

Healthcare professionals' hand hygiene: perspectives of nursing student's in patients/relatives role

Higiene das mãos dos profissionais de saúde: perspectivas do estudante de enfermagem no papel de paciente/familiar

Higiene de manos de los profesionales de la salud: perspectiva de estudiantes de enfermería en el papel de paciente/familiar

Gül Bülbül Maraş¹  <https://orcid.org/0000-0001-6357-4085>

Elem Kocaçal²  <https://orcid.org/0000-0002-0567-574X>

Arzu Bahar³  <https://orcid.org/0000-0002-2132-1968>

How to cite:

Maraş GB, Kocaçal E, Bahar A. Healthcare professionals' hand hygiene: perspectives of nursing student's in patients/relatives role. Acta Paul Enferm. 2024;37:eAPE003511.

DOI

<http://dx.doi.org/10.37689/acta-ape/2024A0000003511>



Keywords

Hand hygiene; Cross infections; Students, nursing; Inpatients; Attitude; Health knowledge, attitudes, practice; Hospitalization

Descritores

Higiene das mãos; Infecção hospitalar; Estudantes de enfermagem; Pacientes internados; Atitude; Conhecimentos, atitudes e prática em saúde; Hospitalização

Descriptores

Higiene de las manos; Infección hospitalaria; Estudiantes de enfermería; Pacientes internos; Actitud; Conocimientos, actitudes y práctica en salud; Hospitalización

Submitted

February 17, 2023

Accepted

August 30, 2023

Corresponding author

Elem Kocaçal
E-mail: elem.kocacal@hotmail.com

Associate Editor (Peer review process):

Márcia Barbieri
(<https://orcid.org/0000-0002-4662-1983>)
Escola Paulista de Enfermagem, Universidade Federal de São Paulo, São Paulo, SP, Brasil

Abstract

Objective: To investigate the views and attitudes of nursing students, as patients or relatives, on healthcare professionals' hand hygiene behavior and patient participation hand hygiene campaign.

Methods: This prospective cross-sectional study was conducted in the nursing departments of the health and science faculties at two Turkish universities between 2021-2022. The study sample comprised 330 students. Data were collected using a self-administered questionnaire. The response rate of the questionnaire was 89.43%. Chi-square test was used in data analysis.

Results: The mean age of students was 19.80±1.30 years, 76.1% were female, 50.9% stated they had received education regarding healthcare-associated infections (HAI). While 30.1% of students reported they performed hand hygiene "9-11 times" in their daily lives, 54.6% reported performing "12-15 times" in the hospital, and 96.4% of students expressed wondering if healthcare professionals performed hand hygiene before offering care during hospitalizations. Among students, 30.5% stated that reminders from patients and their relatives about performing hand hygiene before contact with patients would make them happy. There was a statistically significant difference between students' previous training in HAIs and hand hygiene as an important inpatient care (p<0.05).

Conclusion: Nursing students had sufficient knowledge of hand hygiene and a positive attitude towards hand hygiene behaviors of healthcare professionals. Nursing students, such as patients and their relatives, can be included in hand hygiene campaigns for healthcare professionals, provided that the program steps are well planned.

Resumo

Objetivo: Investigar as opiniões e atitudes dos estudantes de enfermagem no papel de pacientes ou familiares de pacientes, a respeito do comportamento de higiene das mãos dos profissionais de saúde e da participação dos pacientes na campanha de higiene das mãos.

Métodos: Estudo transversal prospectivo realizado entre 2021-2022 no Nursing Department, Faculty of Health Sciences, de duas universidades turcas. A amostra do estudo foi composta por 330 alunos. Os dados foram coletados por meio de questionário autoaplicável. A taxa de resposta do questionário foi de 89,43%. O teste qui-quadrado foi utilizado na análise dos dados.

Resultados: A média de idade dos estudantes foi de 19,80±1,30 anos, 76,1% eram do sexo feminino, 50,9% afirmaram ter recebido instrução sobre Infecções Associadas aos Cuidados de Saúde (IACS). Enquanto 30,1% dos estudantes relataram realizar a higiene das mãos "9 a 11 vezes" em sua vida diária, 54,6% relataram "12 a 15 vezes" no hospital, e 96,4% dos estudantes se perguntaram se os profissionais de saúde realizavam a

¹Izmir Demokrasi University, Vocational School of Health Services, Izmir, Turkey.

²Izmir Demokrasi University, Faculty of Health Sciences, Fundamentals of Nursing, Izmir, Turkey.

³Yuksekk Ihtisas University, Faculty of Health Sciences, Fundamentals of Nursing, Ankara, Turkey.

