Cukurova Medical Journal
ÇUKUROVA ÜNİVERSİTESİ TIP FAKÜLTESİ

Cukurova Med J 2020;45(2):604-612
DOI: 10.17826/cumj.668515

ARAŞTIRMA / RESEARCH

Effect of web-assisted learning and peer learning on the stoma care-related knowledge and skills of nursing students

Web destekli eğitim ve akran eğitimininin hemşirelik öğrencilerinin stoma bakımı bilgi ve becerilerine etkisi

Sezgi Kaplan[1], Hilal Tüzer[2]

[1]Ankara Unıversity Faculty of Medicine, Ankara, Turkey
[2]Ankara Yıldırım Beyazit University, Faculty of Health Sciences, Department of Nursing, Ankara, Turkey

Cukurova Medical Journal 2020;45(2):604-612

Abstract

Purpose: The aim of this study was to compare the effects of web-assisted learning and peer learning on the stoma care-related knowledge and skills of nursing students.
Materials and Methods: The students were divided into two groups as a web-assisted learning group (n=33) and a peer learning group (n=34) in the study. A theoretical course about stoma care was first provided to the students during the study and an initial test then administered. A video was produced for the web-assisted learning group using a low reality simulator by the investigator at the skills laboratory; this video was then loaded to the Edpuzzle software and the students asked to watch it. In the peer learning group, the peer trainers received stoma care training from the investigator and underwent practical training with the low reality simulator. These peer trainers then had the peer learning group perform the skills at the skills laboratory with a low reality simulator and evaluated the students. All the students in the two groups then performed stoma care with the low reality simulator and were evaluated by the investigator. A final test was administered to all students.
Results: The mean knowledge score for the pre-test and post-test was 71.21±12.50 and 77.27±9.69, respectively, in the Web-assisted Learning Group and 67.50±10.46 and 78.24±8.52, respectively, in the Peer Learning Group. There was a significant increase in the mean knowledge test score following training in both groups.
Conclusion: According to the study results, the knowledge score and skill score increased in both groups. We recommend the use of web-assisted learning and peer learning in nursing education.
Keywords:. Education, nursing, nursing training, peer learning, web-assisted learning, stoma care

Öz

Amaç: Bu çalışma, hemşirelik öğrencilerinin stoma bakımına yönelik bilgi ve becerilerine web destekli öğretim ve akran eğitiminin etkisinin karşılaştırılması amacıyla yapılmıştır.
Gereç ve Yöntem: Çalışmada, öğrenciler web destekli eğitim grubu (n=33) ve akran eğitimi grubu (n=34) olmak üzere iki gruba ayrıldı. Öncelikle tüm öğrencilere stoma bakımı hakkında teorik ders anlatıldı ve daha sonra ön test uygulandı. Web destekli eğitim grubunda; düşük gerçeklikli simülatör ile beceri laboratuvarında stoma bakımına yönelik araştırmacı tarafından video çekildi ve video Edpuzzle programına yüklenerek gruptaki öğrencilerin videoyu izlemesi sağlandı. Akran eğitim grubunda ise; araştırmacı tarafından akran eğiticilerine akran eğitimi, stoma bakım eğitimi anlatıldı ve düşük gerçeklikli simülatör ile uygulama yaptırıldı. Akran eğiticileri, düşük gerçeklikli simülatör ile akran eğitimi grubuna stoma bakımını yaptırarak öğrencileri değerlendirdi. Daha sonra her iki gruptaki öğrencilerin tamamı araştırmacı gözleminde düşük gerçeklik simülatör ile stoma bakım uygulamasını yaparak ve araştırmacı tarafından değerlendirildi. Tüm öğrencilere son test uygulandı.
Bulgular: Bilgi puanı ortalaması ön test ve son test için Web Destekli Eğitim Grubu' nda 71.21±12.50 ve 77.27±9.69; Akran Eğitimi Grubu' nda sırasıyla 67.50±10.46 ve 78.24±8.52 olarak bulundu. Her iki grup için eğitim sonunda bilgi testi puan ortalamalarının anlamlı düzeyde arttığı gözlendi.
Sonuç: Araştırmanın sonucuna göre; her iki grubunda bilgi puanı artmıştır. Hemşirelik eğitiminde web destekli eğitim ve akran eğitimi yönteminin kullanılması önerilmektedir.
Anahtar kelimeler: Eğitim, hemşirelik, hemşirelik eğitimi, akran eğitimi, web destekli eğitim, stoma bakımı.

