serviço Hospitalar de Oncologia; Controle de Qualidade.

RESUMEN

Objetivo: analizar la adherencia a la higiene de las manos de los profesionales de salud que proporcionan cuidados del cáncer y su correlación con las variables de la categoría profesional, indicación, tipo de conducta y de entrada utilizada. ***Método:*** estudio cuantitativo de corte transversal, con una muestra de 1397 oportunidades para la observación de los cinco momentos de la higiene de las manos en un hospital de oncología. Los datos fueron recolectados por medio de un formulario, y analizados mediante Graph PAD Prism 5.0. ***Resultados:*** la tasa global de cumplimiento fue del 29%, la cual fue clasificada como indesejavel u tolerable, con tasas más altas para los enfermeros. No hubo diferencias significativas entre la adherencia y la categoría (p<0,0001), así como en los cinco momentos (p<0,0001). Se observó una mayor tasa en el momento "después de la exposición a fluidos corporales", predominando el uso de agua/jabón. ***Conclusión:*** la adherencia a la higiene de las manos se clasifica según el índice de Carter como tolerable, encontrándose fuera de las recomendaciones recomendadas por la Organización Mundial de la salud.***Descritores*:** La Higiene de Manos; Equipo De Atención Al Paciente; Seguridad del Paciente; Grupo de Enfermeria; Servicio de Oncología En Hospital; Control de Calidad.

[1]RN, PhD (Postdoc), Federal University of Sergipe/FUFES, Aracaju (SE), Brazil. E-mail: elianaofelia@gmail.com ORCID iD: http://orcid.org/0000-0002-2117-6051 [2]RN,Master, University of Tiradentes/UNIT. Aracaju (SE), Brazil. E-mail: julian.nespih@gmail.com ORCID iD: http://orcid.org/0000-0002-1041-7964; [3]Nursing Especialist, University of Tiradentes/UNIT, Aracaju (SE), Brazil. E-mail: maxoliver19@hotmail.com ORCID iD: http://lattes.cnpq.br/5850995998660034; [4]Nursing Especialist, Estacio Faculty of Sergipe/ FASE. Aracaju (SE), Brazil. E-mail: lucys_lobo@yahoo.com.br ORCID iD: http://orcid.org/0000-0002-8424-1551; [5]RN, Federal University of Sergipe/UFS, Aracaju (SE), Brazil. E-mail: danielmarques.enfermagem@gmail.com ORCID iD: http://orcid.org/0000-0002-3322-1892; [6]RN, PhD, Federal University of Amazonas/PPGENF/UFAM. Manaus (AM), Brazil. E-mail: davidnetto@ufam.edu.br ORCID iD: http://orcid.org/0000-0002-0677-0853

INTRODUCTION

Hand hygiene (HH) is a simple action, with significant impact and proven efficacy in the prevention of healthcare-related infections (HCRI), being considered an excellent indicator of quality for patient safety.[1]

The World Health Organization (WHO) estimates that, worldwide, HCRI affect one every ten patients, and its their incidence is more frequent in developing countries. Approximately 19,000 health units, in 177 countries, support HH through health campaigns, such as Save lives: clean your hands.[2]

Historical facts mark the path of including HH at health services, particularly regarding the observation made in 1847 by the physician Ignaz Philipp Semmelweis, which related the reduction of parutients' mortality to health professionals using chlorine solution for previous hand hygiene.[3,4] In this perspective, in 1854, during the Crimean War, Florence Nightingale reduced the mortality rates by adopting preventive measures of washing professionals' hands and hygiene of patients and wards.[4]

In the biological field, the skin is colonized by bacteria and fungi that heterogeneously occupy different areas of the human body, highlighting the hands of health professionals, with an estimated concentration between 10^4 and 10^6 Colony Forming Units per cm^2.[4] Thus, in order to reduce the microbial load and prevent its transmission, sanitizing the hands with soap and water or antiseptic becomes essential, by means of degermation, simply wash and antisepsis, applied to health care practice,[4-5] since hand hygiene prevents cross-transmission of microorganisms present in resident and transient microbiota.[3]

Even with the achievement of evidence about the benefits of HH over time, the professionals' adherence to this practice is still incipient and in disagreement with the guidelines recommended by the World Health Organization, which may be expanding the incidence of HCRI and, consequently, the increase in mortality of children and adults, and the elevation of health costs.[1,3,6]