Conflicts of interest: nothing to declare.

higiene das mãos antes de fornecer cuidados durante as internações. De acordo com 30,5% dos estudantes, lembretes dos pacientes e seus familiares sobre a realização da higiene das mãos antes do contato com os pacientes os deixariam satisfeitos. Houve diferença estatisticamente significativa entre a instrução anterior dos estudantes sobre IACS e a higiene das mãos como cuidado importante a pacientes hospitalizados ($p < 0,05$).

Conclusão: Os estudantes de enfermagem apresentaram conhecimento suficiente sobre a higiene das mãos e uma atitude positiva frente aos comportamentos de higiene das mãos dos profissionais de saúde. Estudantes de enfermagem como pacientes e familiares dos pacientes podem ser incluídos nas campanhas de higiene das mãos dos profissionais de saúde, desde que as etapas do programa sejam bem planejadas.

Resumen

Objetivo: Investigar las opiniones y actitudes de los estudiantes de enfermería en el papel de pacientes o familiares de pacientes respecto al comportamiento de higiene de manos de los profesionales de la salud y de la participación de los pacientes en la campaña de higiene de manos.

Métodos: Estudio transversal prospectivo realizado entre 2021 y 2022 en el Nursing Department, Faculty of Health Sciences, de dos universidades turcas. La muestra del estudio estuvo compuesta por 330 alumnos. Los datos se recopilieron mediante cuestionario autoaplicado. El índice de respuesta del cuestionario fue de 89,43 %. Se utilizó la prueba ji cuadrado en el análisis de los datos.

Resultados: El promedio de edad de los estudiantes fue de $19,80 \pm 1,30$ años, el 76,1 % era de sexo femenino, el 50,9 % afirmó haber recibido instrucción sobre infecciones asociadas a los cuidados de la salud (IACS). Mientras el 30,1 % de los estudiantes relató realizar la higiene de manos "9 a 11 veces" en su vida diaria, el 54,6 % relató "12 a 15 veces" en el hospital, el 96,4 % de los estudiantes se preguntó si los profesionales de la salud realizaban la higiene de manos antes de brindar cuidados durante las internaciones. El 30,5 % de los estudiantes estuvo satisfecho con los recordatorios de los pacientes y sus familiares sobre la realización de la higiene de manos antes del contacto con los pacientes. Hubo diferencia estadísticamente significativa entre la instrucción anterior de los estudiantes sobre IACS y la higiene de manos como cuidado importante en pacientes hospitalizados ($p < 0,05$).

Conclusión: Los estudiantes de enfermería presentaron conocimientos suficientes sobre la higiene de manos y una actitud positiva frente a los comportamientos de higiene de manos de los profesionales de la salud. Puede incluirse a los estudiantes de enfermería como pacientes y familiares de los pacientes en las campañas de higiene de manos de los profesionales de la salud, siempre que las etapas del programa estén bien planificadas.

Introduction

Healthcare-associated infections (HAIs) are a significant source of healthcare costs and patient morbidity and mortality, and affect millions of hospitalized patients globally each year (World Health Organization [WHO]).⁽¹⁾ According to the WHO, out of every 100 hospitalized patients at any time, seven in developed countries and ten in developing countries acquire at least one HAI.⁽¹⁾ Infection prevention and control measures should be implemented properly to prevent HAIs.^(2,3)

Hand hygiene alone is the simplest and most effective measure to reduce and prevent HAI rates.^(1,2,4) Despite the fact that hands are known to be the most common source of pathogen transmission, low compliance with hand hygiene among healthcare professionals (HCPs) is the leading factor in the spread of HAIs.^(5,6-8)

Healthcare professionals are assumed to be a potential group for the transmission of HAIs. Nursing students, like nurses, are in close contact with patients and spend the most time with patients during clinical practice in health institutions.⁽⁹⁾ Clinical practice is widely recognized as an essential component of nursing student education. It enables the integration of theoretical knowledge and practice,

and nursing students learn by doing in a real environment and by observing HCPs. Therefore, they are expected to possess a heightened awareness in observing and questioning the hand hygiene practices of HCPs. In spite of this, nursing students in the role of patient and patient's relative at the hospital may exhibit a different manner about the hand hygiene behaviors of HCPs. While some nursing students care about the hand hygiene behaviors of HCPs with an overly conscious attitude, on the contrary, others may pretend to be members of the general population. We thought this may arise from the severity of the disease, major personality traits, personal preferences, hospital environment, knowledge level of hand hygiene.^(9,10)

Students' awareness of hand hygiene is critical not only to prevent HAIs, but also for patient safety and well-being.⁽¹¹⁾ Previous studies on nursing students' hand hygiene compliance looked at individual factors such as knowledge level, attitude,^(8,12,13) belief about hand hygiene^(5,9,14) and the effect of HCPs' hand hygiene behaviors in practice.⁽¹⁵⁾ Furthermore, there is also few observational research on students' hand hygiene compliance in the literature.^(6,13,16)