Yazışma Adresi/Address for Correspondence: Dr. Hilal Tüzer, Ankara Yıldırım Beyazit University, Faculty of Health Sciences, Department of Nursing, Ankara, Turkey E-mail: hilaldemircan@gmail.com
Geliş tarihi/Received: 31.12.2019 Kabul tarihi/Accepted: 01.04.2020 Çevrimiçi yayın/Published online: 20.05.2020

INTRODUCTION

Nursing is a health care discipline that merges theoretical and practical information and includes both science and art, aiming to define the physical, psychosocial, cultural and spiritual needs of the population with a holistic and humanistic approach[1]. Nursing educators are professionals who constantly review the education curriculum, update their knowledge, and make sure that the students obtain the necessary information and skills[1,2].

While knowledge accumulation is sufficient for the students in theoretical nursing education, various problems are experienced during clinical education. A literature review reveals problems such as short laboratory durations, ineffective use of the laboratory, the lack of expert trainers, lack of repetition, and crowded groups[3,4]. There are also inadequacies in clinical education due to patient-related problems in the clinic, institution-related problems, negative behaviors of health professionals during clinical applications, and the student's related lack of self-confidence[3,4,5,6]. The focus is usually on traditional teaching methods based on classroom lectures and passive learning in nursing education[3]. It is now necessary to add active student-based training methods to the traditional training systems in the nursing education curriculum[7,8].

Student-centered teaching methods are used to encourage active student participation and creative thinking. One of these methods is "Web-assisted Learning" that the student can access by using technological advances[9,10]. The use of web-assisted learning is common in both our country and in the world and has been employed in many nursing studies[11,13]. Various studies on web-assisted support have reported increased student communication, increased skill level, increased self-confidence, increased self-awareness of the student's strong and weak aspects, increased learning and a positive contribution to the professional development of the student[12,13,14,15].

Another method is "Peer Learning" where peers learn from each other with active student participation and where the students take responsibility for learning[11]. The critical thinking power, psychomotor skills, cognitive development, clinical skills and academic success of the student increase with this active nursing training[4]. Another active learning method used effectively with students is peer learning. Peer learning is "sharing of knowledge and skills on a fully voluntary basis and in an intuitional manner without any planning or evaluation, by persons with social characteristics that are the same as those of the training group"[16]. Peer learning studies in nursing have been reported in the literature to have positive effects such as increased motivation, increased knowledge and skills, improved communication skills, improved critical thinking, increased self-confidence, better ability to observe, distribution of knowledge, and professional development[16,1,18,19]. Other studies on peer learning have also found increased academic knowledge and skills; decreased anxiety, better social communication; increased learning experiences, and creation of self-development opportunities with positive or negative feedback[17,19,20,21,22].

Nursing care has become more professional with the development of educational opportunities, easier access to information and increased use of interpersonal communication skills. Education is quite important in nursing, an occupation where professionalism is at the forefront[23]. The Ministry of Health Regulation published in the Official Gazette number 27910 in 2011 has enabled specialization in nursing with the relevant training[24]. One of these specialization areas is "Stoma and Wound Care Nursing"[24,25].

Stoma care is one of the most important applications of the nursing profession and requires professional training so that the physiological and psychological health of the patients can be maintained[26]. Stoma care nurses play an important role in stoma care and patient education[26,27]. The provision of stoma care by a professional decreases the rate of potential stoma complications[28]. Stoma care nurses help to increase the patient's quality of life but stoma patients can experience many physical and psychological problems during this care. The person caring for the stoma therefore needs to be a professional in the field[29].

