

## PATIENT'S SAFETY: KNOWLEDGE OF HEALTH STUDENTS ABOUT HAND HYGIENE<sup>1</sup>

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### ABSTRACT

There are several reasons for the occurrence of infections related to health assistance and its consequences influences the time of treatment and prognosis of the patient. Being the hand hygiene an efficient and economical method to prevent transmission of microorganisms, this study aimed to identify the knowledge of health care students of the Federal University of São Carlos (UFSCar) about hand hygiene, within the concept of patient's safety. Using a quantitative approach method, it was applied 222 structured guides to students of nursing, physiotherapy, occupational therapy and medicine, being the data analyzed using descriptive statistics. From the total of correct answers of the guide, all courses have achieved a score greater than 75%. The fragilities identified in knowledge related to: hand hygiene as a method of protection against acquisition of infections; the use and recommendation of 70% alcohol and detergents formulations; and the recommendation for not using electric dryers. It was observed that the students consolidated basic knowledge on the subject during graduation. However, those fragilities could compromise the security of the patient and professional, being necessary a greater approach on this subject during the academic education.

**Keywords:** Handwashing. Exposure to biological agents. Knowledge. Students, health occupations. Patient safety.

### INTRODUCTION

The infection related to health care (IRAS, in Portuguese) is a major public health problem, influences morbidity and mortality, length of stay and spending diagnosis and therapy. The acquisition of new morbidities during hospitalization generates strong emotional impact on the patient due to the possibility of pathological complications, difficulties in healing and delayed discharge, increased microbial resistance, high cost for patients and families, compromising their relationships with friends and work plus lead to death<sup>(1,2)</sup>.

Among the contributing factors to the occurrence of the IRAS, cites the involvement of health professionals, which can transmit pathogenic microorganisms from one patient to another<sup>(3)</sup>.

Whereas the incidence and severity of IRAS, the World Health Organization (WHO),

in 2005, launched the first Global Challenge for Patient Safety, which aims the Clean Care is Safer Care. Its goal was to stimulate focus and international actions to safe care. As an extension of the program, in 2009, came the global campaign "sanitize hands saves lives". Which aimed to improve hand hygiene (HH) and showed that this should be considered the first step in infection control and patient's safety<sup>(4)</sup>.

The HH is the easiest and most economical way to prevent the transmission of pathogenic microorganisms, considering the hands important means of spreading infections and main working tools for professionals in the health field. For effective prevention, must occur before and after contact with patients or their environment, regardless of the use of gloves<sup>(3,5)</sup>.

According to the recommendations made by the National Health Surveillance Agency (ANVISA), the HH must be performed by "all

<sup>1</sup>Original Article, based in Scientific Initiation Research financially supported by support foundation research of São Paulo State (Process N 2010/19623-0). Presented in XIII Pan American Nursing Research Colloquium.

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professionals working in health services, which have direct or indirect contact with patients, working in the handling of medicines, food and equipment sterile or contaminated"<sup>(6:57)</sup>.

However, its membership has proved unsatisfactory. A study<sup>(7)</sup> performed in a teaching hospital found that from the 1316 records of opportunities to perform the HH, in 72,3% there was no adhesion, and in none of the sectors was possible to observe an index higher than 50%. Situation also identified by another study<sup>(8)</sup> in primary care, where, before of 298 opportunities, HH was not performed in 40,9% of them.

As reasons for the low uptake of HH, there are: use of gloves, lack of time, skin irritation, lack of inputs for practice and high demand for HH<sup>(5)</sup>.

For proper adhesion to HH nursing students, a study<sup>(3)</sup> showed that 50% made hands' hygiene before and after the procedures, while 42,4% did so only after performing some procedure and only 6,5% before. However, only 8,8% of students correctly followed the steps for the effective and proper hygiene.

Since literature data indicate a low adherence to HH for professional or graduate students in health<sup>(3,7,8)</sup>, it was found that one needs to reflect on how this issue is addressed across the different courses in the area. This study aimed to evaluate the knowledge of undergraduate courses in the area of health on HH, identifying potential weaknesses in that knowledge in order to support the approach on the subject in the teaching of health care, contributing to the strengthening of the concept of security patient.

