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Anahtar Sözcükler:

Uyum; el hijyeni; hemşirelik öğrencileri; gözlemci.

The Effect of Post-Observation Peer Feedback On Nursing Students' Hand Hygiene Knowledge, Beliefs, And Skills

Gözlem Sonrası Akran Geri Bildiriminin Hemşirelik Öğrencilerinin El Hijyeni Bilgisi, İnançları ve Becerileri Üzerindeki Etkisi

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ABSTRACT

Objective: This study aimed to examine how peer feedback using the “Five Moments for Hand Hygiene” method affects hand hygiene knowledge, beliefs, practice, and compliance in nursing students.

Methods: Between January 1st and June 1st, 2022, 109 fourth-year nursing students joined this quasi-experimental study with a pretest-posttest control group using the "Five Moments for Hand Hygiene" technique.

Results: There was statistically significant difference between following-test knowledge scores, hand hygiene belief and practice scores of the students in the intervention and control groups ($p<0.05$). The hand hygiene compliance score in the intervention group (74.96 ± 1.92) was higher than the control group (39.81 ± 4.51).

Conclusion: The observer training according to Five Moments for Hand Hygiene, training, observation in the clinical practice, and peer-feedback positively affect the students' compliance

ÖZ

Amaç: Bu çalışmada hemşirelik öğrencilerinde “El Hijyeni İçin Beş An” yöntemini kullanarak yapılan akran geribildiriminin el hijyeni bilgisini, inançlarını, uygulamalarını ve uyumunu nasıl etkilediğini incelemek amaçlanmıştır.

Yöntem: 1 Ocak-1 Haziran 2022 tarihleri arasında 109 hemşirelik dördüncü sınıf öğrencisi, ön test-son test kontrol gruplu yarı deneysel bu çalışmaya "El Hijyeni İçin Beş An" tekniği kullanılarak katılmıştır.

Bulgular: Müdahale ve kontrol grubundaki öğrencilerin takip testi bilgi puanları, el hijyeni inanç ve uygulama puanları arasında istatistiksel olarak anlamlı fark vardı ($p<0.05$). Müdahale grubunda el hijyeni uyum puanı (74.96 ± 1.92) kontrol grubundan (39.81 ± 4.51) daha yüksekti.

Sonuç: El Hijyeni İçin Beş An'a göre gözlemci eğitimi, eğitim, klinik uygulamada gözlem ve akran geri bildirim yöntemleri öğrencilerin uyumunu olumlu yönde etkilemektedir.

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INTRODUCTION

Healthcare-associated infections remain a major national and international issue due to increased morbidity, mortality, duration of hospital stay, and expense (Sönmez, Öztürk and Abacıgil, 2021). The contaminated hands are the reason for 20-40% of the transmission and spread of microorganisms that induce high virulence and multi-drug resistance in the hospital environment (Chiu and Liao, 2011). Nursing students, as members of the medical staff, undertake a large part of the caring activities during their clinical placement and therefore have an important role in preventing the spread of pathogenic contamination and infectious diseases (Ceylan, Guneş, Baran, Öztürk and Şahbudak, 2020). According to studies conducted in various countries, nursing students frequently have poor hand hygiene (Van de Mortel, Apostolopoulou and Petrikos, 2010). Compliance to hand hygiene can reduce the prevalence of healthcare-associated infections and resistant pathogens, morbidity and mortality, length of hospital stay, and healthcare costs (Guest, Keating, Gould and Wigglesworth, 2019).

Traditional teaching methods lack the sufficiency to result in a long-term behavioral change related to hand hygiene (Molnár et al., 2021). Integrating theory and practice during nursing education can help students learn effective hand hygiene practices (Korhonen, Vuori, and Lukkari, 2019). The World Health Organization (WHO) recommendation for improving hand hygiene is a multimodal strategy (education, training, monitoring, feedback, visual reminders, etc.), and hand hygiene compliance (HHC) has improved worldwide because of these multimodal improvement strategies (Allegranzi et al., 2013). As a result, more efficient training methods than traditional techniques are required to develop effective handwashing skills in nursing students. This study aims to investigate how peer feedback using the “Five Moments for Hand Hygiene” strategy affects nursing students’ knowledge, beliefs, behavior, and compliance with hand hygiene.