Hand hygiene is a self-responsible behavior of HCPs.^(3,17) It is believed that individuals other than HCPs who question the state of these profession-

als' hand hygiene will trigger hand hygiene behavior and increase hand hygiene rates. To that end, the WHO and the Centers for Disease Control and Prevention (CDC) recommend a combination of multiple strategies to promote hand hygiene compliance worldwide.⁽³⁾ Patient participation in hand hygiene campaigns or patient empowerment are some of the recommended and effective multimodal strategies. In such strategy, patients/patients' relatives are encouraged to remind HCPs to perform hand hygiene before providing care. However, little is known about HCPs' views of hand hygiene-related patient empowerment.^(17,18)

As individuals working with HCPs in clinics, nursing students who perform clinical practice are among the most reliable sources for observing hand hygiene behavior. They may play a triggering role in initiating the hand hygiene behavior of HCPs. As far as we know, no other study has been found in the literature in which nursing students in the role of the patient evaluated HCPs' hand hygiene behaviors. The main objective of this study was to investigate nursing students' perspectives and attitudes toward HCPs' hand hygiene behaviors when hospitalized as patients or as patients' relatives. In addition to nursing students' knowledge of hand hygiene indications, their attitudes as patients participating in the hand hygiene campaign were evaluated.

Methods

This descriptive cross-sectional study was conducted in the nursing departments of health and science faculties at a state university in İzmir and a foundation university in Ankara, Turkey, between 2021-2022. The study population consisted of 369 students who had received education in the nursing departments of both universities. There was no sample selection process because the entire universe was intended to be served as the study sample. Volunteer students without communication problems were included in the study sample and students who refused to participate in the study were excluded. The study sample comprised 330 students. The rate of participation in the study was 89.43%.

Research data were gathered using a self-administered questionnaire created by the researchers in accordance with comprehensive literature.^(3,7,13,17,18) The questionnaire was processed via Google Forms. It consisted of five questions regarding nursing students' socio-demographics, opinions and knowledge status (five questions) regarding WHO's five hand hygiene indications. The 'Clean Care is Safe Care' campaign of the WHO covers these indications. The '5 Indications Rules for Hand Hygiene' for HCPs, also published in the Hospital Service Quality Standards of the Ministry of Health of Turkey in 2009 and 2011, was the basis for these questions.⁽¹⁹⁾ The questionnaire also asked nursing students about their opinions and attitudes regarding the hand hygiene behaviors of HCPs. The questionnaire form included close-ended questions. The answers to questions evaluating the attitudes of participants were given in a 5-point Likert-type with the following categories: 1=Strongly agree; 2=Agree; 3=I'm undecided; 4=Disagree; 5=Strongly disagree. The expert opinions of six academics and four clinicians were considered for content validity, and the questionnaire was finalized after minor modifications. In terms of reliability of the questionnaire, a pilot study was undertaken at a single site (a classroom) with ten nursing students attending different years of the course who were not included in the main study. The students completed the questionnaire once, and then a second time 14 days later. Intra-class correlation coefficients for both sets of results had a test-retest reliability coefficient of 0.91 ($p = 0.038$).

First, the questionnaire form was shared through official student WhatsApp communication groups provided by their universities, and students were asked to complete the questionnaire online. An average of eight minutes was required to complete the questionnaire.

Data obtained from the study were analyzed electronically using the Statistical Package for the Social Sciences (SPSS) 20.0. The number, percentage, mean, chi-square test, and standard deviation of data were calculated and are presented using integrated charts.

After obtaining approval from the Research Ethics Committee (Ethics Committee Decision

No:2020/20-6) of the Ethics Committee of Izmir Democracy University, permission was obtained from the relevant universities. In the first part of the online data collection forms, students were explained about the purposes and methods of the study. Informed consent was obtained online from the students. This study was conducted in accordance with principles of the Declaration of Helsinki.

Results

All students in the universe (n=369) were potentially eligible, and after examining eligibility, 330 students were included in the study and it was completed with 89.43% of participation. Students' mean age was 19.80±1.30 years, 76.1% were female, 69.7% of students had graduated from general high school and 8.5% had graduated from medical vocational high school. Additionally, 41.5% of participants were first-year students at these universities, 64.8% of participants stated that they or their relatives had a previous hospital stay experience and 11.5% reported having HAIs during hospitalization (Table 1).

