Global Academic Nursing Journal

ORIGINAL ARTICLE

Assessment of hand hygiene technique and its relationship to patient safety

Evaluación de la técnica de higiene de manos y su relación con la seguridad del paciente

Avaliação da técnica de higienização das mãos e sua relação com segurança do paciente

Andressa Theodoro Marques[1]
ORCID: 0000-0002-8000-3898
Ronilson Gonçalves Rocha[1]
ORCID: 0000-0003-4097-8786
Thayanne Gama de Marins[2]
ORCID: 0000-0001-5593-3017
Joyce Martins Arimatéa Branco Tavares[1]
ORCID: 0000-0002-7014-4654
Luana Ferreira de Almeida[1]
ORCID: 0000-0001-8433-4160
Eric Rosa Pereira[3]
ORCID: 0000-0003-0202-6653
Cristiano Bertolossi Marta[1]
ORCID: 0000-0002-0635-7970

[1]Universidade do Estado do Rio de Janeiro. Rio de Janeiro, Brazil.
[2]Pronto Socorro Central de São Gonçalo. Rio de Janeiro, Brazil.
[3]Fundação Técnico Educacional Souza Marques. Rio de Janeiro, Brazil.

How to cite this article:
Marques AT, Rocha RG, Marins TG, Tavares JMAB, Almeida LF, Pereira ER, Marta CB. Assessment of hand hygiene technique and its relationship to patient safety. Glob Acad Nurs. 2021;2(Sup.4):e206. https://dx.doi.org/10.5935/2675-5602.20200206

Corresponding author:
Cristiano Bertolossi Marta
E-mail: cristianobertol2014@gmail.com

Submission: 02-17-2021
Approval: 03-20-2021

Abstract

The aim of the study is to evaluate how the hand hygiene procedure is performed by nursing residents, nursing students and patient caregivers. This is a descriptive observational study, with a quantitative approach, with a non-probabilistic type of sampling, developed in a university hospital. The study included 90 participants distributed as (G1: 30 residents; G2: 30 academics; G3: 30 companions). The results showed that G2 had the longest time in seconds of hand hygiene compared to the other groups, with a time of 122 seconds. As for the removal of adornments, 29(96.5%) from G1 and 100% from G2 did so, against 22(73.4%) from G3. 29 (96.5%) of G1, 100% of G2 used soap and water and 4 (13.4%) of G3 did not use it. The content deposited in the hands of the participants was visible in 19 (63.3%) of G1; 27(90.0%) from G2; 25 (86.3%) of G3. From the results found, failures were observed in the step-by-step hand hygiene technique and despite the understanding of the procedure by G1 and G2 in relation to G3, the result showed that none of the groups correctly followed the techniques of the procedure, evidencing check the presence of traces of contamination on your hands.

Descriptors: Hand Hygiene; Patient Safety; Nursing; Hand Disinfection; Students, Nursing.

Resumén

El objetivo del estudio es evaluar cómo el procedimiento de higiene de manos es realizado por residentes de enfermería, estudiantes de enfermería y cuidadores de pacientes. Se trata de un estudio observacional descriptivo, con abordaje cuantitativo, con muestreo de tipo no probabilístico, desarrollado en un hospital universitario. El estudio incluyó a 90 participantes distribuidos como (G1: 30 residentes; G2: 30 académicos; G3: 30 acompañantes). Los resultados mostraron que G2 tuvo el mayor tiempo en segundos de higiene de manos en comparación con los otros grupos, con un tiempo de 122 segundos. En cuanto a la eliminación de adornos, 29 (96,5%) de G1 y 100% de G2 lo hicieron, frente a 22 (73,4%) de G3. 29 (96,5%) de G1, 100% de G2 utilizaron agua y jabón y 4 (13,4%) de G3 no la utilizaron. El contenido depositado en manos de los participantes fue visible en 19 (63,3%) de G1; 27 (90,0%) de G2; 25 (86,3%) de G3. A partir de los resultados encontrados, se observaron fallas en la técnica de higiene de manos paso a paso y a pesar de la comprensión del procedimiento por parte de G1 y G2 en relación a G3, el resultado mostró que ninguno de los grupos siguió correctamente las técnicas del procedimiento. comprobando la presencia de rastros de contaminación en sus manos.

Descriptores: Higiene de las Manos; Seguridad del Paciente; Enfermería; Desinfección de las Manos; Estudiantes de Enfermería.

Resumo

O objetivo do estudo é avaliar como o procedimento higienização das mãos é realizado por residentes de enfermagem, acadêmicos de enfermagem e acompanhantes de pacientes. Trata-se de estudo observacional descritivo, com abordagem quantitativa, com o tipo de amostragem não probabilística, desenvolvido em um hospital universitário. Fizeram parte do estudo 90 participantes distribuídos como (G1: 30 residentes; G2: 30 acadêmicos; G3: 30 acompanhantes). Os resultados apontaram que o G2 apresentou o maior tempo em segundos de higienização das mãos comparado aos outros grupos, sendo seu tempo de 122 segundos. Quanto a retirada de adornos 29(96,5¨%) do G1 e 100% do G2 o fizeram, contra 22(73,4%) do G3. 29(96,5%) do G1, 100% do G2 utilizaram água e sabão e 4(13,4%) do G3 não fizeram uso. O conteúdo depositado nas mãos dos participantes encontrava-se visível em 19(63,3%) do G1; 27(90,0%) do G2; 25(86,3%) do G3. A partir dos resultados encontrados, observaram-se falhas no passo a passo da técnica de higienização das mãos e apesar do entendimento do procedimento pelo G1 e G2 em relação ao G3, o resultado demonstrou que nenhum dos grupos seguiram corretamente as técnicas do procedimento, evidenciando-se a presença de vestígios de contaminação em suas mãos.

Descritores: Higiene das Mãos; Segurança do Paciente; Enfermagem; Desinfecção das Mãos; Estudantes de Enfermagem.