## METHODOLOGY

This is an exploratory, descriptive study with a quantitative approach, aimed at investigating the knowledge of graduate students in the health field about hand hygiene.

The work was approved by the Ethics Committee on Human Research of UFSCar, Opinion N° 155/2011, which followed the

Resolution 196/96, conducting research in an ethical manner, ensuring the confidentiality of the identity of its participants and respecting the will and interest in participating in the study. The data collection began only after the clarification and signing the consent form.

The study subjects comprised 222 undergraduate students (62 nurses, 57 physical therapists, 87 occupational therapists and 16 of medicine) that had already been entered into the field of professional practice and agreed to participate.

The data collection was conducted by the authors and given to students in the health field through a structured, self-administered questionnaire in the period from April to September 2011. This questionnaire was based on the Manual Hand Hygiene in Health Services ANVISA<sup>(9)</sup> and evaluated by three experts. It was presented six questions that should be true-or-false, and on questions "one" and "two" had six items; questions in the "three", "four" and "six", four items; and "five", five items, adding the total of 29 items. The success of all amounted to hit 100% of the questionnaire. The data and graphs were arranged in spreadsheets Microsoft Office Excel 2007. Analysis was taken from the descriptive statistics (measures of central tendency, frequency) and variation coefficient of Pearson (VCP), using the same software, and data presented from tables and charts.

## RESULTS AND DISCUSSION

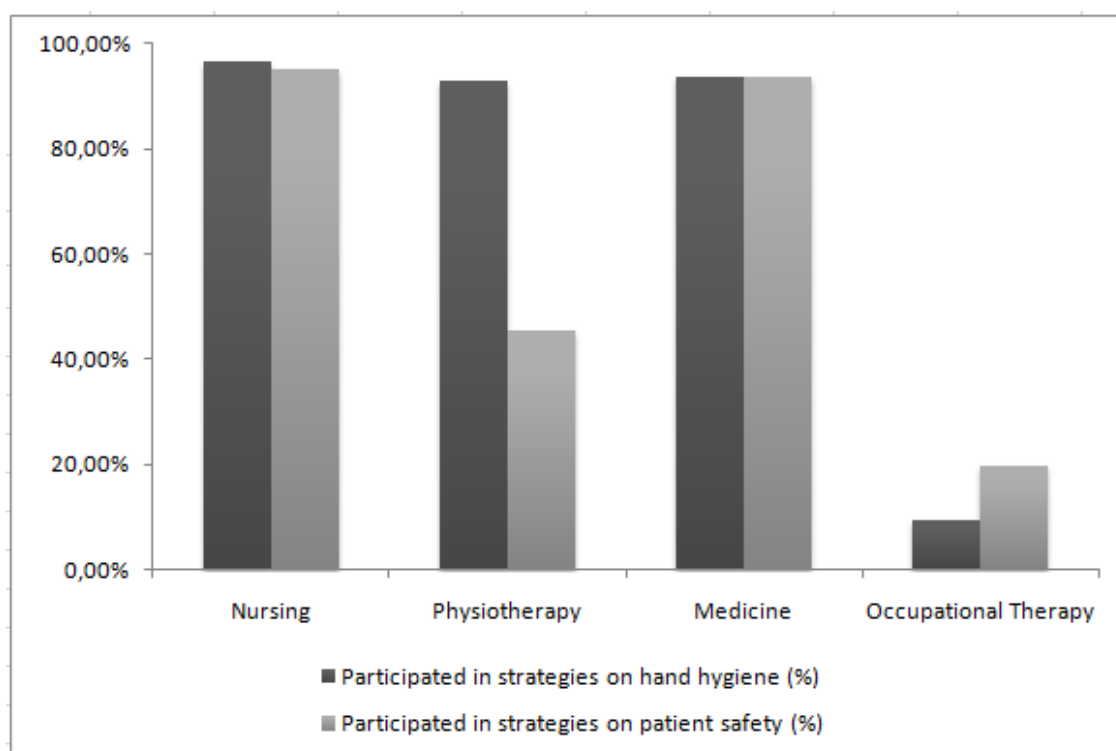
Of the 222 study participants, 116 had previously participated in specific educational strategies on the principles of patient safety and 136 of HH (Graph 1).