Table 1. Demographic characteristics of nursing students

Variables	n(%)
Age	
Mean + SD (min-max)	19.8 + 1.30 (17-24)
Sex	
Female	251(76.1)
Male	79(23.9)
Type of high school	
Health vocational high school	28(8.5)
Regular high school	230(69.7)
Anatolian/Science high school	31(9.4)
Others	41(12.4)
Course year	
Freshman	137(41.5)
Sophomore	91(27.6)
Junior	88(26.7)
Senior	14(4.2)
Experience of previous hospitalization	
Yes	214(64.8)
No	116(35.2)
Previous HAI experience during hospitalization	
Yes	38(11.5)
No	292(88.5)
Total	330(100)

Of the students, 50.9% stated having received education on HAIs and 53.9% of those who re-

ceived education expressed having been informed by HCPs in the courses at school. Among participants, 30.1% said they performed hand hygiene 9-11 times, and 29.4% stated they performed hand hygiene 1-4 times in their daily lives. On the other hand, 54.6% of students indicated they performed hand hygiene 12-15 times in a hospital environment. As for the perceived obstacles to hand hygiene, the dirtiness of wash basins accounted for 47%, and the lack of time given the excessive frequency of interventions represented 20% when they were in the hospital (Table 2).

Of the students, 92.1% stated that the involvement of individuals other than HCPs in activities, such as patients, patients' relatives and interns, with the aim to increase hand hygiene rates might be effective to increase compliance. According to 67% of participants, health professionals partially adapted to situations in which hand hygiene should be followed in hospital practice (Table 3). Nursing students that wondered if HCPs had performed hand hygiene or not before giving care during hospitalization accounted for 96.4%. When admitted to hospital, 74.5% of participants said they did not ask HCPs if they had performed hand hygiene before providing medical care and 42.1% thought it was disrespectful to question their hand hygiene behavior (Table 3).

Of the nursing students, 89.6% answered 'strongly agree' to the statement, 'I think hand hygiene is important for patient care'. In relation to the statement 'I observe if healthcare professionals perform hand hygiene or not in the hospital', 45.2% of students answered 'I agree' and 18.8% remained undecided. To the statement 'I think the hand hygiene rates of healthcare professionals will affect my choice of hospital', 40.3% of the students responded 'strongly agree' and 6.1% 'I disagree'. Among nursing students, 73.6% strongly agree that it was more comfortable to know that HCPs performed hand hygiene before touching them. A total of 43.9% of students agree that the frequent hand hygiene of the nurse would affect their choice of nurse. (Table 3). Reminders from patients and their relatives to perform hand hygiene before contact

Table 2. Some of the characteristics, habits and views of hand hygiene among nursing students

Variables	n(%)
Status of receiving education on HAIs	
Yes	168(50.9)
Sources of information about HAIs	
No information on HAIs	81(24.5)
Courses	178(53.9)
Audiovisual and social media organs (TV, newspaper, journals, internet etc.)	12(3.6)
Other health care professionals	27(8.2)
Frequency of daily hand hygiene	
1-4 times	97(29.4)
5-8 times	91(27.8)
9-11 times	99(30.1)
12-15 times	0(0)
> 16 times	43(13.1)
Frequency of daily hand hygiene in the hospital	
1-4 times	34(10.3)
5-8 times	38(11.5)
9-11 times	78(23.6)
12-15 times	180(54.6)
Hand hygiene barriers when in hospital as a patient or intern	
Absence of wash basin in patient rooms	23(7)
Lack of time due to frequent applications	66(20)
Dirty wash basins	155(47)
Lack of equipment	57(17.2)
Thinks that non-health professionals reminding healthcare professionals to perform hand hygiene is effective for the increase in healthcare professionals' compliance to hand hygiene	
Yes	304(92.1)
Considers that healthcare professionals comply with all indications that hand hygiene should be applied in the hospital	
Sufficient	56(17.0)
Partially sufficient	221(67.0)
Insufficient	53(16)
Wonders if healthcare professionals have performed hand hygiene before giving care during hospitalization	
Yes	318(96.4)
Asks healthcare professionals if they have performed hand hygiene before giving care during hospitalization	
Yes	84(25.5)
How does it feel to remind healthcare professionals to perform hand hygiene before care during hospitalization	
Embarrassing	95(28.8)
Disrespectful	139(42.1)
Like upsetting the physician/nurse	35(10.6)
Thinks it will not work	5(10.6)
Thinks this will negatively affect the care they will provide	12(3.6)
Uncomfortable	44(13.3)

with patients made 30.5% of students happy. Furthermore, 20% believed it is the patient's right to know if HCPs performed hand hygiene, and 15% believed they would feel embarrassed if they had not performed hand hygiene. On the other hand, 4.6% of participants stated they would be proud to say that they performed hand hygiene, whereas 1.8% said it would be fine if they were

