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Knowledge, attitudes and practices of nursing professionals regarding hand hygiene in a hospital setting

Conhecimentos, atitudes e práticas dos profissionais de enfermagem sobre higiene das mãos no ambiente hospitalar

Conocimientos, actitudes y prácticas de los profesionales de enfermería sobre la higiene de las manos en el ambiente hospitalario

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This is a sectional, quantitative study aiming to evaluate the knowledge, attitudes and practices of the nursing team on Hand Sanitation (HS). 135 nursing professionals from a Teaching Hospital answered the Questionnaire on Knowledge, attitudes and practices related to hand sanitation. Data were submitted to univariate descriptive analysis. All participants in the research (100%) believe that HS is an important procedure in preventing infections and more than 50% consider work overload and the reduced number of gel alcohol dispensers as obstacles to HS in daily clinical practice. Partnerships being made with the Nursing Education Service (SEE) and the Hospital infection Control Commission of the institution are seen as facilitators, so that professionals improve their knowledge and clarify doubts about HS.
Descriptors: Hand hygiene; Nursing team; Attitude of health personnel.

Trata-se de estudo seccional, de abordagem quantitativa com o objetivo de avaliar os conhecimentos, atitudes e práticas da equipe de enfermagem sobre higienização das mãos (HM). Pesquisou-se 135 profissionais de enfermagem de um hospital universitário que responderam ao Questionário de Conhecimentos, Atitudes e Práticas relacionadas à higiene das mãos. Os dados foram submetidos à análise descritiva univariada. Todos os participantes da investigação (100%) acreditam que a HM é um procedimento importante na prevenção de infecção e, mais de 50% consideram a sobrecarga de trabalho e o número reduzido de dispensadores de álcool gel como obstáculos à HM na prática clínica diária. A criação de parcerias com o Serviço de Educação em Enfermagem (SEE) e Comissão de Controle de Infecção Hospitalar da instituição de estudo são considerados facilitadores para que os profissionais aprimorem os conhecimentos e esclareçam dúvidas sobre HM.
Descritores: Higiene das mãos; Equipe de enfermagem; Atitude do pessoal de saúde.

Se trata de un estudio seccional, de abordaje cuantitativo con el objetivo de evaluar los conocimientos, actitudes y prácticas del equipo de enfermería sobre higienización de las manos (HM). Se investigaron 135 profesionales de enfermería de un hospital universitario que respondieron el Cuestionario de Conocimientos, Actitudes y Prácticas relacionadas a la higiene de las manos. Los datos fueron sometidos a un análisis descriptivo univariado. Todos los participantes de la investigación (100%) creen que la HM es un procedimiento importante en la prevención de infección y, más del 50% consideran la sobrecarga de trabajo y el número reducido de dispensers de alcohol en gel como obstáculos para la HM en la práctica clínica diaria. La creación de asociaciones con el Servicio de Educación en Enfermería (SEE) y la Comisión de Control de Infección Hospitalaria de la institución de estudio es considerada una facilitadora para que los profesionales mejoren los conocimientos y aclaren dudas sobre la HM.
Descriptores: Higiene de las manos; Grupo de enfermería; Actitud del personal de salud.

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INTRODUCTION

Health care related infections are complications acquired during hospitalization, and represent a serious health problem. They constitute one of the main causes of death among hospitalized patients, especially in developing countries. These infections prolong the permanence of the patient in the hospital, compromise their safety and increase antimicrobial resistance[1].

According to the World Health Organization (WHO), the prevalence of health care-related infections in developed countries is located of 7.6 for each 100 patients, while developing countries register 15.5 for each 100 pacients[1,2]. Between 25% and 33% of patients admitted in Intensive Care Units (ICUs) present complications associated with the use of new technologies and invasive procedures for diagnosis and treatment. This situation is significant for the patient, family, and health institutions, impacting all involved socioeconomic aspects[1,2].

In 2005, the WHO proposed the first Global Patient Safety Challenge, called ' Clean Care is Safer Care', among whose goals is the improvement of hand sanitizing practices (HS), to prevent infections and promote the safety of patients and professionals[1,2].

In Brazil, the National Health Surveillance Agency (ANVISA), in cooperation with the WHO and the Pan American Health Organization (PAHO), started actions to prevent infections in health services. Guidelines were developed to encourage the hand hygiene in health units, regardless of the number of beds or complexity. A multimodal strategy was adopted, since it is a reliable method of offering HS technique improvements to be used in health units[3].