Hypothesis of study:

1.H₁=The intervention made with the “Five Moments for Hand Hygiene” method affects the hand hygiene knowledge score of nursing students.

2.H₁=The intervention made with the “Five Moments for Hand Hygiene” method affects the hand hygiene belief of nursing students.

3.H₁=The intervention made with the “Five Moments for Hand Hygiene” method affects the hand hygiene practice of nursing students.

4.H₁=The intervention made with the “Five Moments for Hand Hygiene” method affects the hand hygiene compliance of nursing students.

METHODS

Design

A pretest-posttest control group is used in this quasi-experimental investigation.

Population and Sample

The study was carried out at Nursing School in Türkiye Aegean Region. Data were collected between January 1 and June 1, 2022. Students who took the fourth-year internship course at nursing school in the spring term of the 2021-2022 academic year (193) and volunteered to join the study comprised the study’s population. Power analysis (with G-Power 3.1.9.7) was used to compute the sample size. The significance level was accepted as $\alpha=0.05$ and the effect size as $d=0.5$. As a result, sample size for each intervention and control group was determined to be 51 for 0.80 (1-) power. Given the possibility of withdrawal from the study, it was decided to include 60 students in each group. At control group, 5 students were excluded because they did not complete the following test, 6 students from intervention group were excluded from the study since 4 did not attend the observation training and 2 did not participate in the clinic observation.

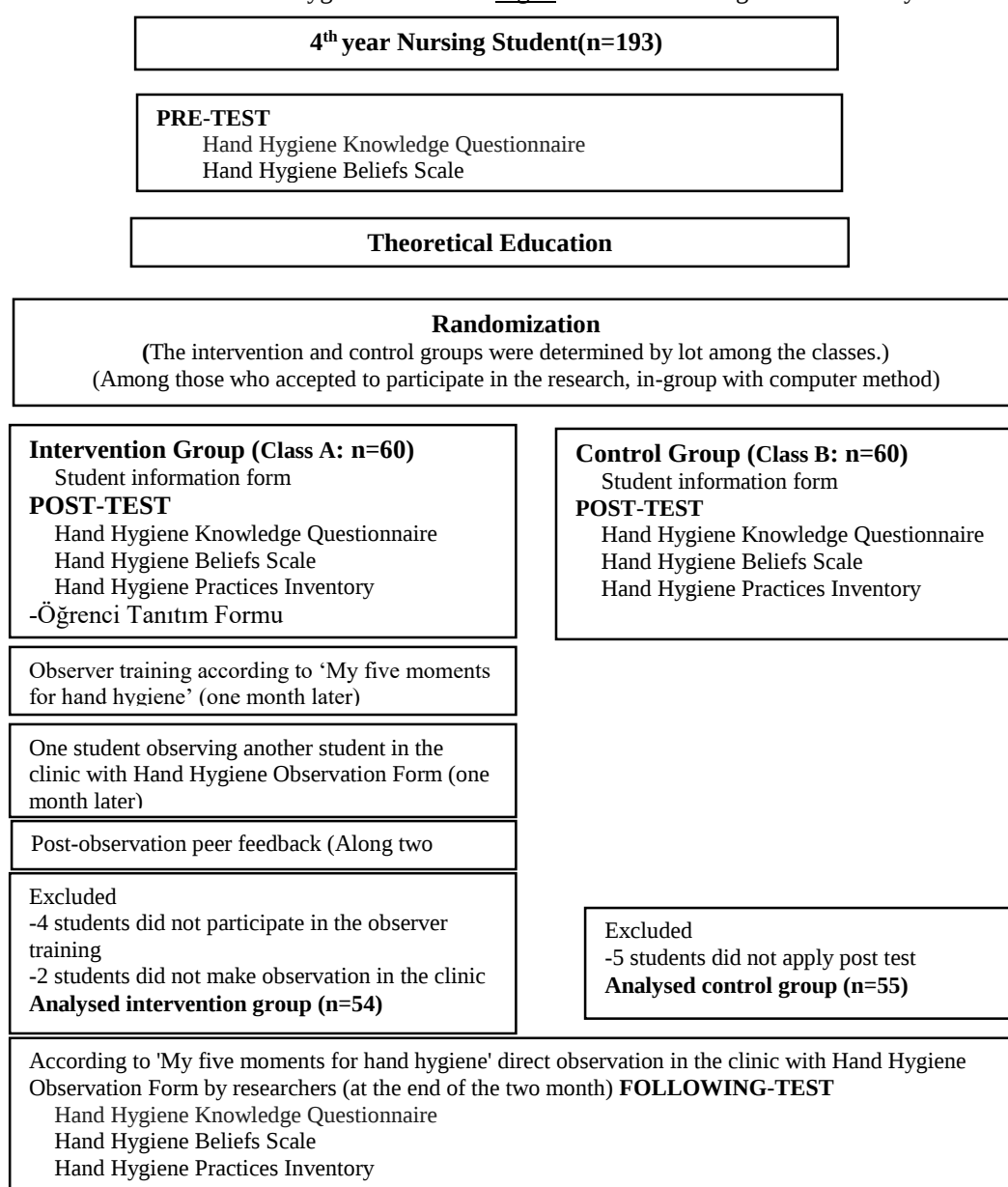
In this faculty, the internship course was given to two classes in the fourth grade. Class A was practicing internships on Sundays, Mondays, and Tuesdays, while Class B was practicing internships on Thursdays, Fridays, and