Introduction

Almost two centuries ago, two important personalities in the health area proved that reducing the mortality rate from nosocomial infections was something possible through simple hygiene measures.

The Hungarian physician Ignaz Philipp Semmelweis in 1847 inferred that the puerperal fever that affected most women was caused by "corpse particles" transmitted from the autopsy room to the obstetric ward through the hands of students and doctors[1].

The following year, it instituted Hand Hygienization (HH) with chlorinated water for all examiners, before touching the parturient, thus contributing to a significant drop in maternal mortality, with a reduction from 12.2% to 1.2% for puerperal fever[1].

Florence Nightingale, English nurse, described care procedures related to patients and the environment to reduce the risk of nosocomial infection (NI), pointing out in 1856 an important reduction in the rates of this type of infection by standardizing procedures related to hygiene and cleanliness from hospital. Such standardization of simple measures was responsible for the reduction of HI indices in the order of 42.7% to 2.2% with a consequent decrease in morbidity and mortality[2].

Regarding the epidemiology of care-related infections (HAI) today, one of the most important causes of the spread of microorganisms is the hands of health professionals, who can be a source and vehicle of transmission, in addition to several bodily sites of the same patient, between patients, and reciprocally between these and the care environment[3,4].

Since then, there has been a real revolution in scientific knowledge related to HIs, their combat and their prevention, mainly due to the insertion of new technologies that, naturally and by necessity, were incorporated in the production of antimicrobials[2].

Given the concomitant emergence of multiresistant bacteria, a fact that increased the need for new investments in this area leading to new discoveries such as penicillin in 1928, by Alexander Flemming, and the discovery of sulfonamides by the German Gerhard Domagk during World War II[2].

HAIs are a serious problem at the international level, increasing hospitalization time, morbidity, and mortality, resulting in excessive expenses for the health system and unnecessary suffering for users.

In 2002, the World Health Organization (WHO), with the support of member countries, launched the initiative to discuss patient safety. In 2004, through the World Alliance for Patient Safety program, guidelines and strategies were created to encourage and disseminate practices that ensure patient safety[5].

In Brazil, with the objective of contributing to the qualification of health care, the National Patient Safety Program (PNSP) was instituted in 2013 in all health establishments in the national territory, to implement protocols, patient safety centers and notification of adverse events. The PNSP proposes six patient safety protocols focusing on the most prevalent problems: safe surgery, falls, pressure injuries, safe medication administration, correct patient identification and hand hygiene (HH)[6].

In this study, the problem analyzed is closely related to patient safety in hospital units focused on HH. Hospitalized patients are vulnerable to all types of pathogens, and this fact grows when they receive the care provided by professionals who improperly sanitize their hands[3].

Investigating this theme is important so that health professionals, academics, and caregivers are sensitized, as they are one of the main ways of interrupting the transmission cycle of pathogens, through direct contact between the caregiver, the patient, and the care environment[5].

Through the evaluation of HH carried out by three distinct groups, consisting of residents and nursing students who have gone through disciplines that address the topic of correct hand hygiene and even caregivers of hospitalized patients. It was verified whether the procedure was performed properly, that is, as recommended by the current literature on the subject, as well as by health surveillance agencies.

The general objective was to evaluate how the hand hygiene procedure is performed by caregivers, nursing students and nursing residents. The specific objectives were to identify how the members of each group perform hand hygiene after simulated contamination by germs through the application of anti-allergic paint on their hands and to comparatively discuss the hand hygiene process between groups.

The foundation for infection prevention and control is built on a series of simple, well-established, and proven effective precautions that are the "Standard Precautions" that cover the basic principles of infection prevention and control, which measures should apply to all patients[7].

HH is the mainstay of standard precautions and arguably the most effective measure to prevent and control infections. Thus, the study is justified because it promotes the exploration of a simple procedure, but which remains one of the main causes of the spread of HI throughout the world[7].

And it is plausible for promoting increased knowledge about HH and its correlation with increased patient safety, seeking to present HH standards according to the literature, thus allowing easier access by health professionals and people interested in this theme.

Therefore, this study is relevant for keeping the Brazilian scientific bases updated, as the PNSP defined as a priority the development of research based on scientific evidence with improvements in practice, which aim to institute measures that increase patient safety and the quality of services of health[8].

Although the topic is widely discussed in different areas of health, the number of bibliographic findings available online is limited, thus evidencing a gap in knowledge and its relationship with teaching. In this way, the contribution to the research takes place as, when carrying out the bibliographic search, it will add evidence on the theme[9].

The contribution to care is made directly, as in fact, the study encourages the quality of care offered to the patient in the HH item, both by members of the nursing team and by caregivers, bringing reflection on correct practices to reduce HAI, producing knowledge that can transform the basic principle of care that is HH.

"It is important to implement measures that aim to inform and guide patients, companions and visitors during the time of hospitalization about measures to prevent cross-infection, and the importance of HH". Thus, the study encourages health education in the hospital environment[10].

Methodology

This is a descriptive observational study with a quantitative approach, with a non-probabilistic type of sampling. The collected information was entered and treated in a spreadsheet in the Microsoft Excel® software, simple descriptive statistics were used to explore information such as frequency, mean, mode, median and standard deviation.

In the observational study, the investigator acts merely as a spectator of phenomena or facts, without, however, carrying out any intervention that may interfere with their natural course or outcome, although they may carry out measurements, analyzes and other procedures for data collection[11].

The descriptive study is one that aims only to observe, record, and describe the characteristics of a certain phenomenon that occurred in a sample or population, without, however, analyzing the merit of its content[12].

Quantitative research is conceptualized in empirical evidence, where it is based on objective reality and logical thinking, on statistical procedures and on the measurable attributes of human experience[13].

The type of non-probabilistic sampling does not allow generalizing the results to the population, as this type of sampling does not guarantee the representativeness of the population. The main characteristic of non-probabilistic sampling techniques is that, not using random forms of selection, it is impossible to apply statistical formulas to calculate sample errors, for example[14].