Table 3. Attitudes and perceptions of nursing students as patients/patients' relatives towards hand hygiene of healthcare workers

Questions	I strongly disagree n(%)	I disagree n(%)	I'm undecided n(%)	I agree n(%)	I strongly agree n(%)
I think hand hygiene is important for patient care.	28(8.5)	4(1.2)	0(0)	2(0.6)	296(89.6)
I observe if healthcare professionals perform hand hygiene or not in the hospital.	12(3.6)	19(5.8)	62(18.8)	149(45.2)	88(26.7)
I wish that healthcare professionals perform hand hygiene within my field of vision.	11(3.3)	32(9.7)	67(20.3)	129(39.1)	91(27.6)
If I know that healthcare professionals perform hand hygiene before touching me, this will make me more comfortable.	12(3.6)	5(1.5)	2(0.6)	68(20.6)	243(73.6)
Before touching me, I would like healthcare professionals to tell me if they performed hand hygiene.	6(1.8)	35(10.6)	65(19.7)	119(36.1)	105(31.8)
I would like to remind healthcare professionals who do not perform hand hygiene, if they need to be reminded by someone.	8(2.4)	14(4.2)	64(19.4)	124(37.6)	120(36.4)
I think that the frequent hand hygiene of the physician will affect my choice of physician.	9(2.7)	28(8.5)	55(16.7)	136(41.2)	102(30.9)
I think that the frequent hand hygiene of the nurse will affect my choice of nurse.	8(2.4)	28(8.5)	42(12.7)	145(43.9)	107(32.4)
I think the hand hygiene rates of healthcare professionals will affect my choice of hospital.	8(2.4)	20(6.1)	42(12.7)	127(38.5)	133(40.3)

asked to perform hand hygiene properly. In relation to the question 'Is it necessary that HCPs perform hand hygiene before contact with the patient?', 97.6% of students responded correctly by answering 'Yes'. In a similar way, 97.6% of participants responded correctly by answering 'Yes' to the question 'Is it necessary that HCPs perform hand hygiene after their hands/gloves are contaminated with blood and body fluids?'. There were no statistically significant differences between participants' sex, course year, previous HAI status, or attitude towards hand hygiene ($p>0.05$). There was a statistically significant difference between students' previous training in HAI and finding hand hygiene important for inpatient care ($p<0.05$).

Discussion

Hand hygiene is critical to reduce the incidence of HAIs in all healthcare settings. Promoting HCPs compliance with hand hygiene remains a complex issue, because of the many factors influencing it. This study examined nursing students' perceptions and attitudes towards hand hygiene behaviors when admitted to hospitals as patients or patients' relatives. Our study is a pioneering one, in which patient participation in hand hygiene campaigns was evaluated from the perspective of nursing students, in addition to nursing students' knowledge of hand hygiene indications.

Those with a history of HAIs may be more aware of the importance of infection prevention. Experience with HAI during previous hospitalizations has been studied mostly in patients and special groups, with only a few studies on students. Recent studies have shown that the incidence of HAIs is between 7-10% in developed and developing countries.^(20,21) Consistently, we found that 11% of students or their family members had previously experienced HAI. On the other hand, Kingston et al. (2017) reported that 62% of students had previously developed a HAI, either themselves or in their family members.⁽⁸⁾ This variation in study findings might be due to the differences in the characteristics of sample groups and in the care policies where the studies were conducted.

In addition to theoretical and practical education, student participation in incentive activities to improve HCPs' hand hygiene in clinics may raise awareness of the importance of hand hygiene compliance in their professional lives. In our study, half of students had received hand hygiene training. Besides, Jeong and Kim (2016) revealed that 89.4% of students in their study had received prior education.⁽⁹⁾ Similarly, the reported percentages in Kingston et al. (2017), Foote and El Masri (2016), and Tem et al. (2019) studies are 99%, 98%, and 98.3%, respectively.^(4,22,23) This diversity in education rates may be due to differences in institution policies, course curriculums, and sample size.

In our study, we found that most students performed hand hygiene more frequently in the hos-

pital environment (12-15 times) than at home (9-11 times). According to Sultana et al. (2016), students performed hand hygiene 3-5 times per day,⁽²⁴⁾ while Ryu and Lim (2013) reported 7.2 times on average.⁽²⁵⁾ Another study in Turkey by Öncü et al. (2018) reported that students performed hand hygiene 6-10 times in the hospital.⁽¹⁶⁾ According to Ceylan et al. (2020), female students performed hand hygiene more frequently than male students (13.53 times).⁽⁵⁾ Since there are more female students than male students in our study, the frequency of hand hygiene is consistent with the findings of Ceylan et al.⁽⁵⁾ This means that the findings of our study are in line with those of Ceylan et al. (2020) and Öncü et al. (2018).^(5,16) The frequency of hand hygiene in our study was higher than that in other studies, which is remarkable because the number of students who received training in HAIs was lower than that in other studies. This may be because their awareness of the value of hand hygiene has increased during the COVID-19 pandemic. Strong instincts for self-protection and increased public service ads may also contribute to the increase in hand hygiene frequency.