In the United Uunidos of America, a study conducted in 183 hospitals with 11,282 patients found that 4.0% of them presented one or more healthcare-associated infections, especially pneumonia (21.8%), infection of the surgical site (21.8%) and gastrointestinal tract (17.1%).[7]

In Brazil, in 2010, given the epidemiological data on healthcare-associated infections, the National Epidemiological Surveillance Agency (Anvisa – *Agência Nacional de Vigilância Epidemiológica*) deployed the surveillance system for primary bloodstream infections associated with central venous catheter as a starting point for subsequent release, in 2013, of the National Program for Prevention and Control of HCRI, especially, in compliance with the strategic action of hand hygiene. [8]

In contrast to the WHO recommendation about the importance of handwashing in health services, factors like time for handwashing, lack of infrastructure and inputs, skin irritation and inadequate human resources dimensioning are considered barriers to an effective accession to HH.[9] Moreover, there is the weakness identified in the formation process of health professionals, ufavorable to the safety culture in healthcare practices.[10]

The WHO, by considering HCRI a global public health problem, in 2004, launched the World Alliance for Patient Safety, whose Goal 5 - Reduce the risk of healthcare-associated infections aims at increasing the quality of health services. The following year, linked to this alliance, the First Global Patient Safety Challenge was created, with the theme Clean Care is Safer Care, with the purpose of preventing the transmission of pathogens through hand hygiene promotion and catalyzing global commitments and actions for preventing and reducing infections.[11]

Contextualizing, in Brazil, regarding the international scenario to reduce nosocomial infections, the first initiatives related to global challenges were implemented in 2007 by means of Multimodal Strategy to Improve Hand Hygiene at Health Services[11], consolidated in 2013 with the launch of the Patient Safety Plan at Public Services, which introduced actions in risk management and the five moments essential to HH.[12]

In this perspective, the Brazilian Ministry of Health started to require the incorporation of essential components to control HCRI, considering the need for adhesion to HH as a measure that prevents cross-transmission of microorganisms. Not unlike that reality, cancer services stand out due to their type of clientele, with significant vulnerability to pathogens[13-14], bearing in mind that, in these services, patients are submitted to multiple diagnostic and therapeutic interventions that prolong their stay in the hospital environment.[15] The exposure to biological hazards, the presence of neutropenia, radiotherapeutic treatment, use of

immunosuppressive drugs and antibiotics, manipulation of catheters and surgical procedures increase the risk for infections, which demand a greater assistance by the healthcare professional.[16]

In this respect, a national survey conducted with 70,662 oncological patients identified an overall rate of 8.24% of HCRI, and the most affected topographies were surgical site (26.11%), blood stream (24.11%) and respiratory tract (18.50%). The same study showed rates of lethality and mortality associated with infection of 23.86% and 1.37%, respectively[15], which demonstrates the magnitude of the problem.

OBJECTIVE

- To analyze the adhesion to hand hygiene by professionals who provide cancer care and its correlation with the variables professional category, indication, type of conduct and used input.

METHOD

Quantitative, cross-sectional study, carried out in the department of adult and pediatric oncology of a reference hospital of Aracaju, state of Sergipe, northeastern region of Brazil.

The research sites were oncological units that offer specialized and high-complexity services for definitive diagnosis and treatment of patients with neoplasms. The hospital offers a multidisciplinary team composed by physicians, nurses, nursing technicians/assistants, physiotherapists, dieticians, speech therapists, laboratory technicians, social workers, and psychologists. The physical structure of the hospital unit consists of 39 beds; of these, 21 constitute the adult ward and 18 the pediatric ward.

Regarding the infrastructure and equipment necessary to perform the HH, in the collection period, the pediatric unit had an external sink in the nursing station, with liquid soap and paper towel; the isolation bed had a sink, a dispenser of alcohol-gel and liquid soap and other wards had a dispenser of alcohol-gel. The adult unit had two external sinks with liquid soap dispensers and paper towel, one in the corridor and the other in the nursing station, the insulations had sinks and dispensers of liquid soap.