The study was carried out at a university hospital, located in the city of Rio de Janeiro, in the nephrology ward, in a children's dialysis room, which served as a laboratory for the development of the study, due to the location of the automatic sink in this sector.

Ninety volunteers took part in the study, divided into three groups as follows: 30 patient companions, 30 academics and 30 nursing residents, who agreed to participate by inviting and signing the Informed Consent Term (FICF). These participants being divided into 3 groups, for the step-by-step comparison and evaluation of the HH technique:

- Group 1: Composed of 1st or 2nd year nursing residents. The choice of these participants is justified by the understanding that residents are an instrument of transformation in each sector, as they argue that the residency was able to bring tools that enhance interprofessional work and the integrality of health care, when it comes to care tertiary, in a teaching hospital[15].

- Group 2: Undergraduate student in nursing. It is important to approach undergraduate students so that the knowledge of future professionals about HH can be identified to point out possible gaps and intervene in this learning process, thus mediating the quality of teaching[9].

- Group 3: Patient companion. It is mentioned that the caregivers of patients represent the most important figure in the recovery of their family member, transcending emotional levels, as they are legitimate representatives of the hospitalized person and help in their rehabilitation. This class needs to be valued by the nursing team[16].

Exclusion criteria for the study were all cases in which it was not possible to obtain the informed consent, companions of patients who had knowledge in the health area and potential participants who reported allergy to gouache paint that would be used in the development of the study. Inclusion criteria were:

- For group 1: being a first- or second-year nursing resident.

- For group 2: being an undergraduate nursing student; be attending between the fifth and eighth period.

- For group 3: being a companion without regard to the health area and being over 18 years of age.

Participants were randomly selected and verbally invited to participate in the research by signing the consent form. The members of group 1 and group 3 were found in the wards of the entire hospital, while the members of group 2 were approached and invited to participate in the ward in which they were intern at the time or previously scheduled with a day and time to participate in the study.

To perform the HH technique, it was necessary to have an automatic sink, paper towel, soap, water, gouache paint to simulate hand contamination, a cloth band to blindfold the eyes during the procedure and a timer for counting the time used to perform the procedure. The filling of the data collection instrument was carried out in an observational way, where the HH procedure was evaluated, this was created by the researchers in accordance with the current literature on HH.

Data for this survey were obtained from April to June 2018. During the morning and afternoon period on random days of the week, excluding weekends and holidays. After being approached and invited to participate in the research, the participants were informed about the reason for using the automatic sink and where paper towels and soap were available for the procedure. They were warned about the gouache paint that was deposited on their hands before the eyes were blindfolded, and about the timing of the technique's execution. There was no health education or explanation about the HH technique before the procedure was performed.

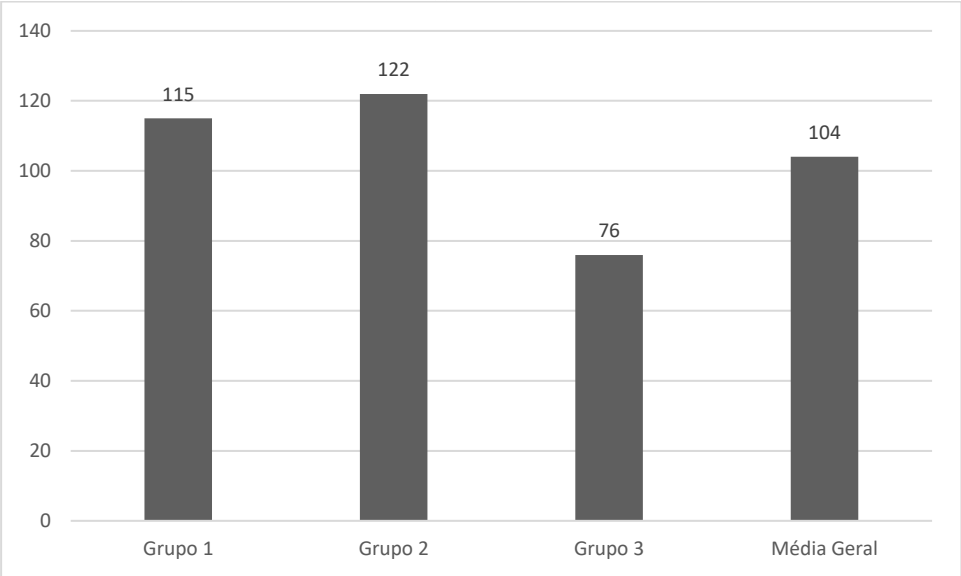
The research project was approved by the Research Ethics Committee of the Pedro Ernesto University Hospital of the State University of Rio de Janeiro, under opinion No. 2,612,079. The principles of bioethics, such as autonomy, non-maleficence, beneficence, justice, and equity were respected, incorporating the individual and the community,

as well as the norms established by Resolution No. 466, of December 12, 2012.

Results

The duration of the HH procedure for each group was initially analyzed and the data obtained generated Graph 1 shown below:

Graph 1. Average time in seconds for hand hygiene. Rio de Janeiro, RJ, Brazil, 2018 (n=90)



According to the graph above, group 1, represented by nursing residents, had an average of 115 seconds for performing the HH procedure, group 2, composed of nursing students, had an average of 122 seconds, in contrast to the group 3, consisting of companions, reached an average of 76 seconds. The general average of the 3 groups is 104 seconds after the procedure.

The data related to the time of completion of the HH allowed the values of the mean, median, mode, standard deviation, and coefficient of variation to be verified in each participating group, individually and together, as shown in Charts 2, 3, 4 and 5 Next:

Chart 1. Time information in seconds for Group 1 HH. Rio de Janeiro, RJ, Brazil, 2018

Mean	Median	Mode	Standard Deviation	Coefficient of Variation
115	108	75	46	0,40

Regarding the HH time in seconds, group 1 has an average of 115 seconds, a median of 108 seconds, the mode of 75 seconds, the standard deviation of 46 seconds and the coefficient of variation of 0.40 seconds.