Saturdays. Students from two classes who participated in the internship practice on different days were divided into intervention and control groups to eliminate the effect of student interaction on the study findings. The courses were numbered, and lots were drawn to determine which one would receive Hand Hygiene Observation. Following the draw, Class A was chosen for the Hand Hygiene Observation. There were 92 students in Class A and 101 students in Class B. Students were selected from the classrooms by randomization method via computer, with 60 students in each group.

The control group of the study got theoretical hand hygiene training (n=60), whereas the intervention group received theoretical hand hygiene training as well as peer feedback utilizing the "Five Moments for Hand Hygiene" observation tool (n=60).

Data Collection

After explaining the aim and content of the study, informed consent was obtained. Before the hand hygiene education, all students in two groups (n=193) were filled on the Hand Hygiene Knowledge Questionnaire (HHKQ), Hand Hygiene Beliefs Scale (HHBS), and Hand Hygiene Practices Inventory (HHPI) pre-tests, and then they received two hours of theoretical hand hygiene education. Presentations and videos prepared based on the latest literature were used as educational materials in the theoretical training. The WHO Hand Hygiene Guide (WHO, 2009) served as the foundation for the theoretical hand hygiene education. [Fig. 1](#) shows a flow diagram of the study.



Control group

Following the theoretical education, the Control Group was filled out Student Information Form, HHKQ (post-test), HHBS (post-test), and HHPI (post-test). No intervention was applied to Control Group students other than theoretical education.

Intervention group

Following the theoretical education, the students filled out the Student Information Form, HHKQ (post-test), HHBS (post-test), and HHPI (post-test). 1 month later, observer training was given by the researchers according to the WHO guidelines so that they could directly observe their peers according to the “Five Moments for Hand Hygiene” approach. This training covered necessary concepts to understand, perform and observe hand hygiene (care environment, patient environment, contact, aseptic procedure, body fluids, etc.), indications of hand hygiene during healthcare delivery (before patient contact, before an aseptic work, after the risk of exposure to body fluids, after patient contact, after contact with the patient’s environment), use of gloves, how to observe hand hygiene, and how to fill in Hand Hygiene Observation Form (HHOF), with a 2-hour ppt. In addition, the students practiced various hand hygiene practices included in the video scenarios and filled out the HHOF. Each video contained different scenarios of “Five Moments for Hand Hygiene”.

One week after the observer training, the most intense hours of treatment and care practices in the clinic were determined (10:00-12:00-14:00). At the appointed hours, each student observed another while they were working in the clinic and filled out the HHOF. Each observation lasted an average of 10-20 minutes. The WHO recommends a maximum of 20 minutes of observation. After each observation, observer students gave feedback to observed students according to “Five Moments for Hand Hygiene”.

The observation and feedback of the students in the intervention group was finished in 2 weeks. Direct observation was used by researchers to assess the HHC of all students in two groups using the “Five Moments for Hand Hygiene” strategy. The researchers who did not know which students were in which classes conducted direct observation two weeks after the completion of the peer feedback process. The most intense hours of treatment and care practices in the clinic were determined for direct observation (10:00-12:00-14:00), and the students were informed in advance of the dates and times to be observed. HHOF was used by the researchers to evaluate each student, who was observed for an average of 10-20 minutes.