The sample constitution considered the observation opportunities of the five moments of HH recommended by WHO (before the contact with the patient, before aseptic procedure, after body fluids, after contact with the patient and after touching the patient vicinity), carried out by multidisciplinary teams of the selected units, and the sample size calculation used the criteria described in the HH manual recommended by WHO. In addition, to ensure the representativeness of the participants, 200 HH procedures should be observed for each work shift, totaling 1200 opportunities for both oncological units selected (adult and pediatric), however, the present study recorded 1397 actions involving the HH procedure.[5]

Data collection occurred from December 2014 to December 2015, in three work shifts (morning, afternoon and evening), by means of non-participatory observation. The used instrument the note form 34 of the Technical Reference Manual for Hand Hygiene. There was a previous training for both observers and recorders of data regarding the recommended five moments, as well as to the proper completion of the search form. To fulfill this purpose, the training material provided by WHO was used.[5]

Methodologically, the observers remained at each unit for two hours and during the period of greater implementation of activities. For this, a previous immersion was performed at each unit, identifying the routines and periods of increased activity in each shift. The observers were positioned at strategic points of the wards, without disrupting the activities of the unit to observe and record the opportunities for HH and the type of action performed.

The professionals were randomly observed in pre-defined moments according to the research schedule, being the actions recorded only when the professional had availability and access to all supplies and materials necessary for hand hygiene.

Data analysis used descriptive ana analytic statistics, using Graph Pad Prism 5.0 software. For descriptive analysis, we performed calculations of frequency and for the analytical test, chi-squared (X^2), considering significant difference when p-value<0.05. Furthermore, we used the formula for calculating the adhesion recommended by WHO, as follows:

$$\text{Adherence (\%)} = \text{Performed actions/Opportunities} \times 100.$$

To determine the degree of conformity of the evaluated process (hand washing), the positivity index proposed by Carter was used, which allows determining the conformity of care practice in terms of quality, where: 100% of positivity represents a desirable

assistance; 90 to 99% adequate assistance; 80 to 89% a safe handling; 70 to 79% a borderline assistance and less than 70% an undesirable or tolerable assistance.[17]

The research protocol was approved by the Research Ethics Committee of the Federal University of Sergipe, CAAE n. 24183113.2.0000.5546.

RESULTS

There were recorded 1397 observations involving hand hygiene, 780 (56%) in the pediatric oncological unit and 617 (44%) in the adult oncological unit. Among the actions performed by professionals, 587 performed by nursing technicians/assistants (42%); 339 by nurses (24%); 242 by physicians (17%); 137 by physiotherapists (10%) and 131 (7%) by other health professionals (laboratory technicians, nutrition technicias, nutritionists, social assistants and psychologists).

The overall adhesion rate to the procedure among the observed professionals was 29% (407 actions), classified as an undesirable and tolerable assistance. The highest rate (38%) was for the category of nurses, with 129 actions and the lowest rate (10%) for the category other professionals (nine actions), there was a statistical difference between the different categories (p <0.0001) regarding adhesion to this procedure (Table 1).

Table 1. Adherence to hand hygiene among health care workers, stratified by professional category. Aracaju (SE), Brazil, 2015.

Professional category	Hand hygiene adherence rate(%) p-value <0,0001*
Nurse	38
Physioterapist	36
Nurse assistant	30
Doctor	18
Others	10

*Statistically significant differences. Chi-square test was used to assess them.

Regarding the choice of conduct and input for hand hygiene by professionals, of the 407 actions, 344 (85%) used soap and water, 63 actions (15%) used alcohol-gel, with a higher proportion in medical category - 11 (25%) and the use of soap and water in the category physiotherapists - 45 (92%), without statistical difference (p = 0.0995) between the categories regarding used of hand hygiene used (Table 2).

Table 2. Adherence to hand hygiene among health care workers, stratified by type of hand hygiene behavior and cleaning agent used. Aracaju (SE), Brazil, 2015.

Categoria Profissional	Nº of HH actions	HH with alcohol gel		HH with soap and water	
		n	%	n	%
Nurse	129	17	13%	112	87%
Doctor	44	11	25%	33	75%
Physioterapist	49	04	08%	45	92%
Technician/Auxiliary	176	28	16%	148	84%
Others	09	03	33%	06	67%
Total	407	63	15%	344	85%

HH: hand hygiene

Regarding the five moments for HH, the largest adhesion of professionals was at the time "after exposure to bodily fluids" and the lowest at "after environments near the patient". The adhesion to the recommended moments of HH was classified as undesirable or tolerable; there was statistically significant difference between the moments indicated for HH and adhesion to the procedure (p<0.0001) (Table 3).

Table 3. Adherence to hand hygiene among health care workers, according to the five moments. Aracaju (SE), Brazil, 2015.