Chart 2. Time information in seconds for Group 2 HH. Rio de Janeiro, RJ, Brazil, 2018

Mean	Median	Mode	Standard Deviation	Coefficient of Variation
122	112,5	48	60	0,49

In Chart 2, the mean HH time for group 2 is 122 seconds, the median is 112.5 seconds, and mode is 48, 102, 113 seconds. The standard deviation of 60 seconds and the coefficient of variation of 0.49 seconds.

Chart 3. Time information in seconds for Group 3 HH. Rio de Janeiro, RJ, Brazil, 2018

Mean	Median	Mode	Standard Deviation	Coefficient of Variation
76	74	74	24	0,32

Chart 3 informs that the mean HH time for group 3 is 76 seconds, the median is 74 seconds, the following modes: 74, 81, 83. The standard deviation is 24 seconds, and the coefficient of variation is 0.32 seconds.

Chart 4. Time information in seconds for HH for Groups 1, 2 and 3. Rio de Janeiro, RJ, Brazil, 2018

Mean	Median	Mode	Standard Deviation	Coefficient of Variation
104	95	75	50	0,48

Chart 4 deals with the sum of the 3 groups, thus the mean of the groups is 104 seconds for HH, median of 95 seconds, mode of 75 seconds, standard deviation of 50 seconds and coefficient of variation of 0.48 seconds.

The table below shows the distribution of absolute and relative frequency of adherence to the step-by-step that make up the HH technique of the 3 participating groups.

Being the variables; Removal of adornments, use of soap and water, leaning the body over the sink, starting by rubbing the hands, interlacing the fingers, washing the interdigital spaces, rubbing the back of the hand, rubbing the thumbs, rubbing the digital pulps, rubbing the nails, rubbed his fists, contacted the faucet when finished, used a paper towel in the hand-wrist direction and the deposited content is visible.

Table 1. Distribution of the frequency of adherence to the steps that make up the hand hygiene technique, in the different groups observed. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Variáveis		Grupo 1		Grupo 2		Grupo 3		Total	
Passo a passo da técnica	**Sim/Não**	**f**	**%**	**f**	**%**	**f**	**%**	**f**	**%**
Retirou os adornos	Sim	29	96,5	30	100	22	73,4	81	90,0
	Não	01	03,5	-	-	08	26,6	09	10,0
Utilizou água e sabão	Sim	29	96,5	30	100	26	86,6	85	94,4
	Não	01	03,5	-	-	04	13,4	05	05,6
Encostou o corpo sobre a pia	Sim	13	13,4	11	36,6	25	83,3	49	54,4
	Não	17	86,6	19	63,4	05	16,7	41	45,6
Iniciou esfregando as mãos	Sim	29	96,5	28	93,3	25	83,3	82	91,1
	Não	01	03,5	02	06,7	05	16,7	08	08,9
Entrelaçou os dedos	Sim	23	76,6	25	83,3	21	70,0	69	76,6
	Não	07	23,4	05	16,7	09	30,0	21	23,4
Lavou os espaços interdigitais	Sim	13	43,3	17	56,7	10	33,4	40	44,4
	Não	17	56,7	13	43,3	20	66,6	50	55,6
Esfregou o dorso das mãos	Sim	30	100	25	83,3	21	70,0	76	84,4
	Não	-	-	05	16,7	09	30,0	14	15,6
Esfregou os polegares	Sim	24	80,0	26	86,6	09	30,0	59	65,5
	Não	06	20,0	04	13,4	21	70,0	31	34,5
Friccionou as polpas digitais	Sim	18	60,0	21	70,0	06	20,0	45	50,0
	Não	12	40,0	09	30,0	24	80,0	45	50,0
Esfregou as unhas	Sim	24	80,0	22	73,3	04	13,3	50	55,5
	Não	06	20,0	08	26,7	26	86,7	40	44,5
Esfregou os punhos	Sim	26	86,7	23	76,6	16	53,3	65	72,2
	Não	04	13,3	07	23,4	14	46,7	25	27,8
Fez contato com a torneira ao finalizar	Sim	04	13,3	04	13,3	06	20,0	14	15,5
	Não	26	86,7	26	86,7	24	80,0	76	84,5
Utilizou papel toalha na direção mão-punho	Sim	16	53,3	11	36,7	06	20,0	33	36,6
	Não	14	46,7	19	63,3	24	80,0	57	63,4
Conteúdo depositado se encontra visível	Sim	19	63,3	27	90,0	25	86,3	71	78,8
	Não	11	37,7	03	10,0	05	16,7	19	21,2

Aspects such as the use of adornments such as rings, bracelets, watches, among others were also analyzed and the following results were found, distributed by group, the percentages of each group were calculated, according to the removal of adornments, and the results were presented, according to the Table 2 next:

Table 2. Comparison between the groups that removed the ornaments for hand hygiene. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	29	96,5	1	3,5
Group 2	30	100	-	-
Group 3	22	73,4	8	26,6
Total	81	90	9	10

Only 1 participant (3.5%) in group 1 did not remove the adornments for HH and all the participants in group 2 removed the ornaments representing 100% of the sample, in group 3, 8 participants did not remove them, this being about 26.6 % Sample.

Thus, 9 people (10%) did not remove the adornments. In the study, attention was paid to the use of essential products, made available for the performance of HH, such as soap and water, as recommended by Anvisa, mainly due to the participation of caregivers of hospitalized patients, verifying the following results available in Table 3:

Table 3. Comparison between groups that used soap and water for hand hygiene. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	29	96,5	1	3,5
Group 2	30	100	-	-
Group 3	26	86,6	4	13,4
Total	85	94,4	5	5,6

The table above shows that 1 person (3.5%) in group 1 did not use soap and water to perform the procedure. In group 2, 100% of the sample used soap and water. In relation to group 3, 4 people (13.4%) did not use it. In total, 5 did not use it, represented by 5.6% of the total sample.