After the completion of the researchers’ direct observation (which took two weeks), all students in two groups completed the HHKQ (following-test), HHBS (following-test), and HHPI (following-test).

Data Collection Tools

Student information form

It contains information about age, gender, academic average, clinical practice, the use of alcohol-based hand rubs, and hand hygiene training.

Hand hygiene knowledge questionnaire (HHKQ)

WHO’s hand hygiene questionnaire for healthcare workers (WHO, 2009) was used for assessing knowledge. The form included 3 multiple-choice questions, 12 “yes-no” questions, and 4 “correct-false” questions. 6 of them asked which hand hygiene method was required in the mentioned operations (scrub, wash, or none). Correct answers were counted and recorded for each participant.

Hand hygiene observation form (HHOF)

An observation form of the WHO was used to evaluate hand hygiene performance. The form was adapted by the Department of Performance Management and Quality Improvement of the Turkey Ministry of Health in line with the WHO Guidelines on Hand Hygiene in Health Care. It included name of observed group, observation date, handwashing behaviors and time, the title of the observed person, and Five Moments of Hand Washing information. Each of these Five Moments of Handwashing Indications was evaluated as “Washed-Not”. Handwashing behaviors of employees using waterless hand sanitizer were recorded as “Washed”. Hand hygiene compliance was computed with HHOF.

Hand hygiene beliefs scale (HHBS)

It was developed to determine individuals' beliefs about hand hygiene. The study on the reliability and validity of the Turkish version of scale was carried out by Karadağ et.al. (2016). It has 22 items, 19 on beliefs about hand hygiene, 3 on the perception of the importance of hand hygiene (Van de Mortel et al., 2010). The HHBS is a 5-point Likert-type scale (1-5). The total score ranges between 22 and 110, and a high score indicates a positive belief in hand hygiene. Cronbach's alpha was 0.76 in the Turkish validity and reliability study, as 0.70 in this study.

Hand hygiene practices inventory (HHPI)

It was developed by Thea Van de Mortel (2009) to identify the situations in which people practice hand hygiene. Its Turkish validity and reliability study was conducted by Karadağ, Yıldırım and İşeri (2016). The HHPI is a 5-point Likert-type scale (1-5) consisting of 14 items. The total score ranges between 14 and 70; a high score indicates that hand hygiene practices are always carried out. In the Turkish validity and reliability study, Cronbach's alpha was 0.85, in this study, it was 0.82.

Data Analysis

SPSS 21.0 (IBM SPSS Statistics 21 software (Armonk, NY: IBM Corp.) was used for all statistical analyses. Continuous variables were characterized by the mean±standard deviation, and minimum–maximum values, categorical variables were as number and percent. Shapiro Wilk test was used for the determination of normal distribution. Differences in demographic data between the groups were analyzed with Chi-square test (categorical variable) and Independent Samples T-Test (continuous variable). The Independent Samples T-Test was used when the parametric test assumptions were met to compare independent groups. Analysis of variance for Repeated measures was used when parametric test assumptions were met to compare dependent groups. Statistical significance was defined as $p < 0.05$. After direct observation, the formula "Compliance (%) = (Actions/Indication) x 100" determined by the WHO was used to determine each student's HHC. There is no missing data.

Ethical Considerations

Ethical approval was obtained from Pamukkale University Non-Interventional Clinical Research Ethics Committee (Date/No: 2022-E60116787-020-175632), and written permission was obtained from the nursing school management. In addition, the nursing students were informed about the aim of the study, and their written and verbal informed consent was obtained. The study was conducted according to Helsinki Declaration.

RESULTS

Demographic Characteristics

The study was completed with 109 participants (the intervention group-54, the control group-55). The mean age was 22.16 ± 1.37 in the intervention group and 22.32 ± 1.10 in the control group. The academic average of the students was 3.09 ± 0.29 out of 4 in the intervention group and 3.07 ± 0.21 in the control group. Most students were female in both groups (intervention group=83.3%, control group=78.2%). It was determined that more than half of the students in both groups received hand hygiene education, had good knowledge levels, and routinely used alcohol-based hand rubs for hand hygiene. In terms of demographic characteristics, there was no significant difference between the groups ($p > 0.05$) (Table 1).