In courses of nursing and medicine, the concepts on patient's safety and correct technique for HH were recognized by graduates in their training process. In the course of therapy, the majority acknowledged not having participated strategies on patient safety, while in occupational therapy, the majority did not identify any of the subjects in their training process.

In a study of HH it was found that 96% of students in various courses reported participation in formal activities involving this practice, which is

close to the above findings, it is imperative to students' awareness about the need for HH to

individual security and collective and control of IRAS<sup>(10)</sup>.



**Graph 1** - Distribution of students per course, according to the participation strategies on hand hygiene and patient safety. São Carlos, SP, Brazil, 2011.

The mean score in the evaluation of concepts on HH was 85% (nursing), 77,5% (physical therapy); 77% (medicine) and 75.3% (occupational therapy) (Table 1).

The literature<sup>(10,11)</sup> indicates that both academic and health professionals have demonstrated theoretical knowledge about HH, confirming the findings of this study, that this fact was noticed.

However, despite the knowledge, it is identified repeatedly professional neglects opportunities to perform the basic steps necessary to prevent infections, leading to low adherence to HH, the use of gloves and skin antiseptics, being held at rates ranging from 5% to 81%. These circumstances show that there is still a dichotomy between knowing and doing<sup>(10,11,12,13)</sup>.

**Table 1** - Frequency of hits on the evaluation of concepts about HH according to the graduate program. São Carlos (SP) - Brazil, 2011.

Course	100  - 75%		75  - 50%		Total
	n	%	n	%	%
Nursing	58	93,55	4	6,45	100
Physiotherapy	40	70,18	17	29,82	100
Medicine	11	68,75	5	31,25	100
Occupational Therapy	56	64,37	31	35,63	100

This information shows that the non-adherence to the technique cannot be exclusively attributed to lack of knowledge. However, it is observed that strategies can

help change this behavior. Among which we mention: the availability of inputs to HH less irritating to the skin, availability of alcoholic solutions, inserting posters and developing

educational strategies that consider individual, group and institutional aspects, starting from a diverse and multidisciplinary approach<sup>(5)</sup>.

Such circumstances reinforce the idea that students should be encouraged to reflect on the importance of the practice of HH during graduation so they can incorporate it into their training and professional process. That's because it observes a passive attitude of health professionals on the HH, who perform the technique incorrectly or have an unsatisfactory adhesion<sup>(3,6)</sup>.

In table 2 it is possible to see the results for the successes of the students with the issues that addressed the importance, indications and technique of HH.

The students of this research showed the importance of understanding HH, since the low value of standard deviation (SD) and

Coefficient of Variation of Pearson (VCP) indicates that the average can be considered the value that represents the successes of this issue. The same situation can be identified in the literature, where 89% of the students recognize the importance of hands as a vehicle of cross contamination<sup>(10)</sup>.

Regarding the indication of the time of completion of MH, all courses next to the obtained average maximum hits, and the SD and VCP showed a small change in score for all. A study shows that over 80% of students considered necessary MH at the beginning and end of the work shift, before each call, after removing gloves and after each treatment<sup>(10)</sup>. The data coincide with this study, whose students knew about the opportune moments for HH.

**Table 2** - Distribution of participants according to importance, indications and technique of HH. São Carlos (SP) - Brazil, 2011.

