

Evaluation of the handwashing technique held by students from the nursing graduation course*

AVALIAÇÃO DA TÉCNICA DE LAVAGEM DAS MÃOS EXECUTADA POR ALUNOS DO CURSO DE GRADUAÇÃO EM ENFERMAGEM

EVALUACIÓN DE LOS ALUMNOS DEL CURSO DE GRADUACIÓN DE ENFERMERÍA DE LA TÉCNICA DE LAVADO DE MANOS

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ABSTRACT

The purpose of this study was to compare the execution and verify the compliance with the handwashing techniques by students in an undergraduate Nursing course. The study was performed with 113 students enrolled in internship programs in healthcare institutions in the city of São Paulo. Data collection occurred through direct observation, using a check-list instrument with the steps of the technique. Students in their 2nd and 3rd year had better results in most steps of the technique, with a statistically significant difference when compared to the 4th year. Compliance with the steps of the technique by the students was very low, since their compliance with half the handwashing steps was lower than 50%. The average amount of students who executed all the steps of the technique correctly was very low, 8.8%. The observed students did not execute the handwashing techniques according to the recommendations.

KEY WORDS

Handwashing.
Infection control.
Education, nursing.

RESUMO

O objetivo deste estudo foi comparar a execução e verificar a adesão à técnica de lavagem das mãos por alunos de um Curso de Graduação em Enfermagem. A pesquisa foi realizada com 113 alunos que estavam cumprindo estágio em instituições de saúde do município de São Paulo. Os dados foram coletados por observação direta utilizando um instrumento em forma de *check-list* com os passos da técnica. Os alunos do 2º e 3º ano obtiveram melhor desempenho na maioria dos passos na execução da técnica, com diferença estatisticamente significativa, quando comparados ao 4º ano. A adesão aos passos da técnica pelos alunos foi muito baixa, pois apresentaram adesão menor que 50% em metade dos passos. A média de alunos que executou todos os passos da técnica corretamente foi muito baixa, 8,8%. Os alunos observados não realizaram a técnica de lavagem das mãos conforme recomendado.

DESCRIPTORES

Lavagem de mãos.
Controle de infecções.
Educação em enfermagem.

RESUMEN

El objetivo de este estudio fue comparar la ejecución y verificar la adhesión a la técnica de lavado de las manos por alumnos de un Curso de Graduación en Enfermería. La investigación fue realizada con 113 alumnos que estaban realizando una práctica en instituciones de salud del municipio de San Pablo. Los datos fueron recolectados por observación directa utilizando un instrumento en forma de *check-list* con los pasos de la técnica. Los alumnos del 2º y 3º año obtuvieron un mejor desempeño en la mayoría de los pasos en la ejecución de la técnica, con una diferencia estadísticamente significativa, cuando comparados al 4º año. La adhesión a los pasos de la técnica por los alumnos fue muy baja, ya que presentaron una adhesión menor que 50% en la mitad de los pasos. El promedio de los alumnos que ejecutaron todos los pasos de la técnica correctamente fue muy baja, 8,8%. Los alumnos observados no realizaron la técnica de lavado de las manos conforme recomendado.

DESCRIPTORES

Lavado de manos.
Control de infecciones.
Educación en enfermería.

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INTRODUCTION

Hospital infections happen for many reasons and a number of mechanisms favor their occurrence. One of them is microorganism transmission by health professionals, who act as direct or indirect vectors in the transmission of pathogenic microorganisms to vulnerable patients. It is believed that one third of these infections can be prevented with infection control measures, one of which is adequate hand hygiene⁽¹⁾.

Hand washing is the most efficient and economical method to prevent nosocomial infections; and this is a well known fact throughout the world⁽²⁻⁴⁾. After all, hands are the main transmission means for hospital infections and their washing should be conducted before and after any patient care procedure^(2,5-7).

In 1989, the Brazilian Health Ministry edited the *Hand washing* manual, aiming to standardize this technique in Brazilian health units, offering health professionals with technical substance related to standards and procedures to wash hands, aiming at the prevention of hospital infections⁽⁵⁾. The importance of this practice was also recognized by the Health Ministry when it included recommendations for hand hygiene in regulation 2616/98, May 12th, 1998⁽⁸⁾.

In 2001, to encourage health professionals to support hand washing, ANVISA (The National Health Surveillance Agency) launched the *Hand washing – A small gesture, a big attitude* campaign on May 15th, which is the National Day for Hospital Infection Control⁽⁹⁾.