Table 1. Demographic Characteristic Between Groups (n = 109)

	Intervention group (n=54)		Control group (n=55)		Statistical analysis	
	$\bar{X} \pm SD$		$\bar{X} \pm SD$		t	p*
Age	22.16 ± 1.37		22.32 ± 1.10		-.674	0.502
Academic grade average	3.09 ± 0.29		3.07 ± 0.21		.053	0.581
	n	%	n	%	χ^2	p**
Gender						
Female	45	83.33	43	78.18	0.465	0.495
Male	9	16.67	12	21.82		
Internship clinic						
Internal clinic	16	29.63	11	20.0	2.761	0.430
Surgical clinic	16	29.63	20	36.36		
Intensive care unit	11	20.37	16	29.09		
Specialized units	11	20.37	8	14.55		
Education on hand hygiene						

Yes	38	70.37	36	65.45	0.302	0.583
No	16	29.63	19	34.55		
Knowledge level about hand hygiene practices						
Good	34	62.96	41	74.56	1.703	0.192
Middle	20	37.04	14	25.44		
Routine use of alcohol-based hand rub for hand hygiene						
Yes	47	87.03	46	83.64	0.252	0.616
No	7	12.97	9	16.36		

*Independent Samples T-Test **Pearson Chi-Square $\bar{X}$; Mean, SD; standard deviation

Hand Hygiene Knowledge

Students' hand hygiene knowledge was evaluated with a pre-test before the theoretical education, a post-test after the theoretical education, and a following test after the direct observation to evaluate hand hygiene in clinical practice. There was no statistically significant difference between two groups before and after the theoretical education ($p>0.05$). The mean following-test knowledge score of the students in the intervention group was 22.07 ± 1.77 , control group was 16.40 ± 2.06 , there was a statistically significant difference between the two groups ($t=15.340$, $p=0.001$). There was a statistically significant difference between the intra-group hand hygiene pre-test, post-test, and following-test knowledge scores in the intervention and control groups ($p=0.001$). While the average knowledge test score in the intervention group was highest in the following-test (22.07 ± 1.77), the control group had the lowest score in the following-test (16.40 ± 2.06) (Table 2).

Table 2. Comparison of Total Mean Scores of Hand Hygiene Knowledge Test in Intervention and Control Groups

	Intervention group (n=54)		Control group (n=55)		Test results t^*	p value
	$\bar{X}\pm SD$	Med (Min-Max)	$\bar{X}\pm SD$	Med (Min -Max)		
Pre-test	16.68 ± 1.98	17 (12-21)	16.74 ± 2.03	17 (14-20)	-.156	0.876
Post-test	17.55 ± 1.89	17 (12-21)	17.58 ± 1.99	18 (11-20)	-.071	0.944
Following-test	22.07 ± 1.77	22 (16-25)	16.40 ± 2.06	17 (9-19)	15.340	0.001
Within groups analysis	$p=0.001$ (F=116.161)**		$p=0.001$ (F=9.720)**			

* Independent Samples T-Test , ** Repeated measures Anova test, $\bar{X}$; Mean, SD; standard deviation, Med; Median, Min; Minimum, Max; Maximum

Hand Hygiene Beliefs and Hand Hygiene Practices

The average pre-test HHBS of the students were 89.48 ± 7.04 for the intervention group, 88.03 ± 11.82 for the control group, and the average post-test HHBS were 92.72 ± 8.24 for the intervention group, and 90.89 ± 8.92 for the control group. There was no statistically significant difference between two groups in terms of pre-test and post-test HHBS averages ($p>0.05$). The average following-test HHBS in the intervention group (97.01 ± 6.79) was significantly higher than in the control group (91.30 ± 9.31) ($p=0.001$). In addition, while the HHBS in the intervention group increased statistically ($p=0.001$), there was no significant difference between the pre-test, post-test, and following-test scores for hand hygiene belief in the control group ($p=0.064$) (Table 3).