However, adherence to this practice by the health team has been unsatisfactory, a challenge when faced with the fact that professionals continue not doing it adequately[4].

Studies point out the importance of identifying knowledge, attitudes, perceptions and practices of healthcare professionals regarding HS as a means to plan programs for preventing infections related to health[5-10]. The objective of this research was to investigate the knowledge, attitudes and practices of the nursing staff on hand hygiene.

METHOD

This study is a descriptive study, a sectional census with quantitative approach, developed by means of inquiry based on a validated model[11] regarding the knowledge, attitudes and practices (KAP) in health as to HS. The study was developed with nursing professionals in the different hospitalization units of a university hospital located in Minas Gerais, Brazil. In the inclusion criteria were the professionals who had been regularly registered as employees of the institution for at least a month. Professionals who were on health leave or absent from work for any reason were excluded.

Before the data collection period started, a list with all the nursing professionals from the hospital was acquired from the Human Resources sector, as well as a list of work shifts with the Nursing Administration of the hospital. Data collection was conducted in all periods and hospitalization units, with all professionals who met the inclusion criteria.

153 subjects participated. All participants signed the Free and Informed Consent Form. Data collection was conduced at times determined by participants, so as not to interfere with their working activities.

Data was collected from September/2014 to March/2015 through self-application of the following instruments: the Sociodemographic and Professional Characterization Questionnaire and the Questionnaire on Knowledge, Attitudes and Practices related to hand sanitation, consisting of 40 questions related to knowledge, 22 to attitudes and 21 to practice.

Data was typed through double input with subsequent validation, through Microsoft Excel. The subsequent statistical analysis used the Statistical Package for the Social Sciences (SPSS) software, version 22. Data was tabulated and analyzed by descriptive statistical analysis.

The study was approved by the UFTM Ethics Committee, under Protocol N ° 2621/2013. This study complied with the

rules established by resolution No 466/2012 of the National Health Council.

RESULTS

135 professionals participated in the study, of which 86.7% were female. Most (56.3%) were nursing technicians, followed by nurses (34.8%) and nursing auxiliaries (8.9%). The average years of faculty education of nursing was 12.8 years (SD=8.0), while the average time of professional experience of 12.4 years (SD=8.35). The average time working in the institution was 7.8 years (SD=7.99).

Considering the knowledge of the professionals on the use of alcohol gel, the results show that the participants recognize the appropriate moments for HS with this product, except in situations in which invasive devices are used, and between different locations in the body of the same patient.

In the evaluation of hand ornaments that can be considered fomites, interfering with the hygiene of the hands, more than 90% recognize that they influence quality of the sanitation process. Participants do not recognize the bar of soap and cloth towel as agents of risk in health care. It is emphasized that 2% degerming chlorhexidine was recognized as an important antiseptic for hand sanitation. The steps of the HS technique are recognized by 90% of the professionals (Table 1).

It was evident that professionals do not recognize gel alcohol as an antiseptic that can replace hand washing when there is no visible dirt. They also clearly believe that using gloves does not substitute HS (Table 2). Among the activities in the process of care, the belief that hand sanitation was important after the performance of administrative tasks had the worst result (82.2%).

Considering the practice of hand sanitation, half the workers utilize alcohol gel in patient care, but rarely apply to that use the same techniques they apply when washing their hands through the use of soap and water. 105 professionals (77.8%) stated that they perform HS in the standard technique of the institution, while and 3% use only water. More than 90% of the professionals claimed to perform HM in procedures like preparing medicinal products, after removing the gloves, in the handling of surfaces and performing the physical examination. Most professionals do not use any ornaments in the practice of Assistance (Table 3).

Table 1. Knowledge of nursing professionals about the use of alcohol gel, ornaments, products and inputs used in HS and the correct technique. Clinical Hospital, Uberaba, MG, Brazil, 2015.