Although acknowledged as the most important preventive measure to reduce microorganism transmission by contact, many studies show that health professionals' support for hand hygiene practice is very unsatisfactory^(1,10-11).

The teaching-learning process of the techniques in the Nursing undergraduate course at the University of São Paulo School of Nursing (EEUSP) generally starts with an exposition class, where the student gets to know the scientific principles of a chosen nursing technique and the steps that should be followed. Afterwards, there is a technical demonstration in a laboratory, conducted by a professor or nurse. Following that, students are asked to perform the technique and the professor or instructor makes corrections when necessary. Finally, the students perform the technique in direct patient care, in other words, in real conditions⁽¹²⁾.

At EEUSP, the hand washing technique is one of the first procedures students learn, during a theoretical class with text discussion, conducted by the instructor. Shortly after, the student is sent to the Nursing Procedures Laboratory, where the technique is performed by the student and the instructor or nurse makes the necessary corrections.

Knowing the importance of hand washing for health professionals' practice and our responsibility in training our students, our future professionals, we proposed this study to evaluate nursing students' performance when performing hand washing in the different periods of their undergraduate program.

OBJECTIVE

The purpose of this study was to compare the execution and verify compliance with the hand washing technique by students in the second, third and fourth periods of an undergraduate nursing course.

METHOD

This investigation is a cross-sectional comparative quantitative non-experimental study.

The sample comprised students from the EEUSP undergraduate nursing course, in the 2nd, 3rd and 4th periods, in 2006, who agreed to participate in the study.

At EEUSP, the hand washing technique is taught when the students are in the second semester of the undergraduate nursing course, before they start any internship. Moreover, during the whole course, the students have classes about a number of nursing procedures and hand washing is also addressed as a mandatory technique before and after any procedure.

Data collection was performed from June 19th until November 17th, 2006, during the students' internship in a secondary-level teaching hospital and in Basic Health Units (BHUs) in the city of São Paulo, which consisted of technical observation of the students' hand washing during their internship, according to the availability of the researcher. For each student, only one observation was conducted. In the period of July until September there was no data collection, since the students were not going through any internship programs.

A tool was designed with the steps for hand washing in the form of a *check list*, based on the Health Ministry recommendations⁽⁵⁾. Two nurses helped the researcher during the data collection stage. These nurses received proper training in order to deeply know the *check list*, as well as its use during the collection. The students' observation was conducted, simultaneously, by two people, the researcher and one of the nurses.

The ethical norms were followed and the project was approved by the research ethics committee and the EEUSP research committee (File #512/05).

The data was stored in a database designed using Microsoft Excel[®] and later transferred to the Statistical Pack-

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age for Social Sciences (SPSS)[®] 10.0 for Windows[®]. The analysis was conducted by means of descriptive and inferential statistics, using the following tests: Pearson's Chi-Square test, Fisher's Exact test, Kolmogorov-Smirnov, MannWhitney and the non-parametric Kruskal-Wallis test.

RESULTS AND DISCUSSION

In total, 113 students, from the 2nd, 3rd and 4th years were observed, including 34, 42, and 37 students, respectively. The sample comprised 44.1% of the total number of students enrolled in the 2nd year, 51.2% of third-year students and 48.0% of fourth-year students. Data will be presented in a descriptive way, by charts or graphs.

This study concluded that 50% of the students carried out the hand washing procedure before and after conducting a procedure, in other words, complying with the recommendations by the Brazilian Health Ministry and USA CDC,

i.e. 42.4% of the students washed hands only after procedures and 6.5% of the total carried out the technique only before conducting any procedure. There was a statistically significant association, $p=0.001$, among the different course years, measured by Fisher's exact test, and this association happened between the 2nd and 4th years and between the 3rd and 4th years. In both cases, the proportion of fourth-year students conducting the steps before and after the procedure is lower when compared to the 2nd and 3rd years.

The proportion of fourth-year students who conducted the steps before and after the procedure was very low, 12.5%, when compared to the second and third years, with 82.1% and 59.4%, respectively. It was observed that compliance with this item diminished as students advanced in the course.

A hand washing study in a neonatal ICU noted that 56.9% of the health professionals did not wash their hands before a procedure and that 36.9% did not wash hands after it⁽¹¹⁾.