The average pre-test HHPI score was 66.01 ± 4.15 in the intervention group and 67.83 ± 3.88 in the control group, and a statistically significant difference was found between two groups ($p=0.002$). No significant difference was found in terms of HHPI mean scores in the intervention and control groups after the theoretical education (post-test) ($p=0.464$). The average following-test HHPI score in the intervention group students (68.29 ± 1.95) was significantly higher than the control group students (66.78 ± 4.51) ($p=0.025$). While the average HHPI score of in the intervention group increased statistically significantly ($p=0.001$), the average score in the control group decreased in the following test (Table 3).

Hand Hygiene Compliance

Following direct observation, the HHC was computed. In the intervention group (74.96 ± 1.92) HHC was higher than the control group (39.81 ± 4.51) and there was a statistically significant difference ($t=7.884$, $p=0.001$) (Table 3).

Table 3. Comparison of Total Mean Scores of Hand Hygiene Beliefs (HHBS), Hand Hygiene Practices Inventory (HHPI) and Hand Hygiene Compliance in Intervention and Control Groups

	Intervention group (n=54)		Control group (n=55)		Test results t*	p value
	$\bar{X} \pm SS$	Med (Min- Max)	$\bar{X} \pm SS$	Med (Min- Max)		
HHBS Pre-test	89.48 $\pm$ 7.04	90 (78-102)	88.03 $\pm$ 11.82	90 (50-105)	.773	0.441
HHBS Post-test	92.72 $\pm$ 8.24	93 (74-106)	90.89 $\pm$ 8.92	94 (7108)	1.113	0.268
HHBS Following-test	97.01 $\pm$ 6.79	97.5 (82-110)	91.30 $\pm$ 9.31	90 (60-108)	3.650	0.001
Within groups analysis	p=0.001 (F=25.525)**		p=0.064 (F=2.913)**			
HHPI Pre-test	66.01 $\pm$ 4.15	67 (54-70)	67.83 $\pm$ 3.88	70 (53-79)	-2.358	0.002
HHPI Post-test	67.94 $\pm$ 3.03	69 (58-70)	68.41 $\pm$ 3.66	70 (54-70)	-.735	0.464
HHPI Following-test	68.29 $\pm$ 1.95	69 (62-70)	66.78 $\pm$ 4.51	68 (44-70)	2.266	0.025
Within groups analysis	p=0.001 (F=15.416)**		p=0.013 (F=5.163)**			
Hand Hygiene Compliance	74.96 $\pm$ 21.92	75(25-100)	39.81 $\pm$ 24.51	38(0-100)	7.884	0.001

*Independent Samples T-Test **Repeated measures Anova test

 $\bar{X}$; Mean, SD; standard deviation, Med; Median, Min; Minimum, Max; Maximum

DISCUSSION

This quasi-experimental study examined senior nursing students' hand hygiene knowledge, beliefs, behaviors, and compliance with WHO's "Five Moments for Hand Hygiene". While there was no difference between the average knowledge scores in the intervention and control groups before and after the training, it was found that the average following-test scores of the intervention group were significantly higher. In addition, there was a statistically significant difference between the average intra-group scores of both classes. Education is one of WHO's multimodal hand hygiene improvement strategies (WHO, 2020). Korhonen et al. (2019) aimed at increasing the evidence-based hand hygiene knowledge of nursing students in their studies, stating that theoretical education and practice affected the hand hygiene knowledge of the students, but reinforcement was also needed during clinical training to learn the skill.

When the mean scores of hand hygiene beliefs were examined, while there was no difference between two groups before and after the training, the following-test mean scores of the intervention group were significantly higher, and their mean scores increased statistically significantly. Personal beliefs and practices vital in transforming effective hand-washing strategies into real behavior and believing in the value and necessity of hand hygiene is a key aspect that supports HHC (Ceylan et al., 2020). At this point, the study's findings are consistent with other studies' findings (Ceylan et al., 2020; Karadağ et al., 2016). Oyapero and Oyapero (2018) investigated nursing students' hand hygiene beliefs, discovered that poor hand hygiene practices of senior colleagues were associated with hand hygiene beliefs, and concluded that demonstration and clinical practice were the most effective teaching methods. In the hospital where this study was conducted, nurses adhered to the WHO's hand hygiene strategy, and the infection control committee nurses were constantly auditing hand hygiene. At this point, it can be concluded that the clinical practice setting supports students' hand hygiene behaviors and that peer observation and feedback following the theoretical training have a positive impact on students' hand hygiene beliefs.