	Course	Maximum	Minimum	Average	Mode	SD	VCP (%)
<b>Importance of HH</b>	Nursing	6	4	5,02	5	0,76	15,14
	Physiotherapy	6	4	5,14	5	0,61	11,87
	Medicine	6	4	4,69	5	0,60	12,79
	Occupational Therapy	6	3	4,77	5	0,69	14,47
<b>Indication of the moments of realization of HH</b>	Nursing	6	5	5,90	6	0,30	5,08
	Physiotherapy	6	5	5,91	6	0,29	4,91
	Medicine	6	5	5,94	6	0,25	4,21
	Occupational Therapy	6	4	5,84	6	0,40	6,85
<b>Technique of HH</b>	Nursing	5	3	3,90	4	0,50	12,82
	Physiotherapy	5	2	3,05	3	0,35	11,48
	Medicine	5	3	3,19	3	0,54	16,93
	Occupational Therapy	5	2	3,05	3	0,53	17,38

The question about how the HH should be addressed from the technical solution to be employed. In all courses there were students who had answered every question and no student zeroed. The frequency of correct responses was also above 50% and the variation of SD and VCP was small, indicating that there is a theoretical understanding of the HH.

The results relating to adjustments of the undergraduates in matters addressed the resources used for the HH can be found in table 3.

The task about the inputs used in HH aimed to assessing the knowledge of students about

the soap, water and antiseptics used in this practice. All means were close to the maximum value. The dispersion indicated by the SD and VCP was small enough to indicate the mean as a representative value for the adjustment of students, which demonstrates basic knowledge as to the inputs necessary to the practice of HH.

However, there are still doubts about the usefulness of these products. According to the recommendations of the Ministry of Health<sup>(9)</sup>, in addition to alcohols, chlorhexidine and iodophor are among the main antiseptics used

for antiseptic hand hygiene as they reduce the transient and resident microbiota.

With regard to the use of alcohol 70% was aimed to know the student's understanding as to their efficiency, effectiveness and prompt. The maximum and minimum indicate that

there were students who had answered all questions, as well as students who did not hit any of the same item, which reflected in the SD and the VCP, being the highest of all questions, since that was the one that got a high rate of errors.

**Table 3** - Distribution of participants according to the resources used in HH. São Carlos (SP) - Brazil, 2011.

	Course	Maximum	Minimum	Average	Mode	SD	VPC (%)
<b>Inputs used for HH</b>	Nursing	4	2	3,68	4	0,54	14,67
	Physiotherapy	4	2	3,21	3	0,70	21,81
	Medicine	4	2	3,56	4	0,63	17,70
	Occupational Therapy	4	1	3,23	4	0,79	24,46
<b>Use of alcohol at 70%</b>	Nursing	4	0	2,78	4	1,1	40,07
	Physiotherapy	4	0	2,18	3	1,04	47,71
	Medicine	4	0	2,38	3	1,02	42,86
	Occupational Therapy	4	0	2,29	3	0,94	41,05
<b>Drying of the hands</b>	Nursing	4	2	3,39	3	0,58	17,11
	Physiotherapy	4	1	3	3	0,71	23,67
	Medicine	4	0	2,56	3	1,03	40,23
	Occupational Therapy	4	1	2,67	3	0,76	28,46

HH with alcoholic preparation is as efficient as simple handwashing, but is indicated when hands are not visibly soiled<sup>(9)</sup>. Its use has been associated in the literature with a way to increase adherence of health professionals to HH since the implementation of this practice requires less time<sup>(14)</sup>.

Considering the significant number of errors facing the use of alcohol at 70%, there is evidence that some points related to its use have not been fully clarified.

In order to regularize the use of alcohol, ANVISA published a Board Resolution (RDC) No. 42 of 25 October 2010, which deals with

the obligation of health services in the alcoholic preparation for HH available<sup>(12)</sup>.

The other issue addressed relevant to drying hands after HH aspects. The most frequent number of hits is more than 50%. And while in all courses some students agreed fully, minimal arrangements varied. This condition interfered with the variation of SD and VCP, demonstrating that in this regard also some issues need further clarification.

In table 4 there are data on major weaknesses found from the items with the highest error rate of the questionnaires.

**Table 4** - Distribution of participants' knowledge on weaknesses according to the percentage of errors made. São Carlos (SP) - Brazil, 2011.