While approximately 70% of students stated there were no obstacles to hand hygiene in a hospital setting, approximately half perceived dirty wash basins as obstacles. Workload and lack of materials were identified as additional barriers to hand hygiene. According to Zimmerman et al. (2020), Foote and El Masri (2016), and McLaws et al. (2015), the workload, unsuitable conditions, lack of time, inadequate wash basins and materials used to provide hand hygiene negatively affect the compliance of HCPs.^(12,22,26,27)

Unfortunately, in healthcare settings, the hand hygiene compliance rate of HCPs is often not at a desirable level,⁽²⁷⁾ and poor practices can be observed and imitated by nursing students during clinical education.⁽²⁸⁾ Approximately 70% of students reported that HCPs' compliance with hand hygiene during clinical practice was only partially sufficient. Furthermore, almost all students were curious if HCPs performed hand hygiene or not before giving care during hospitalization. In our study, it was important to observe and question if

HCPs performed hand hygiene before and after patient contact during hospitalization. In a study by Kim et al. (2015) conducted with patients and their relatives, approximately 60% of participants stated they generally observed if HCPs performed hand hygiene before and after contact with patients.⁽²⁹⁾ These results are consistent with ours.

In our study, most students indicated that hand hygiene campaigns with patient participation increased the hand hygiene compliance of HCPs. Longtin et al. (2012) reported that 74% of HCPs supported hand hygiene campaigns with patient participation.⁽³⁰⁾ However, in the same study, HCPs reported only a 3% rate of reminders by patients/relatives about pre-care hand hygiene. Similarly, Sande-Meijide et al. (2019) found that 96% of nurses supported patient participation in hand hygiene campaigns.⁽³¹⁾ In contrast, only 25% of nurses in their study agreed with the patient reminding them to perform hand hygiene before receiving care.

Previous studies found that HCPs had a less positive attitude toward and intention to participate in patient empowerment than patients/families.^(26,32,33) These findings show that while HCPs appear to support patient participation in hand hygiene programs in general, they dislike being reminded of hand hygiene or having their hand hygiene behavior questioned. A reason for this could be the discomfort caused by the sense of being watched and controlled. Other reasons may include a desire to complete the work as soon as possible owing to time constraints and excessive workload. Healthcare professionals may be concerned that this will lead to communication breakdowns between patients and their families, who experience adjustment issues.

In promoting hand hygiene with patient participation, HCPs' attitudes towards patients and their relatives are key points in patients' attitudes towards participation and the success of the campaign.^(31,33) Most people are less comfortable reminding a colleague/subordinate about hand hygiene due to the practice of upward feedback, when a subordinate provides feedback to their supervisor and is afraid of receiving a negative reaction.⁽³⁴⁾ In this study, nursing students, as a patient or a patient's relative, were unwilling to question HCPs if they performed

hand hygiene before providing care. Fear of disrespect, embarrassment, inconvenience, and/or poor treatment may be reasons for this unwillingness, fear of upsetting HCPs, and jeopardizing their care. Students' concerns as patients or their relatives are similar to those of previous research findings.^(30,31) We believe that this situation is due to an inability to predict HCP reactions or fear of negatively affecting the HCP/patient relationship. Patients' willingness to question their HCPs' state of hand hygiene may have been influenced by various factors including the manner how they question, their physical environment, socio-demographics, and personality traits. According to Seale et al. (2015), patients are hesitant to ask nurses or physicians to perform hand hygiene or to confirm if they are performing hand hygiene.⁽³²⁾

In this study, we discovered that students had positive attitudes towards patients and their relatives, reminding them of their pre-care hand hygiene. Lastinger et al. (2017) and Longtin et al. (2012) have reported that HCPs may feel uncomfortable, regrettable, embarrassed, or insulted when asked or reminded by a patient to perform hand hygiene.^(30,35) According to Kim et al. (2015), HCPs do not want to be judged negatively by patients for their hand hygiene behaviors.⁽²⁹⁾ Eng et al. (2021) reported that patients who reminded HCPs about hand hygiene perceived positive or neutral reactions in 76.8% of the occasions and negative or surprising reactions in 23.2% of the occasions.⁽³⁴⁾

This study has several limitations. First, it was conducted at only two universities, and the results may not represent the knowledge of all nursing students in Turkey. The second limitation was the collection of data via a web-based self-reported questionnaire, instead of face-to-face interviews. The third limitation is the use of a voluntary, simple, random sampling method to facilitate data collection during the COVID-19 pandemic.