The average hand hygiene practice following-test score in the intervention group was significantly higher than the control group, the mean score of the intervention group increased statistically, while the mean score of the control group decreased in the following-test. It may be helpful for the intervention group to receive observation training, practice with scenarios, observe each other, and give feedback after observation, in putting the knowledge into practice. Studies have emphasized the importance of bedside teaching (Tavolacci et al., 2008), educational methods and materials that focus on international guidelines (Huang, Xie, Zeng, Law, and Ba-Thein, 2013), and role models (such as peers, healthcare professionals) (Ibrahim and Elshafie, 2016).

In a systematic review aiming to determine the strategies used to teach the theory and practice of hand hygiene to healthcare students, it was stated that the theoretical knowledge and application skills of the students on hand hygiene were found to be insufficient and educational inputs could increase knowledge and practice (Purssell and Gould, 2022).

Hand hygiene compliance was statistically significantly higher in the intervention group than in the control group. At an observational study evaluating the HHC of nursing students with the WHO's "Five Moments for Hand Hygiene", HHC was found to be very low (Løyland, Peveri, and Hessevaagbakke, 2020). Sundal et al. (2017) examined student nurses' HHC in clinical placements in their study, HHC was 83.5%, the highest HHC was after contact with the patient's environment, after patient contact, and after the risk of exposure to body fluids. Compliance was the lowest before contacting the patient or the patient's environment, and before clean/aseptic procedures. In a study, examining HHC throughout the COVID-19 pandemic, nursing students' HHC was found to be 80.5% (Sandbekken, Hermansen, Utne, Grov and Loyland, 2022). According to a study (Martos-Cabrera et al., 2019), variables such as hand hygiene education, involvement in hand hygiene campaigns, and hand hygiene knowledge all influence HHC. Conversely, in another study, a rise in hand hygiene behavior was observed depending on the hand hygiene training of the students, but no relationship was found between hand hygiene knowledge, beliefs, and behaviors (Jeong and Kim, 2016). In this study, the students were trained to develop their HHC, observed, and gave feedback to each other within the framework of the WHO's "Five Moments for Hand Hygiene" form and principles. As Purssell and Gould (2022) suggests, educational initiatives have increased knowledge and the transfer of knowledge into practice. Multidimensional interventions such as hand hygiene education (Fouad and Eltaher, 2020), scenario-based videos, peer observation, and feedback used in this study are empirically tested strategies for improving HHC (Ceylan et al., 2020). Knowing that they are being observed can affect students' behavior (Ibrahim and Elshafie, 2016). In addition, it is stated that the effect of being observed (Hawthorne effect) improves HHC (McCarney et al., 2007). In this study, educational intervention and observation were found to be effective in improving hand hygiene compliance.

One of the limitations is the study sample consisted of a nursing school student in the West of Türkiye, so the results cannot be generalized. The students reported their behaviors by themselves, raising the possibility of social desirability response bias. The fact that data collection tools are based on self-report is another limitation of the study. Although the WHO has released instructions for utilizing the HHOF, hand hygiene variances in the observers' unique perceptions are likely. Bias might exist between nursing students due to being in the same class, friends, or not friends. One of the study's strengths is that having students serve as observers appears to provide students with more insight and new information about hand hygiene and infection control.

CONCLUSIONS

Hand hygiene compliance in the intervention group was statistically significantly higher than control group. A statistically significant difference was between the intra-group hand hygiene pre-post-following-test knowledge mean scores in two groups. While the average knowledge test score in the control group was the highest in the following-test, the lowest score of the control group was in the following-test. While the hand hygiene beliefs and practices scores in the intervention group increased significantly, the mean scores in the control group decreased in the following-test. The results showed that the observer training according to Five Moments for Hand Hygiene, training, observation in the clinical practice, and peer-feedback positively affect the students' hand hygiene compliance.

Author Contributions

Concept and design: Ö.F., A.Ş.Z. Data collection: Ö.F., A.Ş.Z., S.A. Data analysis and interpretation: Ö.F., A.Ş.Z. Writing manuscript: Ö.F., A.Ş.Z., S.A. Critical review: Ö.F.

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