Table 1 - Distribution of compliance with the steps that compose the hand washing technique in the different course years - São Paulo - 2007

TECHNIQUE STEP		COURSE YEAR						TOTAL		p-value*
		2 nd		3 rd		4 th		N	%	
		N	%	N	%	N	%	N	%	
Removed jewelry	YES	7	20.6	23	54.8	10	27.0	40	35.4	0.004
	NO	27	79.4	19	45.2	27	73.0	73	64.6	
Wet their hands	YES	34	100.0	42	100.0	35	100.0	111	100.0	0.306
	NO	-	-	-	-	-	-	-	-	
Used soap/ alcohol	YES	34	100.0	42	100.0	37	100.0	113	100.0	0.301
	NO	-	-	-	-	-	-	-	-	
Scrubbed their palms	YES	27	79.4	32	76.2	29	78.4	88	77.9	0.960
	NO	7	20.6	10	23.8	8	21.6	25	22.1	
Scrubbed the back of their hands	YES	17	50.0	23	54.8	7	18.9	47	41.6	0.002
	NO	17	50.0	19	45.2	30	81.1	66	58.4	
Scrubbed between their fingers	YES	15	44.1	21	50.0	2	5.4	38	33.6	0.001
	NO	19	55.9	21	50.0	35	94.6	75	66.4	
Scrubbed their thumbs	YES	16	47.1	21	50.0	8	21.6	45	39.8	0.019
	NO	18	52.9	21	50.0	29	78.4	68	60.2	
Scrubbed their fingernails	YES	16	47.1	17	41.5	5	13.5	38	33.9	0.005
	NO	18	52.9	25	58.5	32	86.5	75	66.1	
Rinsed hands	YES	34	100.0	42	100.0	35	100.0	111	100.0	1.000
	NO	-	-	-	-	-	-	-	-	
Used paper towel	YES	34	100.0	42	100.0	34	97.1	110	100.0	0.622
	NO	-	-	-	-	1	2.9	1	0.9	
Closed the faucet with paper towel	YES	14	41.2	22	52.4	29	82.9	65	58.6	0.001
	NO	20	58.8	20	47.6	6	17.1	46	41.4	

*To determine if there was a significant statistical difference among students of different course years in the items that compose the hand washing technique, Pearson's chi-square test was used.

The data in Table 1 shows that most sample students (64.6%) did not remove their adornments (watch, bracelets or rings) before washing their hands. There was a significant statistical difference between the years, and they happened between the 2nd and 3rd years and between the 3rd and 4th years. The third year presented a better performance in comparison to the 2nd and 4th years. Between

the 2nd and the 4th years, there was no significant statistical difference.

A study about evaluating the health professional's hand washing technique concluded that 84.0% of the observed health professionals did not remove their jewelry when washing their hands⁽¹³⁾.

Another study performed with 50 nurses working in surgical-medical units showed that skin under the rings is much more colonized by bacteria when compared to finger skin without this adornment. In this study, it was concluded that 40.0% of the nurses carried gram-negative bacillus, for example *Klebsiella* and *Acinetobacter*, in the skin under their rings and that these professionals certainly carried these microorganisms for months⁽¹⁴⁾. In spite of this data, it is still unknown if there is a direct relation between wearing jewelry and a raise in pathogen transmission⁽²⁾.

Students reported an average of 33.6% when it came to washing fingernails, with the 2nd and 3rd years presenting a small difference, 47.1% and 41.5% respectively, and a large difference in relation to the fourth year, which scored much lower than the others (13.5%).

Some studies documented that subungual areas of the hand have a high concentration of bacteria, mostly *Staphylococcus sp* coagulase-negative, *Pseudomonas sp* and *Corynebacterium spp*⁽¹⁵⁾. The study about the use of antimicrobial soap or gel alcohol in hand hygiene concluded that there is frequently a substantial number of pathogens in subungual spaces, even after careful hand washing, with the use of surgical brushes⁽¹⁶⁾.

A total of 58.6% of the students used a paper towel to close the faucet. The 4th year presented a big difference in relation to the other years, 82.9%. The 2nd and 3rd years presented values of 41.2% and 52.4%, respectively. The Brazilian Health⁽⁵⁾ and the USA CDC⁽²⁾ recommend the use of the paper towel that was used to dry the hands as a barrier to close the faucet, avoiding hand recontamination.

Studies in an IC unit evaluated the health professional's compliance with the hand washing technique. In a first moment, the professionals were observed and it was noted that only 5% of them closed the faucet without contaminating their hands in a total of 525 observations. In a later moment, educational programs were conducted and it was noted that the number of professionals who did not contaminate their hands rose to 100% in a total of 355 observations⁽¹⁷⁾.

The average number of students who conducted all technique steps correctly was very low, only 8.8%, and none of the students from the fourth year conducted the hand washing technique with all correct steps, as shown in Figure 1. The 2nd year presented the best rate 17.6% and the 3rd year, 9.5% (Figure 1).