Indicated moments for HH	HH adherence rate (%) p-value < 0.0001*
1- before touching a patient	29
2- before clean/aseptic procedure	30
3- after body fluid exposure risk	41
4- after touching a patient	33
5- after touching patient surroundings	15

DISCUSSION

Hand hygiene is the most effective procedure to prevent and control assistance-related infection.[4] This practice should be valued in the oncological services, considering the immunodepression presented by patients treated in this unit, as well as the impact on morbidity and mortality.[13]

The data analysis allowed identitfying an unwanted assistance, and consequent low adherence to HH regarding the positivity rate. There was a similar situation at a teaching hospital in Paraná that presented an adhesion rate of 26.5%.[19] In consonance with these studies, a North American university hospital found rates between 23.5% and 27.1%, demonstrating that the variation in rates of adherence was influenced by the climate of the region.[19]

Studies on structural conditions mention that low rates of professionals' adhesion to HH could be related to the unavailability of inputs (alcohol-gel, soap, detergent and paper towel), as well as lack of knowedlege on recommendations, dermatological allergies and lack of infrastructure, as the main ones.[18,20] Nevertheless, this justification is different from this study, once the observed professionals had total availability of inputs, as well as this study did not evaluate other factors and working conditions.

Regarding the choice of conduct and inputs for HH, the results indicate low compliance with the practice of using alcohol gel, corroborating surveys conducted in the southeast and south regions of Brazil, which showed, respectively, adhesion rates of 6.3% and 12.5% for the use of alcohol gel and water and soap. These results show that this group of professionals preferred soap and water as the best option for controlling HCRI.[3,18] In contrast, a study at a university hospital in Turkey showed that 65% of the nurses had preference for alcoholic antiseptic solutions.[21]

Regarding the use of products for HH, friction with alcohol gel 70% presents greater effectiveness when compared to the use of common or antiseptic soaps, considering as positive points the short time for hygiene, the input availability at the time of the assistance, no need for special infrastructure and good tolerability of the skin.[4,20,22]

As for the challenge proposed by the WHO for adherence to HH practice in the five moments, this study identified a higher rate of adhesion after contact with body fluids, which shows that health professionals often perform hand hygiene as a form of selfcare, which was also evidenced in other studies.[18,23]

Also regarding indication, according to classification of five times, the touch on the surfaces near the patient showed the lowest rate found, a worrisome facwhich is worrisome, considering the risk of contamination and the possibility of uncontrolled facilitator of dissemination of microorganisms in the hospital environment. However, in contrast, a study performed at an intensive therapy unit, Rio Grande do Sul, for this same indication, identified 49.1% rate, greater than the one presented in this study.[23] In this respect, attention is called to the fact that it shows that the professional is aware of the risks related to contact with blood and body fluids, different from the attention given when it refers to the relative risk to the surfaces near the patient, emphasizing that the risk of infection is only perceived when observed the imminent danger involving biological material potentially contaminated.

In relation to the professional categories observed, all presented a rate of adherence to HH lower than recommended by WHO, highlighting the medical categories' lowest rates and the nurses with the highest rate. In line with these findings, outcomes of a Brazilian Child-Mother Hospital presented rates of 39%, 27%, 33% and 23% for nurses, nursing technicians, physiotherapists and physicians, respectively.[24] Nevertheless, the southern region of the country showed discordant results, with a higher rate among physiotherapists (53.5%) and lower for the nursing technicians/assistants (29.8%).[23]

CONCLUSION

The rate of adherence to hand hygiene by healthcare professionals is outside of the recommendations proposed by the WHO and classified as undesirable or tolerable. The main input used by professionals to perform the HH procedure is the combination of soap and water at the expense of alcohol-gel.

Among the five moments recommended, the most used was the indication after exposure to biological material, reflecting the professionals' concern with their safety. The presented results alert the fragility presented during the care provided to cancer patients in the observed units.

In this context, there is need to develop strategies for actions of service education that ensure a safe and quality care. On the other hand, one expects a proactive role by

the teams of hospital infection control, in order to provide the basic inputs for the completion of the HH procedure, as well as monitor and disseminate the adhesion by health professionals to hand hygiene, since this conduct represents a weakness in the target institution of this study.

The evidence of a higher rate of adherence to the HH by nurses, even below the recommendations, is a positive factor, considering that these professionals develop their activities at health services with various possibilities of contacts with different patients, which makes collaborative agents in change of culture concerning the patient safety for incorporation of HH, as indicated by the WHO.