The 7 people (23.4%) in group 1 did not interlock their fingers at the time of the HH technique. In group 2, it was observed that 5 participants (16.7%) were also in non-compliance with this variable.

In group 3, 9 people did not interlock their fingers, this being 30% of the sample. Thus, 21 people (23.4%) did not undergo the procedure. As we can see in Table 4 below:

Table 4. Comparison between the groups that intertwined their fingers in hand hygiene. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	23	76,6	7	23,4
Group 2	25	83,3	5	16,7
Group 3	21	70,0	9	30,0
Total	69	76,6	21	23,4

In Table 5 below, in relation to the variable rubbing the back of the hands, 30 people from group 1, that is, 100% of the participants did it. In group 2, 5 people (16.7%) did not perform this step. 9 participants in group 3 (30%) did not rub the back of their hands. Of the sample of 90 people, 14 (15.6%) did not perform this variable.

Table 5. Comparison between groups that rubbed the back of their hands with their fingers. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	30	100,0	-	-
Group 2	25	83,3	5	16,7
Group 3	21	70,0	9	30,0
Total	76	84,4	14	15,6

Table 6. Comparison between groups that rubbed their fists. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	26	86,7	04	13,3
Group 2	24	80,0	06	20,0
Group 3	16	53,3	14	46,7
Total	66	73,3	24	26,7

Table 6 above informs that 4 people (13.3%) did not rub their wrists. In group 2, 6 participants (20%) did not perform this variable, compared to group 3, 14 people (46.7%) did not adhere to this step of the technique. In total,

24 participants (26.7%) did not rub their wrists during the procedure.

Regarding the variable rubbing the nails, 6 participants in group 1 (20%) did not adhere to this step. 8 participants (26.7%) from group 2 performed this step of the technique. In group 3, only 26 people (86.7%) did not rub their nails. 40 (44.5%) of the total of people did not perform the step.

Table 7. Comparison between groups that rubbed their nails in hand hygiene. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	24	80,0	06	20,0
Group 2	22	73,3	08	26,7
Group 3	04	13,3	26	86,7
Total	50	55,5	40	44,5

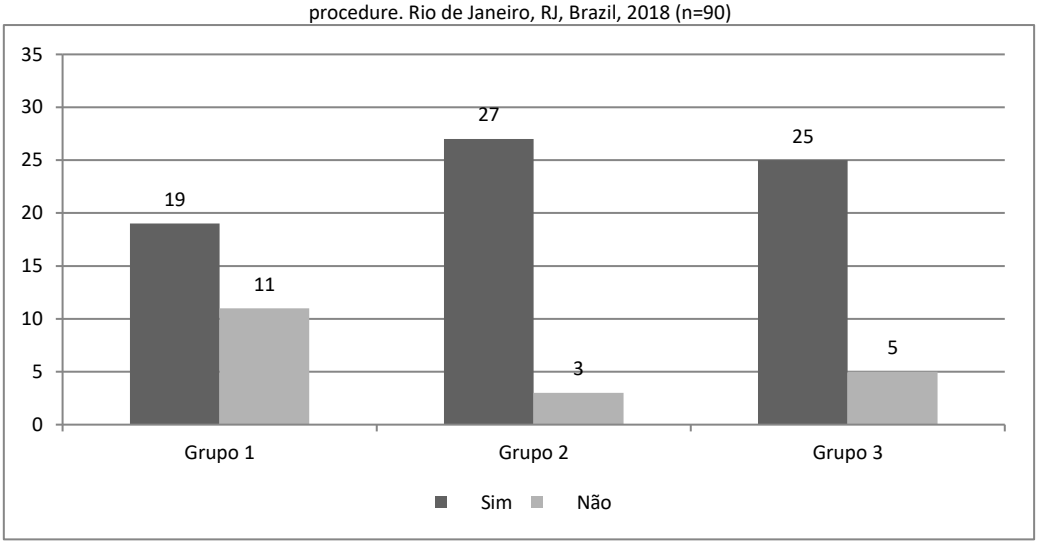
The 14 participants (20%) in group 1 did not use the paper towel in the hand-wrist feeling. 19 participants (63.3%) from group 2 did not dry their hands in the correct direction. In group 3, 24 participants (86.7%) did not use the paper in the hand-wrist direction. Thus, 57 people (63.4%) did not dry their hands in the correct direction after the HH procedure. As we can see in table 8 below:

Table 8. Comparison between groups that used paper towels in the hand-wrist direction. Rio de Janeiro, RJ, Brazil, 2018 (n=90)

Group	Yes (f)	%	No (f)	%
Group 1	16	80,0	14	20,0
Group 2	11	36,7	19	63,3
Group 3	06	13,3	24	86,7
Total	33	36,6	57	63,4

Regarding the deposited content that remained visible in the hands of the participants at the end of the procedure, 19 members of group 1 had traces of gouache paint deposited on their hands. In the second group, 27 participants had content deposited in their hands. In group 3, there were 25 participants with gouache paint on their hands. As we can see in Graph 2 below:

Graph 2. Number of participants in which the content deposited in their hands was visible after the procedure. Rio de Janeiro, RJ, Brazil, 2018 (n=90)



Discussion

The information observed in Graph 1 allows us to state that group 2 is the group with the highest average in relation to HH time and group 3 is the group with the lowest average, which demonstrates that students follow the cleaning technique with more proximity, however, occurring over a longer period.

Still regarding the discussion of data related to time, analyzing the Median, shown in table 2, it means that 50% of the participants in group 1 take 108 seconds or more to perform the HH. In the interpretation of Fashion for this group, the most frequent HH time is 75 seconds (only two people repeated the same time). And the Standard Deviation shown (46 seconds) indicates that the results varied a lot

around the mean. This means that, in general, a good part of the sample, sanitizes hands with a speed between 69 seconds and 161 seconds.