Several studies from the literature have reported that guidance of stoma patients in stoma care by nurses and including the patient in the care increased the quality of life of these patients and supported their independence[30,31]. In the Zimnicki et al. (2018) study on the stoma care knowledge and skills of nursing students, an initial knowledge-based initial test was administered, practical training was provided, and a final test was administered at the end of the semester. At the end of the study, nursing students were found

to lack knowledge and skills in stoma care and also stated they did not feel confident[32]. In a similar study on nursing students, stoma care training was provided with web-assisted distance education and a pre- and post-test were administered to evaluate knowledge. The study found that web-assisted distance education increased the knowledge and skills of the students[33]. Braga et al. (2016) developed a virtual training website to teach stoma care in a web-assisted manner in another study. Students who had undergone undergraduate training accessed this site and learned about stoma care training. The students' knowledge and skills related to stoma care were found to have increased after training[34].

The aim of the study was to compare the effects of web-assisted learning and peer learning on the stoma care-related knowledge and skills of nursing students. The subject has not been previously evaluated in the literature, making this an original study. We believed that the results of the study would point to the more effective of the training methods for nurses, who play an important role in stoma care. The expectations from the study were to increase the ability of the students to learn about professional care and stoma care and to increase awareness on the subjects.

Study hypotheses are as follows. Hypotheses related to knowledge are ;

$H_{0\text{-}1}$: There is no difference between web-assisted learning and peer learning regarding the stoma care-related knowledge of the students.
$H_{1\text{-}1}$: There is a difference between web-assisted learning and peer learning regarding the stoma care-related knowledge of the students.
Hypotheses related to skill are:
$H_{0\text{-}2}$: There is no difference between web-assisted learning and peer learning regarding the stoma care-related skills of the students.
$H_{1\text{-}2}$: There is a difference between web-assisted learning and peer learning regarding the stoma care-related skills of the students.

MATERIALS AND METHODS

This study was carried out with first year students who took the Fundamentals of nursing lectures the nursing department in a university. No specific sample was selected for the study and all students who accepted to participate were included in the study group. Our universe consisted of 124 students but there were only 67 volunteers participating in the study in the end.

The study students were randomized according to the student number (odd and even number groups). The students participated in the study were divided into two groups as web-assisted learning group (n=33) and the peer learning group (n=34).

The study inclusion criteria were: voluntary acceptance of study participation, and participation in theoretical lectures on stoma care education. The study exclusion criteria were to be a health high school graduate and to take the lectures Fundamentals of nursing for the second time.

The ethical principles established in the Helsinki Declaration were followed. Written permission was obtained from the Nursing Department Head Office and the Ankara Yildirim Beyazit University Ethics Committee with decision no 2018-35 dated 23 February 2018 to conduct the study. In addition, informed consent was obtained from all the students included in the study after study information was provided.

Data collection tools

The data collection forms consisted of "The Sociodemographic Characteristics Form", "The Stoma Care Knowledge Level Evaluation Form", and the "Stoma Care Performance Evaluation Form".

Sociodemographic characteristics form

This form was designed by the researchers, and the form included 10 questions such as the student's age, gender, whether the laboratory training hours were adequate and whether he/she had previously observed stoma care.

Stoma care knowledge level evaluation form

This form was prepared by the researchers after a review of the literature[35,36,37,38] and included 20 expressions related to stoma care. This expression were scored over 100 points. Each expression included 'True, False, Don't know' options. Correct options were given 1 and incorrect options 0 points, to provide a total possible score of 100 points.

Stoma care skill evaluation form

This form was prepared by the researchers, in light of the literature[35,36,37,38,39]. The skill evaluation form consisted of 27 steps. Each item in the performance evaluation form steps included the "Not observed (Omission/Error) and Observed (Correct/Full)" options. Accordingly the not observed items received

"0" points, the omission/error items "1" point and the observed items "2" points.

In order to ensure the content validity of the data collection forms in terms of validity, three specialists who completed their doctorate in nursing were taken and arrangements were made according to their suggestions.

Study procedure

During the application stage of the study, the stoma care course was provided to all students in the form of 1 hour of theoretical work and 2 hours of laboratory practice by the relevant instructor. All students were then administered an initial test that evaluated the level of knowledge on stoma care. This test completed the in approximately 15–20 min.