Conclusion

Effective patient empowerment is one of the most important hand hygiene promotion strategies in the

guidelines for the prevention of HAIs. In conclusion, the results of this study revealed that nursing students had adequate knowledge of hand hygiene and a positive attitude towards HCPs' hand hygiene behaviors. Although students were aware of the importance of HCPs' hand hygiene behaviors for preventing HAIs, we found that nursing students, such as interns or HCPs, may feel uneasy when their hand hygiene behaviors are questioned. We believe that it would be beneficial to include nursing students, as patients/patient's relatives, in hand hygiene campaigns for HCPs. Nursing students having more awareness than the general public could help to improve the hand hygiene compliance of HCPs. Further studies with larger populations should be performed.

Acknowledgements

To the all-volunteer students in İzmir Demokrasi University, Faculty of Health Sciences, Nursing Department and Yüksek İhtisas University, Faculty of Health Sciences, Nursing Department.

Collaborations

Maraş GB, Kocaçal E and Bahar A declare that they contributed to the study design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and approval of the final version to be published.

References

- World Health Organization (WHO). Healthcare-associated infections. Fact sheet. Geneva: WHO; 2011 [cited 2023 May 3]. Available from: https://www.who.int/gpsc/country_work/gpsc_ccisc_fact_sheet_en
- Haque M, Sartelli M, McKimm J, Abu Bakar M. Health care-associated infections - an overview. *Infect Drug Resist.* 2018;11:2321-33.
- World Health Organization (WHO). A Guide to the Implementation of the WHO Multimodal Hand Hygiene Improvement Strategy (No. WHO/IER/PSP/2009/02). Geneva: WHO; 2009 [cited 2023 May 3]. Available from: <https://apps.who.int/iris/handle/10665/70030>
- Kingston LM, O'Connell NH, Dunne CP. Survey of attitudes and practices of Irish nursing students towards hand hygiene, including handrubbing with alcohol-based hand rub. *Nurse Educ Today.* 2017;52:57-62.
- Ceylan B, Gunes U, Baran L, Ozturk H, Sahbudak G. Examining the hand hygiene beliefs and practices of nursing students and the effectiveness of their handwashing behaviour. *J Clin Nurs.* 2020;29(21-22):4057-65.
- Sadafi M, Bahmanpour K, Nouri B, Valiee S. Effect of multimodal intervention on nursing students' adherence to hand hygiene: an experimental study. *Creat Nurs.* 2021;27(3):209-15.
- Alzyood M, Jackson D, Brooke J, Aveyard H. An integrative review exploring the perceptions of patients and healthcare professionals towards patient involvement in promoting hand hygiene compliance in the hospital setting. *J Clin Nurs.* 2018;27(7-8):1329-45. Review.
- Pittet D, Boyce JM, Allegranzi B. Hand hygiene: a handbook for medical professionals. John Wiley & Sons Ltd; 2017.
- Jeong SY, Kim KM. Influencing factors on hand hygiene behavior of nursing students based on theory of planned behavior: a descriptive survey study. *Nurse Educ Today.* 2016;36:159-64.
- Jamshidi N, Molazem Z, Sharif F, Torabizadeh C, Najafi Kalyani M. The challenges of nursing students in the clinical learning environment: a qualitative study. *ScientificWorldJournal.* 2016;2016:1846178.
- Kısacık ÖG, Çiğerci Y, Güneş Ü. Impact of the fluorescent concretization intervention on effectiveness of hand hygiene in nursing students: a randomized controlled study. *Nurse Educ Today.* 2021;97:104719.
- Zimmerman PP, Sladdin I, Shaban RZ, Gilbert J, Brown L. Factors influencing hand hygiene practice of student nurses: A descriptive, mixed-methods study. *Nurse Educ Pract.* 2020;44:102746.
- Sundal JS, Aune AG, Storvig E, Aasland JK, Fjeldsaeter KL, Torjuul K. The hand hygiene compliance of student nurses during clinical placements. *J Clin Nurs.* 2017;26(23-24):4646-53.
- Ng WK, Shaban RZ, van de Mortel T. Hand hygiene beliefs and behaviours about alcohol-based hand rub use: Questionnaire development, piloting and validation. *Infect Dis Health.* 2020;25(1):43-9.
- Carter EJ, Mancino D, Hessels AJ, Kelly AM, Larson EL. Reported hours of infection education received positively associated with student nurses' ability to comply with infection prevention practices: Results from a nationwide survey. *Nurse Educ Today.* 2017;53:19-25.
- Öncü E, Vayisoğlu SK, Lafcı D, Yıldız E. An evaluation of the effectiveness of nursing students' hand hygiene compliance: A cross-sectional study. *Nurse Educ Today.* 2018;65:218-24.
- Gesser-Edelsburg A, Cohen R, Zemach M, Halavi AM. Discourse on hygiene between hospitalized patients and health care workers as an accepted norm: Making it legitimate to remind health care workers about hand hygiene. *Am J Infect Control.* 2020;48(1):61-7.
- Campbell JI, Pham TT, Le T, Dang TT, Chandonnet CJ, Truong TH, et al. Facilitators and barriers to a family empowerment strategy to improve healthcare worker hand hygiene in a resource-limited setting. *Am J Infect Control.* 2020;48(12):1485-90.
- Lotfinejad N, Peters A, Tartari E, Fankhauser-Rodriguez C, Pires D, Pittet D. Hand hygiene in health care: 20 years of ongoing advances and perspectives. *Lancet Infect Dis.* 2021;21(8):e209-21. Erratum in: *Lancet Infect Dis.* 2021;21(10):e302. Review.
- Khan HA, Baig FK, Mehboob R. Nosocomial infections: epidemiology, prevention, control and surveillance. *Asian Pac J Trop Biomed.* 2017;7(5):478-482.
- Parreira P, Santos-Costa P, Pardal J, Neves T, Bernardes RA, Serambeque B, et al. Nursing students' perceptions on healthcare-associated infection control and prevention teaching and learning experience in Portugal. *J Pers Med.* 2022;12(2):180.
- Footo A, El-Masri M. Self-perceived hand hygiene practices among undergraduate nursing students. *J Res Nurs.* 2016;21(1):8-19.