Course	Minimization of risk of contamination by biological material from MH%	Alcohol at 70% complementary to HH in soapy water%	Recommendation of degermante solution for simple HH%	Recommendations of electric Dryers for drying hands %	Inadequate employment of substances for HH %	Inappropriate recommendations related to HH %
Nursing	47,03	50	93,55	56,45	27,42	8,06
Physiotherapy	54,38	98,24	98,25	70,18	31,57	3,51
Medicine	62,50	68,75	93,75	87,50	25	6,25
Occupational Therapy	68,97	88,51	94,25	73,56	37,93	6,9

Among the items with the highest percentage of errors is the negation of students that HH decreases the likelihood of professional defile after contact with biological material. The lack of knowledge question can provide the trivialization of hygiene, since the professional unaware of this technique as a factor of self-protection.

With respect to recommendations related to inadequate HH, some students of physiotherapy and occupational therapy indicated that it should be taken after care only when the risk of infection is evident. In the literature found that greater adherence to procedures with HH were those where it was possible to observe occupational risk, which may have motivated sanitization<sup>(15)</sup>.

Thus, it is observed that there is a perception that the HH is recommended only for situations where the risks are evident, however, it is believed that this is a measure that should be used by all assists, independent of knowledge of the professionals healthcare in existence or not of infection in the patient.

Have some students of nursing and medicine indicated that HH is irrelevant towards the use of gloves, reinforcing the need for greater investment in education<sup>(10)</sup>.

In a study<sup>(16)</sup> identified that 84,4% of the observed punches did not adhere to the HH professionals and gloves, being noted by the authors of the efficiency measures for IRAS prevention.

Parallel to this, when the HH has performed points to professional inattention, since 108 dressings observed in 61,1% no adequate HH. The use of gloves was also not identified in 80% of the observations, while in blood glucose capillary puncture they were used only in 14% of opportunities<sup>(17)</sup>

The item that indicated alcohol as 90% more than the recommended 70% was more marked by students of physiotherapy, occupational therapy and medicine.

By having a fast microbicidal effect and its low tissue irritability, alcohol is among the preferred substances for the HH<sup>(18)</sup>. So that its use

provides the desired effect, the recommended concentration of ethanol is 70%<sup>(9)</sup>.

All students also argued that the 70% alcohol gel should be used only as a supplement to HH with antiseptic soap and water. Ignorance about the undesirability of this practice may contribute to poor adherence to use of alcohol, since the combination of these techniques may cause drying or dermatitis<sup>(9)</sup>.

All courses have a high percentage of error in stating that the germ solution is recommended for simple handwashing. On the other hand, there were nursing students who erred in denying the iodophor and chlorhexidine are the main antiseptics used in antiseptic handwashing.

It is seen that the use of degerming solutions do not correspond to simple indication of hand hygiene, and the high rate of errors in this item, is a matter that might be being underexplored within the graduation of all courses in the health field.

When there is an inadequate utilization of liquid soaps and antiseptics, these can cause damage in the prevention of diseases arising from a poor hand hygiene<sup>(19)</sup>. Thus, it requires clarification on inputs used for HH during graduation, enabling the use responsibly, ensuring safe care and avoiding waste substances.

Students also showed a high percentage of errors when trying to drying hands can be done with electric instead of paper towel dryers, because there is no direct contact with it. Its use was effective in only 55% of the hands of men and 68% of women's hands, while the paper towels had an efficiency of about 93% in both genders<sup>(20)</sup>.

The undesirability of such equipment is related to the fact that the time to be spent for drying cannot be obeyed, by the difficulties that can arise to be fired and the possibility of conducting microorganisms<sup>(9)</sup>. Thus, the use of paper towels for drying hands can not be replaced by the use of electric dryers, their risks should be presented during graduation.

## FINAL CONSIDERATIONS

There is no great difference in the amount of hits between courses there, demonstrating adequate knowledge about the subject, which resulted in an average above 75% accuracy for all courses.

There is understanding on the topic by the HH undergraduates, one should address more widely inputs and substances used in this practice, making the assistance of safer healthcare for both patients and for professionals.