Knowledge	**Yes**		**No**	
Gel alcohol as hand sanitizer	**n**	**%**	**n**	**%**
After contact with surfaces in the patient's bed	107	(79.3)	28	(20.7)
Before the patient's clinical examination	108	(80.0)	27	(20.0)
Before the use of gloves	82	(60.7)	53	(39.3)
After contact with healthy parts of the patient's skin	100	(74.1)	35	(25.9)
Before handling invasive devices	61	(45.2)	74	(54.8)
Between two parts of the body of the same patient	64	(47.4)	71	(52.6)
Ornaments that interfere in HS				
Rings	134	(99.3)	1	(0.7)
Bracelets	125	(92.6)	10	(7.4)
Watch	124	(91.9)	11	(8.1)
Wedding/commitment rings	124	(91.9)	11	(8.1)
Products and inputs used in HS				
Bar soap	12	(8.9)	123	(91.1)
2% degerming chlorhexidine	126	(93.3)	9	(6.7)
Gel alcohol	94	(69.6)	41	(30.4)
Fabric towels	3	(2.2)	132	(97.8)
Disposable paper towels	133	(98.5)	2	(1.5)
Heated air	41	(30.4)	94	(69.6)
Correct HS technique				
Open the tap and wet your hands	123	(91.1)	12	(8.9)
Apply liquid soap In the palm of your hands	130	(96.3)	5	(3.7)
Use the soap in the palm and back of both hands	129	(95.6)	6	(4.4)
Rub nails and interdigital spaces	129	(95.6)	6	(4.4)
Rub fists and thumbs	131	(97.0)	4	(3.0)
Rinse the hands from the fingers towards the fists	123	(91.1)	12	(8.9)
Close tap using paper towels	124	(91.9)	11	(8.1)

Table 2. Beliefs of nursing professionals regarding hand sanitation. Clinical Hospital, Uberaba, MG, Brazil, 2015.

Beliefs	**Yes**		**No**		**I don't know**	
Beliefs	**n**	**%**	**n**	**%**	**n**	**%**
HS is an important procedure in preventing infections	135	(100.0)	–	–	–	–
Washing hands with water and soap is an effective measure to prevent infections	132	(97.8)	3	(2.2)	–	–
The continuous use of antiseptic soap in intensive therapy is necessary	115	(85.2)	14	(10.4)	6	(4.4)
Long fingernails risk transmitting infection	133	(98.5)	2	(1.5)	–	–
The use of watches is permitted during an appropriate HS process	8	(5.9)	123	(91.1)	4	(3.0)
Switching gloves between patients is important	131	(97.0)	4	(3.0)	–	–
The use of gloves replaces HS	1	(0.7)	134	(99.3)	–	–
Gel alcohol is just a complement to HS	96	(71.1)	38	(28.1)	1	(0.7)
Beliefs related to HS situations						
After using the bathroom	135	(100.0)	–	–	–	–
After administrative activities	111	(82.2)	20	(14.8)	4	(3.0)
After removing gloves	133	(98.5)	2	(1.5)	–	–
Before preparing medication	133	(98.5)	2	(1.5)	–	–
From one patient to the other	135	(100.0)	–	–	–	–
After handling equipment or surfaces near the patient	132	(97.8)	3	(2.2)	–	–
After the patient's physical examination	134	(99.3)	1	(0.7)	–	–
After auscultating a patient	130	(96.3)	4	(3.0)	1	(0.7)

Table 3 - Situations in which the nursing professional recognizes the frequency with which they sanitize their hands. University Hospital, 2015.

Situation	Always		Rarely		Never	
Use of gel alcohol	**n**	**%**	**n**	**%**	**n**	**%**
Applies gel alcohol in hands with the same technique used with water and soap	52	(38.5)	72	(53.3)	11	(8.1)
Use the gel alcohol before approaching the patient's bed	80	(59.3)	48	(35.6)	7	(5.2)
Use alcohol gel when leaving the patient's bed	78	(57.8)	50	(37.0)	7	(5.2)
Use gel alcohol before handling invasive devices	67	(49.6)	46	(34.1)	22	(16.3)
Hand Hygiene						
Wash hands with soap and water following the technique	105	(77.8)	29	(21.5)	1	(0.7)
Swap gloves between different parts of the same patient's body during care	102	(75.6)	31	23)	2	(1.5)
Use only water when hand washing	4	(3.0)	4	(3.0)	127	(94.1)
After removing gloves	135	(100)	–	–	–	–
Before preparing medication	132	(97.8)	3	(2.2)	–	–
From one patient to the other	133	(98.5)	2	(1.5)	–	–
After handling equipment or surfaces near the patient	122	(90.4)	13	(9.6)	–	–
After the patient's physical examination	129	(95.6)	5	(3.7)	1	(0.7)
After auscultating a patient	120	(88.9)	12	(8.9)	3	(2.2)
Use of ornaments in working hours						
Use rings during working hours	16	(11.9)	32	(23.7)	87	(64.4)
Use wedding/commitment ring during working hours	37	(27.4)	20	(14.8)	78	(57.8)
Use watch at work time	45	(33.3)	17	(12.6)	73	(54.1)