Regarding Table 3, the interpretation of the Median allows us to inform that 50% of the people in group 2 take 112.5 seconds or more to perform the HH. In the interpretation of Fashion, it is possible to state that the most frequent time of HH is 48; 102 and 113 seconds (has 3 modes with two participants repeating the same time each). And in the interpretation of the Standard Deviation that was 60 seconds. This shows that, in general, a good part of the sample HH with a speed between 62 seconds and 182 seconds.

The data resulting from a comparative study between nursing students and medical students, in relation to the HH technique, shows that nursing students showed better performance in this procedure compared to medical students. This data is relevant for the present research, since the numbers obtained show that nursing students perform HH in a time closer to the appropriate one when compared to other groups and make partial or total use of the technique[17].

And with respect to Chart 4, interpreting the median, it can be said that 50% of people in group 3 take 74 seconds or more to perform the HH. In the interpretation of the Fashion, it was found that the most frequent time of HH in group 3 is 74, 81 and 83 seconds (having 3 modes with two people repeating each). Finally, in the interpretation of the Standard Deviation, which was 24 seconds, this number indicates that the results varied less around the mean than in the other groups. This means that, in general, a good part of the sample HH with a speed between 52 seconds and 100 seconds.

As group 3 is composed of companions of hospitalized patients, therefore lay people, this index can be easily justified, since when compared to the other groups, it was the one that performed the HH more quickly, which shows that it did not go away. used the complete technique correctly.

To reduce differences in the way they are understood and applied by health professionals, it is important that HH indications are universally understood, and that the estimated time to perform the HH procedure is 40 to 60 seconds[18].

Thus, it is understood that when the procedure is performed in a shorter time than recommended, the procedure is insufficient.

When analyzed together, that is, the three participating groups in terms of HH time, the median is interpreted as follows: 50% of sample participants take 95 seconds or more to perform the HH. And 50% of sample participants take 95 seconds or less to perform HH. In the interpretation of Fashion, it is verified that the most frequent time of HH in the three groups is 75 seconds (it has four people repeating the time).

As for the standard deviation of the HH time identified as 50 seconds, it can be said that the results varied a lot around the mean of all groups. This means that, in general, a large part of the sample cleans their hands with a speed between 54 seconds and 154 seconds and the interpretation of the coefficient of variation allows us to say that it is possible to see that the coefficient of variation of group 2 is the largest of the groups and the most similar to the coefficient of variation of all groups, thus detaching that the research has a high coefficient of variation and the only group with a low coefficient of variation is group 3, because the lower the value, the more homogeneous they are the data. This information reaffirms the fact that the group of lay participants performs the cleaning empirically, dedicated to observation, representing common sense.

In HH, not only adherence is important, but also its correct execution, considering all the steps established for the successful removal of microorganisms, which can contribute to reducing the incidence of HI. The time is longer than recommended, but the quality of execution of actions is questionable. This could be related to knowing they were being observed/evaluated. But time alone does not reflect the effectiveness of HH[19].

Of course, it could be seen, as shown in Table 2, that in relation to the variable removal of adornments for HH, group 3 is the one with the most non-conformities with 8 (26.6%) of the participants not removing adornments for HH, followed 1 (3.5%) participant in group 1, which is composed of residents. The group of academics showed non-compliance with the variable under discussion.

A study carried out in Recife/PE on the knowledge, attitude, and practice of hand hygiene by nursing professionals shows that most of the interviewees used adornments and, among them, what stood out were the commitment alliances. This observation is equivalent to this study, since such adornment was represented in the 8 participants in group 3 and in the participant in group 1[19].

To sanitize the hands, according to ANVISA's recommendation, the first step of the seven steps to be followed is the removal of hand and forearm adornments. This procedure interferes with the quality of the HH technique[18-20].

Regarding the use of soap and water, as shown in Table 3, 4 (13.4%) of the participants in group 3 and 1 (3.5%) in group 1 did not use these materials. participants in group 2 used such materials.

Knowing the importance of hands in patient contact, the use of soap and water is essential in HH, as cleaning is the basis of any antisepsis process. Considering that this practice must be used routinely, and that this procedure must be performed correctly. For the transmission chain to be broken, it is necessary to adopt basic hygiene standards in the hospital environment[17].

When professionals were asked about the use of products for HH, it was mentioned that rubbing with 70% alcohol gel has greater adherence when compared to the use of common soaps or antiseptic soaps, considering the short time for cleaning and input availability at the time of assistance[20-23].

There was, however, a proximity between the groups when discussing the results of the three groups regarding the variable interlacing the fingers, and 7 (23.4%)

of group 1, 5 (16.7%) of group 2 did not. and 9 (30%) from group 3.

It is noted that, even though it is a simple procedure, the total adherence of the HH steps is still a challenge since relevant data were obtained in relation to the non-performance of step 04 of the Anvisa HH manual.

Some studies discuss this fact in their research where they report that the rate of adherence to correct hand hygiene technique by health professionals is outside the recommendations recommended by the WHO and classified as undesirable or poor[20].

There was also similarity between groups 2 and 3 when discussing the variable rubbing the back of the hands, since only 5 people (16.7%) from groups 2 and 9 (30%) did not show compliance with the correct technique) from group 3, all participants from group 1 performed this step correctly.

The areas that students least sanitized through hand hygiene were the dorsal regions of the thumb and first metacarpal, in addition to the palmar region between the second and fifth metacarpals, which converges with the data obtained, this fact may be related to difficulty understanding all the steps[17].

The variable rubbing the wrists, as recommended by the HH technique allowed us to verify that 4 (13.3%) of the residents do not do it, followed by 6 (20%) of the students and 14 (46.6%) of the companions, generating implications for patient safety due to the significant percentage of non-compliances of the three groups for a technique considered simple. High rates were also verified regarding the act of not rubbing the nails, with non-conformities being distributed as follows: 6 (20%) for group 1, 8 (26.7%) for group 2 and 26 (86.7 %) for group 3, as shown in Table 5.