Whereas in serving the customers, there is still a gap between knowing and doing. It is essential that during the process of professional education the importance of adhering to the HH is widely discussed and demonstrated through scientific articles and observation of clinical practice. More than the

awareness of the student, the teacher must also adhere to the HH in opportune times to act as an example and encourage the practice.

It is hoped that this work can make opportune a moment for reflection of the teachers and students about the importance of correct technique and HH and concepts of patient safety.

## ACKNOWLEDGEMENTS

We thank the departments of all courses involved in the research, cooperating with its development, to the Foundation for Research Support of the State of São Paulo (FAPESP) for funding given to nurses and Maria Clara Padoveze and Mellina Yamamura, who contributed to the preparation the questionnaire.

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## SEGURANÇA DO PACIENTE: CONHECIMENTO DOS ESTUDANTES DA ÁREA DA SAÚDE SOBRE A HIGIENIZAÇÃO DAS MÃOS

### RESUMO

Várias são as razões para a ocorrência das infecções relacionadas à assistência à saúde e suas consequências influenciam no tempo de tratamento e no prognóstico do paciente. Sendo a higienização das mãos um método eficiente e econômico para prevenir a transmissão de microrganismos, este estudo objetivou identificar o conhecimento de estudantes da área da saúde da Universidade Federal de São Carlos (UFSCar) sobre a higienização das mãos, dentro do conceito de segurança do paciente. Utilizando uma abordagem quantitativa, foram aplicados 222 questionários estruturados aos alunos de enfermagem, fisioterapia, medicina e terapia ocupacional, sendo os dados analisados a partir da estatística descritiva. No total de acertos do questionário todos os cursos atingiram pontuação maior que 75%. As fragilidades no conhecimento identificadas relacionavam-se à higienização das mãos como um método de proteção à aquisição de infecções; ao uso e recomendação adequada do álcool a 70% e de soluções degermantes; e à não recomendação do uso de secadores elétricos. Observou-se que os graduandos consolidaram conhecimentos básicos sobre a temática durante a graduação. Entretanto, as fragilidades encontradas podem comprometer a segurança do paciente e do profissional, sendo necessária maior abordagem sobre essa temática durante a formação acadêmica.

**Palavras-chave:** Lavagem de mãos. Exposição a agentes biológicos. Conhecimento. Estudantes de ciências da saúde. Segurança do paciente.

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## LA SEGURIDAD DEL PACIENTE: CONOCIMIENTOS DE LOS ESTUDIANTES DE SALUD ACERCA DE LA HIGIENE DE LAS MANOS

### RESUMEN

Muchas son las razones para la ocurrencia de infecciones relacionadas con el cuidado de la salud y sus consecuencias afectan en el tiempo de tratamiento y en el pronóstico del paciente. Siendo la higiene de las manos un método eficiente y económico para prevenir la transmisión de microorganismos, este estudio tuvo como objetivo identificar el conocimiento de los estudiantes en el área de la salud de la Universidad Federal de São Carlos (UFSCar) acerca de la higiene de las manos, en el concepto de seguridad del paciente. Se utilizó método de enfoque cuantitativo y se aplicó 222 cuestionarios estructurados a los estudiantes de enfermería, fisioterapia, terapia ocupacional y medicina; siendo los datos analizados utilizando estadística descriptiva. Los cursos alcanzaron puntuación mayor que 75%. Las deficiencias de conocimientos identificados estaban relacionadas con: higiene de las manos como método de protección contra la adquisición de la infección; el uso y recomendación de alcohol al 70% y de soluciones degermantes; y la inconveniencia de usar secadoras eléctricas. Se observó que los alumnos han consolidado los conocimientos básicos acerca del tema durante la graduación. Sin embargo, las debilidades encontradas podrían comprometer la seguridad del paciente y profesional, que exige mayor enfoque sobre este tema durante la formación académica.

**Palabras clave:** Lavado de manos. Exposición a agentes biológicos. Conocimiento. Estudiantes del área de la salud. Seguridad del paciente.

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**Submitted: 12/11/2012**

**Accepted: 11/03/2014**