DISCUSSION

HS is one of the most effective methods for preventing, controlling and reducing health care associated infections. Clinical, experimental and epidemiological studies about the theme focus on the implantation of hydro-alcohol solutions and the evaluation of their use with different strategies[5,7-11]. The results indicate the existence of important gaps in the knowledge of the nursing staff related to the concepts of HS, for example, doubts about the manipulation of invasive devices and between parts of the body of the same patient.

Regarding the level of information, they recognize that alcohol gel is a hand sanitizer and should be used after contact with surfaces in the patient's unit, prior to clinical examinations, after direct skin manipulation and before the use of gloves.

The advantages of alcoholic gel preparations include: greater effectiveness in eliminating the bacteria from hands; less damage to the skin than ordinary soap and conventional degerming solutions; greater ease of use; and being easily available on the sides of the patient bed. All of these factors make access easier and encourage the use of the product[5,7-9,11-14].

90% of respondents stated that they do not use gel alcohol when their hands are visibly dirty or contaminated with blood

and/or bodily fluids. That result is sensible considering the purpose of the use of gel alcohol in reducing the microbial load of the hands, without removing dirt particles[3,5,7-9,11-14].

Rings, wedding rings, bracelets and watches have been recognized as ornaments that interfere with hand hygiene. Although infection control guidelines recommend that ornaments should not be worn by health care professionals in their professional exercise, a large proportion of them continue to do so[11,14,15].

As for the products used in HS, it was found that the professionals consider the use of degerming chlorhexidine as the most adequate product for this procedure. Similar results were found in the literature, emphasizing that the main factors in the reduction of microbes are the active ingredient of the solution used and friction movements done while cleaning the hands with it[13,14,16,17].

As for the use of iodopovidone (PVPI), 84.4% of respondents considered that the product is not satisfactory for HS. Both chlorhexidine and PVPI cause immediate reduction of bacteria; however, chlorhexidine os less effective, since the PVPI is not very efficient when it comes to residual and cumulative activity, when compared to chlorhexidine[14,16,17]. Such factors favor the disuse of PVPI in hospital institutions.

Paper towels are adopted as the main product for drying hands. Cloth towels are recognized as inadequate for this purpose, since they keep the moisture and promote bacterial proliferation. For a part of the professionals the use of heated air in hospitals is not adequate, and its activation may favor the contamination of the hands[5,7-10,14,16,17].

As to the knowledge about the technique of HSs, the act of opening the tap and wetting the hands, rinsing the hands from the fists to the fingers, and closing the tap through the use of paper towels, was conducted inadequately by 8.5% of respondents. Studies on the appropriate technique indicate that professionals do not perform a completely correct technique, which is quite concerning, since the nursing staff and physicians perform invasive procedures, risking infections in patients with a greater susceptibility to infections by microorganisms[4,12-14,17].

Valuing beliefs has been instrumental in the context of HS, starting from the perception of risks, attitudes and expectations in the different stages of the process of change that the professionals go through[5,10,11,18,19]. Through it, positive situations based on knowledge can can be noticed through data regarding the attitudes of the professionals. Studies on this theme highlight that the beliefs of the professionals in the exercise of direct care to patients considered to be priorities are limiting factors for their practice[5,10,11].

For a significant portion of them, gel alcohol is mistakenly regarded as a complement to hand hygiene, even though it was recognized by professionals as a product they use in the "knowledge" field of the questionnaire. A research relating two tertiary level institutions corroborate this study, finding that 59.9% and 53.8% of professionals considered gel alcohol as a complement of HS[10].

The WHO recommends the friction of the hands with an alcohol preparation as the main form of routine hygiene of the hands, constituting the only fast and effective means for inactivation of an ample number of microorganisms[1,2]. Another study pointed out the effectiveness of alcohol-based products in dirty hands with blood and contaminated with Serratia Marcescens, through the use of three alcoholic products with different percentages (62% gel alcohol; 70% gel alcohol 70% and 70% liquid alcohol with 2% glycerine). The result showed that liquid alcohol reduced the number of bacteria in approximately 99.9%, being more effective than degerming solutions[17].