Only 35.7% of nursing students followed the seven steps recommended by the World Health Organization for the hand hygiene technique. This confirms that when each step is evaluated separately, the rate of complete adherence to the procedure is still insufficient[17,24].

Regarding the use of paper towels, following the correct technique for drying hands (hand-wrist sense), the highest rates of non-compliance were found with the following distribution: 14 (20%) in group 1, 19 (63.3 %%) for group 2 and 24 (86.7%) for group 3, demonstrating that at the end of the HH procedure, the percentages of non-compliance between the three groups are high.

Literature shows that when HH is finished, the correct drying direction is hand-wrist, as it is understood that the wrist can be more contaminated than the hands. The paper towel used for drying hands must be smooth, composed of 100% cellulosic fibers, without fragrance, impurity, or holes, not releasing particles and having good drying properties. It is preferable to use block and roll papers, which allow individual use, sheet by sheet[19,25].

The last variable under discussion was the presence of ink traces (contamination) on the participants' hands after HH. It was found that 19 (63.3%) of group 1 had traces of contamination on their hands after cleaning, 27 (90%) of the participants in group 2 also had traces of contamination, and 25 (83.3%) of the participants in the group 3 showed traces of contamination.

Although group 1 and group 2 have knowledge about the HH technique, it can be said that they are like the sample of group 3, high rates found reveal that there are significant flaws in the procedure.

In the observation of the areas of the hands that are most affected, no academic was able, with the HH, to reach all areas properly, presenting, in the end, the content deposited in the hands since the beginning of the procedure. Thus, according to the findings of this study, the lack of friction in the HH steps may have interfered with the quality of the technique. Therefore, the step-by-step HH technique should be reviewed and oriented between the 3 groups. The areas that had a percentage of error greater than 50.0% were: back of the hand; interdigital spaces; thumb; fingertips and periungual region[17,26].

Conclusion

The study allowed for the identification of deficiencies in the performance of the technique and in adherence to HH, there were variations between the categories studied, and it can be said that assistance/care, from the perspective of low adherence to HH, implies a risk to the safety of patients.

The knowledge of HH as a measure to prevent HAI is millenary, however, for many reasons, it is neglected by many health professionals and the challenge becomes even greater when the caregivers are considered, who, in turn, they can assume the role of spreaders of infections outside the hospital unit, known as community infections. Because, when they meet hospitalized patients and return to their homes, without properly sanitizing their hands, they become vehicles for pathogens.

In this context, the need to develop in-service education strategies that guarantee safe and quality care is emphasized. Namely, that the advantages of this practice are unquestionable, from the reduction of morbidity and mortality of patients to the reduction of costs associated with the treatment of infectious conditions.

When the results were presented, it was evident that there was non-compliance by the 3 groups of participants on the correct way to perform the HH procedure.

Despite the technical superiority of groups 1 and 2 in relation to group 3, the result showed that none of the groups demonstrated knowledge and adherence to the HH technique, noting the evident presence of traces of contamination on their hands, bringing the technical knowledge of undergraduate students closer and nursing professionals with common sense, as less expressive results were expected regarding non-compliance in HH for the groups of academics 27 (90%) and resident nurses 19 (63.3%) when comparing them with the group of companions 25 (83.3%), who after the end of the procedure presented part of the content deposited at the beginning.

The study allowed us to conclude that the practice of HH in the hospital unit where the study was developed deserves special attention, requiring training, generation of

quality indicators and also the dissemination of information to the caregivers of patients regarding the need for adequate hygiene through the production of booklets, simple guidance manuals and lectures aimed at this population, since the impact of non-conformities in the HH of the participating groups can represent a high risk for the safety of hospitalized patients.

Daily health care allows nurses to implement measures that contribute to the simplification of processes to streamline the work and promote the routinization of simple measures, which can contribute to HH, a practice often neglected in the priority of care activities. Different strategies can be used in health units with a view to promote adherence to HH, such as feedback to professionals, encouraging the use of other devices for HH (gel alcohol) and the establishment of a goal plan, with involvement of leaders and staff.

Study limitations were the lack of adequate infrastructure to carry out the data collection stage, considering that the researchers depended on a single room within the university hospital, due to the automatic sink, which was important for the study to be carried out.