In the web-assisted learning group (WLG) (n=33), a video was produced by the investigator on stoma care using the low reality simulator at the Principles of Nursing skills laboratory for the students. The video included procedural steps for stoma care with both verbal information and demonstrations. The video was placed in the 'Edpuzzle' program which can be accessed via the internet or uploaded to devices. A class code was determined in the program and provided to the students. The WLG students were then provided information on using the program, creating a user name, creating a password, accessing the class in the program and how to access the video. Whether the student fully watched the video or not was monitored through the system.

In the peer trainers group**,** the participants were 7 voluntary peer trainers from the fourth-year students. The voluntary peer trainers received training from the investigator. The students were administered an initial test after the peer learning. This was followed by a 40-minute Powerpoint presentation on stoma care with theoretical knowledge and demonstrations. The peer trainers performed the stoma care demonstration with a low-reality simulator and evaluated the students with a skill evaluation form. A final test was administered 1 week later.

In the peer learning group (PLG) (n=34) the studies underwent peer learning. The PLG students were provided feedback after their stoma care skills were evaluated by the students who were peer trainers, under the guidance of the investigator. The PLG students taking the Principles of Nursing class shared their knowledge and skills regarding stoma care with each other during the skills laboratory.

Finally, all the students performed stoma care with a low reality simulator in the skills laboratory and the stoma care skill evaluation form was then used by the investigator for evaluation. A final test was administered to both groups. This test completed the in approximately 15-20 min.

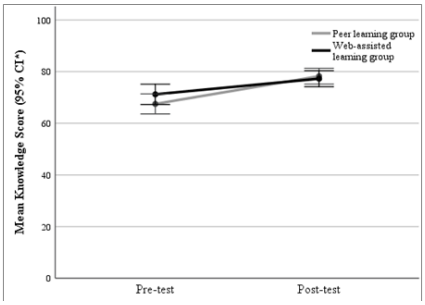

Figure 1 Mean initial test and final test knowledge scores by group (*Confidence Interval)

Statistical analysis

The age distribution of the two groups was compared with the Mann-Whitney U test while the distribution of categorical features such as gender was compared with the chi-square test. The change in the knowledge test scores over time was evaluated with the two-way combined ANOVA test. The score changes were similar and the change within the group over time was therefore analyzed with the paired t test, while Student's t test was used to evaluate the changes between the groups and the skill scores. The statistical significance level was accepted as$p<0.05$. The IBM SPSS Statistics 22.0 software was used for statistical analyses, calculations and graph production.

RESULTS

The median age of the study students was 19 years in the peer learning group (PLG) and again 19 years in the web-assisted learning group (WLG) (Table1). Females made up 94.1% (n=32) of the PLG and 84.8% (n=28) of the WLG. The two groups were similar regarding age and gender distribution ($p=0.430$ and $p=0.259$, respectively). Internet access was available for 97.1% (n=33) of the PLG and 97.0% (n=32) of the WLG.

The mean knowledge test scores for the initial test and final test were 67.50±10.46 and 78.24±8.52, respectively, in the PLG and 71.21±12.50 and 77.27±9.69, respectively, in the WLG (Table 2).

There was a significant increase in the mean knowledge test score after the training in both groups ($p<0.001$ and $p=0.002$, respectively, Figure 1). The increase in knowledge score was similar in the two groups ($F=2.994$, $p=0.088$). The mean skill score was 90.55±7.32 in the PLG and 89.34±7.46 in the WLG (Table3). There was no statistically significant difference between the skill scores of the groups ($t=0.674$, $p=0.502$) (Figure 2).

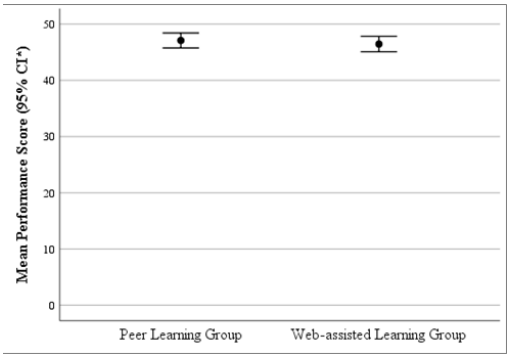

Figure 2. Mean skill score of the groups (*Confidence Interval).