It stands out that 5.9% of respondents believe that the use of a watch during HS's technique is permitted, while more than 90% acknowledge that the ornaments interfere and elevate the transmission of infection. The beliefs of the latter, thus, are based on knowledge. Studies highlight that rings are the main elements that carry microorganisms, and that the microbial concentration in the

hands of the professionals is directly proportional to the amount of ornaments they use[11,13].

Among the professionals, 2.2% do not consider it important to perform HS after handling equipment or surfaces close to the patient. This can be justified by the predisposition of the professionals to carry out HS only after contact with contaminated or visibly dirty surfaces. However, surfaces next to patients are considered to be of greater risk for the transmission of microorganisms[14].

More than 82% of participants acknowledge the importance of HS in specific situations, among them, the provision of care to different patients. In an emergency unit, 85.7% of respondents mentioned to always do HS after contact with the patient, pointing out that this procedure is linked to the combat of indirect-transmission [14]. HS is recognized as a key element in reducing the incidence of hospital infections. As recommended by the WHO, scientific evidence guides the implantation of the alcohol solutions and the need to evaluate them[2]. The use of a motivational tool called positive deviation was considered, as it identifies groups of individuals who solve problems better than others, without counting additional resources. Some studies corroborate the findings of this work, highlighting the concern of professionals not to expose themselves to the risk of acquiring diseases[3-7,8-11,19].

A systematic review found hidden and valuable components of HS improvement strategies. The approaches that focused solely on determinants such as knowledge, awareness, action control and facilitation are not sufficient to change the behavior of professionals regardgin HS. The focus on a combination of different strategies generates better results, indicating the need for greater creativity in applying alternative improvement activities that include determinants such as social influence, attitude, self-effectiveness or intention[20].

The obstacles related to HS were: work overload, reduced number of sinks and gel alcohol dispensers, soap quality, lack of equipment and accessibility to inputs used in assistance, not to mention lack of time and forgetfulness. The absence of standards and routines for adhering to this practice is far from the national and international guidelines, especially when considering the current scenario, which is proven due to the increased number of infections, that constitutes a risk to the safety of patients and thus, to that of the professionals[5, 8-11,13,15,19].

The offer of appropriate products and infrastructure, as well as actions and strategies of overcoming barriers function as encouragement for hand hygiene[4,5,7-11,13 15, 19]. However, the professionals only considered work overload and the reduced number of alcohol gel dispensers in their statements, both being mentioned by more than 50%. They state as reasons for this the high workload, coupled with a small number of professionals[8,20].

CONCLUSION

The study allowed to evaluate the knowledge of the professionals in order to consider their beliefs and attitudes in clinical practice.

Nursing professionals showed to have good academic knowledge, although they were mistaken in two situations: the use of alcohol gel before the handling of invasive devices and between two parts of the body of the same patient. It was found that in most situations HS was seen as an indispensable technique in preventing infections. One of the answers given by the professionals diverged from existing knowledge, since they believed that gel alcohol was merely a complement to HS.

Positive results stand out regarding HS routines. However, some attitudes, like the technique used in the use for HS with alcohol solutions and the percentage of the use of ornaments, should be addressed.

The workload and the reduced number of gel alcohol dispensers have been pointed out by the professionals as obstacles for conducting adequate HS. Increasing the number of dispensers and conducting educational actions on the use of alcohol solutions could potentially improve the situation.

Partnerships with the Nursing Education Service (SEE) and the Committee for the Control of Hospital Infections of the institution where the study was conducted are considered as potential facilitators to improve knowledge and clear doubts about HS.

The study has limitations concerning the description of its setting, since it was conducted in a single center and the sample was limited to the nursing staff.

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CONTRIBUTIONS

Nayara Ramos Moreira Soares was responsible for the design of the study, data collection, analysis and for final writing of the article. **Delvane José de Souza** took part in the revision of the article, it bibliographic normalization, and corrected the final writing of the article**. Maria Beatriz Guimarães Ferreira** conducted the statistical analysis of the data. **Eva Claudia Vênancio** and **Luciana Paiva** contributed with data analysis and with the theoretical justification of the study. **Divanice Contim** guided and supervised all the phases of the research.

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