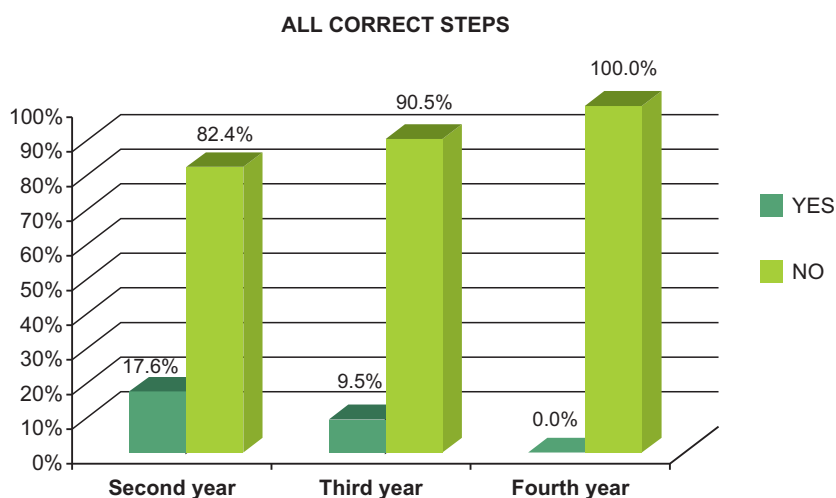


Figure 1 - Proportion of students who conducted the steps correctly - São Paulo - 2007

Studies about the health professionals' hand washing technique showed similar results, with only 14% of the evaluated health professionals complying with all of the technique steps correctly⁽¹³⁾.

Generally, the second and third years presented a better performance of the hand washing technique, with significant statistical differences when compared to the fourth year.

When analyzing the data, an attempt was made to understand why the fourth year had a worse performance when it came to the hand washing technique. We believe this may have happened because there was a large period of time since they had the classes and demonstrations on

the Nursing Laboratory. Another factor that may have influenced the outcome is that these students are in teaching institutions' internships for longer. Many articles evidence the low compliance with the hand washing technique by health professionals, sometimes related to their beliefs and myths⁽¹⁸⁾, and maybe the students were influenced by this organizational behavior.

Another reason would be the fact that the fourth year students have a higher *freedom* to execute their internship duties, since their internships are not supervised full time, as is the case with the second and third years, which have more direct professor/nurse supervision.

CONCLUSIONS

As for the comparison among the groups of students from the different years in relation to each step of the hand washing technique, it was concluded that the students from the second and third years presented a better performance, with significant statistical differences, when compared to the fourth-year students, and the students' compliance rate to the steps of the hand washing technique was low throughout all years.

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ANNEX

DATA COLLECTION TOOL
Handwashing Technique

1.0 – Student identification

Student name: _____ Date: ____/____/____ Age: ____ years

Gender: () F () M Year: 2nd () 3rd () 4th () Unit where the student was observed _____

Moment/situations in which the student washed his/her hands:

Personal hygiene :

A) When entering the unit

To perform non-invasive care:

B) Before preparing the medication.

C) After preparing the medication.

D) Before making a physical examination.

E) After making a physical examination.

F) Before cleaning and changing the patients' clothes.

G) After cleaning and changing the patients' clothes.

H) After making the bed.

I) Before performing a different activity on the same patient.

J) Before handling material and equipment.

L) After handling material and equipment.

Before invasive procedures:

M) Before a venous puncture.

N) After a venous puncture.

O) Before administrating parenteral medication.

P) After administrating parenteral medication.

Q) Before intravesical catheterization.

R) Before intravesical catheterization.

S) Before making a wound dressing.

T) After making a wound dressing.

U) Before performing tracheal aspiration.

V) After performing tracheal aspiration.

X) Before performing blood glucose measurements.

Z) After performing blood glucose measurements.

Started: _____

2.0 - Handwashing technique	Yes	No
1 - Remove jewelry, bracelets, and watches to wash hands.		
2 - Wet hands.		
3 - Use soap or gel alcohol.		
4 - Scrub palm-with-palm.		
5 - Scrub palm-with-back of hand.		
6 - Scrub between their fingers.		
7 - Scrub their thumb.		
8 - Scrub their nails.		
9 - Rinse their hands.		
10 - Use paper towel.		
11 - Close the faucet using a paper towel.		

Finished: _____

Time spent on the procedure: _____

Researcher

Nurse