23. Tem C, Kong C, Him N, Sann N, Chang SB, Choi J. Hand hygiene of nursing and midwifery students in Cambodia. *Inter Nurs Review*. 2019;66(4):523-9.
24. Sultana M, Mahumud RA, Sarker AR, Hossain SM. Hand hygiene knowledge and practice among university students: evidence from Private Universities of Bangladesh. *Risk Manag Healthc Policy*. 2016;9:13-20.
25. Ryu SM, Lim YJ. Knowledge, attitude and performance on the hand washing by pre-practicum nursing students. *J Korea Acad Ind Cooperation Society*. 2013;14(11):5714-22.
26. McLaws ML, Farahangiz S, Palenik CJ, Askarian M. Iranian healthcare workers' perspective on hand hygiene: a qualitative study. *J Infect Public Health*. 2015;8(1):72-9.
27. Armstrong-Novak J, Juan HY, Cooper K, Bailey P. Healthcare personnel hand hygiene compliance: are we there yet? *Curr Infect Dis Rep*. 2023;1-7. Review.
28. Hinkin J, Cutter J. How do university education and clinical experience influence pre-registration nursing students' infection control practice? A descriptive, cross sectional survey. *Nurse Educ Today*. 2014;34(2):196-201.
29. Kim MK, Nam EY, Na SH, Shin MJ, Lee HS, Kim NH, et al. Discrepancy in perceptions regarding patient participation in hand hygiene between patients and health care workers. *Am J Infect Control*. 2015;43(5):510-5.
30. Longtin Y, Farquet N, Gayet-Ageron A, Sax H, Pittet D. Caregivers' perceptions of patients as reminders to improve hand hygiene. *Arch Intern Med*. 2012;172(19):1516-7.
31. Sande-Meijide M, Lorenzo-González M, Mori-Gamarra F, Cortés-Gago I, González-Vázquez A, Moure-Rodríguez L, et al. Perceptions and attitudes of patients and health care workers toward patient empowerment in promoting hand hygiene. *Am J Infect Control*. 2019;47(1):45-50.
32. Seale H, Travaglia J, Chughtai AA, Phillipson L, Novytska Y, Kaur R. 'I don't want to cause any trouble': the attitudes of hospital patients towards patient empowerment strategies to reduce healthcare-acquired infections. *J Infect Prev*. 2015;16(4):167-73.
33. Vijayalakshmi S, Ramkumar S, Narayan KA, Vaithyanathan P. A Goal Unrealized: Patient Empowerment on Hand Hygiene- A Web-Based Survey from India. *J Clin Diagn Res*. 2017;11(4):LC12-6.
34. Eng TY, Eng NL, Jenkins CA, Grota PG. "Did you wash your hands?": a prospective study of patient empowerment to prompt hand washing by healthcare providers. *J Infect Prev*. 2021;22(5):195-202.
35. Lastinger A, Gomez K, Manegold E, Khakoo R. Use of a patient empowerment tool for hand hygiene. *Am J Infect Control*. 2017;45(8):824-9.