References

1. Mistério da Saúde (BR). Segurança do Paciente em Serviços de Saúde: Higienização das Mãos. [Internet]. Brasília (DF): MS; 2009 [acesso em 20 jan 2021]. Disponível em: http://bvsms.saude.gov.br/bvs/publicacoes/seguranca_paciente_servicos_saude_higienizacao_maos.pdf
2. Wright J, Dugdale B, Hammond I, Jarman B, Neary M, Newton D, et al. Learning from death: a hospital mortality reduction programme. Journal of The Royal Society of Medicine. 2006;99(6). DOI: 10.1258/jrsm.99.6.303
3. 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/S1983-14472013000200010
4. Campos DB, Gomes ILV, Alves AR, Moreira TMM, Figueiredo SV. Reflexões sobre a pandemia COVID-19 e ações de educação permanente em enfermagem num hospital. Glob Acad Nurs. 2020;1(3):e50. DOI: 10.5935/2675-5602.20200050
5. SANTOS TCR, Roseira CE, Piai-Morais TH, Figueiredo RM. Higienização das mãos em ambiente hospitalar: uso de indicadores de conformidade. Rev. Gaúcha Enferm. 2014;35(1):70-77. DOI: 10.1590/1983-1447.2014.01.4093
6. Silva ACA, Silva JF, Santos LRO, Avelino FVSD, Santos AMR, Pereira AFM. A segurança do paciente em âmbito hospitalar: revisão integrativa da literatura. Cogitare Enfermagem. 2016;21(5). DOI: 10.5380/ce.v21i5.37763
7. Organização Mundial de Saúde (OMS). Manual de referência técnica para a higiene das mãos. [Internet]. Rio de Janeiro (RJ): OMS: 2009 [acesso em 22 jan 2021] Disponível em: https://www.saude.rj.gov.br/comum/code/MostrarArquivo.php?C=ODk1OA%2C%2C
8. Ministério da Saúde (BR) Documento de referência para o Programa Nacional de Segurança do Paciente para o Ministério da Saúde [Internet]. Brasília (DF): MS:2014 [acesso em 22 jan 2021]. Disponível em: https://bvsms.saude.gov.br/bvs/publicacoes/documento_referencia_programa_nacional_seguranca.pdf
9. Feldhaus C. Loro MM, Rutke TCB, Matter PS, Kolankiewicz ACB, Stumm EMF. Conhecimento de acadêmicos de enfermagem e fisioterapia sobre higiene das mãos. Rev Min Enferm. 2018;1(1). DOI: DOI: 10.5935/1415-2762.20180026
10. Ribeiro AEO, Lima MS, Castro RA, Ribeiro RLS, Santos CRB. Infecções hospitalares: aspectos relevantes e a atuação dos profissionais de enfermagem no controle de infecções. Mostra Interdisciplinar do Curso de Enfermagem [Internet]. 2016 [acesso em 22 jan 2021];2(1). Disponível em: https://publicacoesacademicas.unicatolicaquixada.edu.br/index.php/mice/article/view/1116
11. Fontelles MJ, Simões MG, Farias SH, Fontelles RGS. Metodologia da pesquisa científica: diretrizes para a elaboração de um protocolo de pesquisa. Revista Paraense de Medicina [Internet]. 2009 [acesso em 23 jan 2021];23(3). Disponível em: https://pesquisa.bvsalud.org/portal/resource/pt/lil-588477
12. Marconi MA, Lakatos EM. Fundamentos de metodologia científica. 6ª Edição. São Paulo: Atlas, 2005
13. Nascimento DO, Santos LA. Infecção relacionada à saúde: Percepção dos profissionais de saúde sobre seu controle. Revista Interdisciplinar [Internet]. 2016 [acesso em 23 jan 2021];9(2). Disponível em: https://dialnet.unirioja.es/descarga/articulo/6771903.pdf
14. Polit DF, Beck CT, Hungler BP. Fundamentos de pesquisa em enfermagem: métodos, avaliação e utilização. 5ª Edição. Porto Alegre: Artmed; 2004
15. Araújo TAM, Vasconcelos ACCP, Pessoa Talitha RRF, Forte FDS. Multiprofissionalidade e interprofissionalidade em uma residência hospitalar: o olhar de residentes e preceptores. Interface. 2017;21(62). DOI: 10.1590/1807-57622016.0295
16. Santos RA, Lope VC, Camilo SO, Majorino FT. Percepções do graduando de enfermagem sobre a importância do acompanhante do paciente internado. Revista de Enfermagem do Centro Oeste. Mineiro. 2015;5(1). DOI: 10.19175/recom.v0i0.690
17. Silva VD, Caetano JA, Silva LA, Freitas MMC, Almeida PC, Rodrigues JLN. Avaliação da higiene das mãos dos acadêmicos de enfermagem e medicina. Revista da Rede de Enfermagem do Nordeste. 2017;18(2). DOI: 10.15253/2175-6783.2017000200016
18. Dourado CARO, Barros DCC, Vasconcelos RVD, Santos AHS. Inquérito sobre conhecimento, atitude e prática de higiene das mãos pelos profissionais da enfermagem. Rev. enferm. UFPE On Line. 2017;11(3). DOI: 10.5205/reuol.10544-93905-1-RV.1103201703
19. Rodríguez EOL, Oliveira JKA, Menezes MO, Silva LSL, Almeida DM, Neto DL. Aderência de profissionais de saúde à higienização das mãos. Rev Enferm UFPE On Line. 2018;6(12). DOI: 10.5205/1981-8963-v12i6a230841p1578-1585-2018
20. Cunha EB, Cohen JVFB. Aspectos relevantes da prevenção e controle de infecções hospitalares. Revista Saber Cientifico. 2016;1(1). DOI: 10.22614/resc-v6-n2-666
21. Giarola LB, Baratieri T, Costa AM, Bedendo J, Marcon SS, Waidman MAP. Infecção hospitalar na perspectiva dos profissionais de enfermagem: um estudo bibliográfico. Cogitare Enfermagem. 2012;17(1). DOI: 10.5380/ce.v17i1.26390
22. Juskevicius LF, Padoveze MC. Precauções específicas para evitar a transmissão de microrganismos: desenvolvimento e validação de roteiro educacional. Cogitare Enfermagem. 2016;21(4). DOI: 10.5380/ce.v21i4.47060

23. Negromote GRP, Nascimento JS, Brígido JVC, Carvalho AMC, Farias RLGP. Estudo de variáveis envolvidas em infecção do trato urinário nosocomiais em um hospital universitário. Rev. Soc. Bras. Clin. Med [Internet]. 2015 [acesso em 23 jan 2021];13(2). Disponível em: http://files.bvs.br/upload/S/1679-1010/2015/v13n2/a4735.pdf
24. Prado MF, Hartmann TPS, Filho LAT. Acessibilidade da estrutura física hospitalar para a prática da higienização das mãos. Esc. Anna Nery. 2013;17(2). DOI: 10.1590/S1414-81452013000200003
25. Sousa AFL, Oliveira LB, Moura MEB. Perfil epidemiológico das infecções hospitalares causadas por procedimentos invasivos em unidade de terapia intensiva. Revista Prevenção de Infecção e Saúde [Internet]. 2016 [acesso em 24 jan 2021];2(1-2). Disponível em: https://revistas.ufpi.br/index.php/nupcis/article/view/6048
26. 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). DOI: 10.1590/1983-1447.2015.04.49090