Despite being a simple procedure, the adhesion to the HH is still a challenge for the managers of health services. Therefore, it is necessary to build managerial strategies that stimulate the participation of the multiprofessional healthcare team in building a safety culture that guarantees a risk-free assistance.

Finally, we hope that this study stimulates reflection on the importance of hand hygiene and deployment of multimodal strategy, especially in oncological services. This study examined the professionals' adhesion to the HH, awakening to the need for other studies that seek to assess the potential barriers for large adhesion to the HH and coping with the problems related to healthcare-related infections.

REFERENCES

1. Prado MF, Hartmann TPS, Teixeira Filho LA. Acessibilidade da estrutura física hospitalar para a prática da higienização das mãos. Esc Anna Nery. 2013;17(2):220-6. Doi: 10.1590/S1414-81452013000200003

2. World Health Organization (WHO). Health care without avoidable infections The critical role of infection prevention and control. Genebra. 2016. [cited 2016 Apr 19]. Available from: http://apps.who.int/iris/bitstream/10665/246235/1/WHO-HIS-SDS-2016.10-eng.pdf

3. Mota EC, Barbosa DA, Silveira BRM, Rabelo TA, Silva NM, Silva PLN, et al. Higienização das mãos: uma avaliação da adesão e da prática dos profissionais de saúde no controle das infecções hospitalares. Rev Epidemiol Control Infect [Internet]. 2014 [cited 2016 May 10];4(1):12-7. Available from: https://online.unisc.br/seer/index.php/epidemiologia/article/viewFile/4052/3379

4. Ministério da Saúde. Agencia Nacional de Vigilância Sanitária (BRASIL). Segurança do Paciente. Higienização das mãos. Brasília. 2013a. [cited 2016 May 25]. Available from: http://www.anvisa.gov.br/servicosaude/manuais/paciente_hig_maos.pdf.

5. World Health Organization (WHO). Hand hygiene technical reference manual: to be used by health-care workers, trainers and observers of hand hygiene practices. 2009. [cited 2016 June 25]. Available from: http://apps.who.int/iris/bitstream/10665/44196/1/9789241598606_eng.pdf

6. Gomes AC, Carvalho PO, Lima ETA, Gomes ET, Valença MP, Cavalcanti AA. Caracterização das infecções relacionadas à assistência à saúde em Unidade de Terapia Intensiva. Rev enferm UFPE. 2014; 8(6):1577-85. DOI: 10.5205/reuol.5876-50610-1-SM.0806201417

7. Magill SS, Edwards JR, Bamberg W, Be;davs ZG, Dumyati G, Kainer MA, Lyinfield R, Maloney M, McAllister-Hollod L, Nadle J, Ray SM, Thompson DL, Wilson LE, Fridkin SK. Multistate Point-Prevalence Survey of Health Care-Associated Infections. N Engl J Med. 2014;370:1198-208. DOI: 10.1056/NEJMoa1306801

8. Padoveze Maria Clara, Fortaleza Carlos Magno Castelo Branco. Healthcare-associated infections: challenges to public health in Brazil. Rev. Saúde Pública [Internet]. 2014 Dec [cited 2017 June 09];48(6):995-1001. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-89102014000600995&lng=en. DOI:10.1590/S0034-8910.2014048004825.

9. Botene DZA, Pedro ENR. Os profissionais da saúde e a higienização das mãos: uma questão de segurança do paciente pediátrico. Rev Gaúcha Enferm. 2014 set;35(3):124-9. DOI:10.1590/1983-1447.2014.03.44306

10. Hass JP, Larson EL. Compliance with hand hygiene guidelines: where are we in 2008?. Am J Nurs. 2008 Aug;108(8):40-4. DOI: 10.1097/01.NAJ.0000330260.76229.71

11. Tatarelli P, Lorenzi I, Caviglia I, Sacco RA, La Masa D, & Castagnola E. Estimation of mean number of daily hand hygiene procedures per patient can represent an effective and easy understandable method to evaluate adherence experience in a tertiary care pediatric hospital of Northern Italy. J J Prev Med Hyg [Internet]. 2016 [cited 2017 Jun 15];57(4):185–9. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5289028/

12. Resolução - RDC Nº 36, de 25 de julho de 2013 (BR). Institui ações para a segurança

do paciente em serviços de saúde e dá outras providências. 2013b. [cited 2016 Feb 20]. Availablefrom: http://www.pmf.sc.gov.br/arquivos/arquivos/pdf/20_06_2016_18.03.42.cc79405739e9b21c4e6d8eb54086045c.pdf

13. Sanhudo NF, Moreira MC, Carvalho V. Tendências da produção do conhecimento de enfermagem no controle de infecção em oncologia. Rev Gaúcha Enferm. 2011 June; 32(2):402-10. DOI:10.1590/S1983-14472011000200026

14. Thom, K. A.; Kleinberg, M.; Roghmann, MC. Infection Prevention in the Cancer Center. Clin Infect Dis. 2013 Aug 15;57(4): 579–85. DOI: 10.1093/cid/cit290

15. Santos SLV, Sousab TK, Costa DM, Lopes LKO, Pelejad EB, Sousa DM, et al. Infecciones asociadas a la atención de salud en un Hospital de Oncología Brasileño: análisis de cinco años. Enferm glob [Internet]. 2012 [cited 2016 June 15];11(25):8-17. Available from:https://digitum.um.es/xmlui/bitstream/10201/27399/1/Infecciones%20asociadas%20a%20la%20atencion%20de%20salud%20en%20un%20Hospital%20de.pdf

16. Castro PTO. Aspectos essenciais no controle de infecção hospitalar em situações especiais: controle de IH em pacientes oncológicos. 17ª Jornada de Controle de Infecção Hospitalar. Comissão de Controle de Infecção Hospitalar do Hospital de Câncer de Barretos; 25 maio 2012; São Paulo, 2012. Available from: http://www.saofrancisco.com.br/17_jornada/controledeihempacientesoncologicos.pdf

17. Silva SG, Salles RK, Nascimento ERP, Bertoncello KCG, Cavalcanti CDAK. Avaliação de um bundle de prevenção da pneumonia associada à ventilação mecânica em unidade de terapia intensiva. Texto Contexto Enferm, Florianópolis, 2014 July-Sept; 23(3): 744-50. DOI:10.1590/0104-07072014002550013

18. Bathke J, Cunico PA, Maziero ECS, Cauduro FLF, Sarquis LMM, Cruz EDA. Infraestrutura e adesão à higienização das mãos: desafios à segurança do paciente. Rev Gaúcha Enferm. 2013;34(2):78-85. DOI:10.1590/S198314472013000200010

19. D'egidio G, Patel R, Rashidi B, Mansour M, Sabri E, Milgram P. A study of the efficacy of flashing lights to increase the salience of alcohol-gel dispensers for improving hand hygiene compliance. Am J Infect Control. 2014 Aug; 42(8): 852-5. DOI:10.1016/j.ajic.2014.04.017

20. Sharma M, Joshi R, Shah H, Macaden R, Lundborg CS. A step-wise approach toward introduction of an alcohol based hand rub, and implementation of front line ownership-using a, rural, tertiary care hospital in central India as a model. BMC Health Serv Res. 2015 Apr 29;15:182. DOI:10.1186/s12913-015-0840-1

21. Findik UY, Otkun MT, Erkan T, Sut N. Evaluation of Handwashing Behaviors and Analysis of Hand Flora of Intensive Care Unit Nurses. Asian Nurs Res. 2011; 5(2): 99-107. DOI:10.1016/S1976-1317(11)60018-2

22. Mathur P. Hand hygiene: Back to the basics of infection control. Indian J Med Res. 2011 Nov; 134(5): 611-20. DOI:10.4103/0971-5916.90985

23. Souza LM; Ramos MF, Becker ESS, Meirelles LCS, Monteiro SAO. Adesão dos profissionais de terapia intensiva aos cinco momentos da higienização das mãos. Rev Gaúcha Enferm. 2015. 36(4):21-8. DOI:10.1590/1983-1447.2015.04.49090

24. Mendes FMR, Freitas FTM, Araujo AFOL, Padovani TMSJ. Sucesso na melhoria da Higienização das mãos em um Hospital materno infantil. J Infect Control [Internet]. 2013 [cited 2016 June 15]; 2(3):150-2. Available from: http://jic.abih.net.br/index.php/jic/article/viewFile/59/pdf

Submission: 2017/11/14
Accepted: 2018/04/23
Publishing: 2018/06/01

Corresponding Address

Eliana Ofelia LLapa-Rodríguez
Departamento de Enfermagem
Rua Cláudio Batista, s/n
Bairro Cidade Nova
CEP: 49060-108 – Aracaju (SE), Brazil