The mean knowledge score of the peer learning group was 75.00±5.77 on the initial test and 93.57±5.56 on the final test (Table 4). The final test scores were statistically significantly higher than the initial test scores ($t=20.140$, $p<0.001$).

DISCUSSION

The number of students stating that they voluntarily chose the nursing occupation was larger in the peer training group in this study (n_{PLG}:25 vs n_{WLG}:22); but there was no statistical significance. A study where the satisfaction of 76 nursing students with their chosen profession was evaluated has shown that nursing was chosen voluntarily for various reasons (helping others, image in the society, the chance to work with physicians, appropriate income level)[40]. This result supports the opinion obtained from our study that nursing students generally choose their profession willingly.

In this study results indicate that the mean knowledge score of the students was statistically significantly higher at the final test at the end of training than the initial test in the WLG ($p=0.002$, See Table 2). Bales measured the ostomy care knowledge of working nurses in 2010 by creating an internet-based training database. They found that video training increased the knowledge level of the nurses and provided an opportunity for nurses to review their current knowledge[33].

Table 1. Sociodemographic characteristics of the students

	Peer learning [n=34]	Web-assisted learning[n=33]	Test statistics	p
Age,years[median (min-max)]	19(18-22)	19(18-31)	Z=0.789	0.430
Gender,Female [n(%)]	32(94.1)	28(84.8)	–	0.259
Did you choose nursing school willingly? [n(%)]			χ^2=0.120	0.729
Yes	25(73.5)	22(66.7)		
No	9(26.5)	11(33.3)		
Do you have internet access?:[n(%)]			–	1.000
Yes	33(97.1)	32(97.0)		
No	1(2.9)	1(3.0)		
Are the laboratory training hours adequate? [n(%)]			χ^2=0.131	0.718
Yes	15(44.1)	17(51.5)		
No	19(55.9)	16(48.5)		

PLG: Peer Learning Group, WLG: Web-assisted Learning Group; Z:Mann-Whitney Utest result, χ^2:Yates chi-square test result. Other p values are from Fisher's exacttest.

Table 2. Knowledge test score by group

	PLG[n=34]	WLG[n=33]		
	Mean±SD	Mean±SD	t*	p
Initial Test Knowledge Score	67.50±10.46	71.21±12.50	1.320	0.192
Final Test Knowledge Score	78.24±8.52	77.27±9.69	0.432	0.667
Test Statistics; p	t**=5.442;<0.001	t**=2.306;0.002		

PLG: Peer Learning Group, WLG: Web-assisted Learning Group, SD: standard deviation; t*: Student t test result, t**:Matchedttest result

Table 3. Skill score by group

	PLG[n=34]	WLG[n=33]		
	Mean±SS	Mean±SS	t*	p
Application Score	90.55±7.32	89.34±7.46	0.674	0.502

PLG: Peer Learning Group, WLG: Web-assisted Learning Group, SD:standard deviation; t*:Student t test result

Table 4. Distribution of the knowledge test and skill scores of the peer learning group

	Mean±SD	Median(min-max)
Initial Test Knowledge Score	75.00±5.77	75(70-85)
Final Test Knowledge Score	93.57±5.56	95(85-100)
Skill Score	99.45±0.938	100(98.08-100)

SD: standard deviation; min: minimum; max: maximum

Chuang at al. loaded training videos on the phones of 87 nursing students and found that the group watching videos had increased knowledge and skill levels[41]. In the Sowan and Idhail web-assisted learning study on nurses' drug management knowledge and satisfaction with training, the nurses were found to have increased knowledge after the training. They also reported that the nurses were happy with web-assisted learning[42]. Öztürk and Dinç have observed that students receiving web-assisted learning had a statistically significant increase in their knowledge and skills, in their web-assisted urinary catheterization study[13]. The result of our study results are similar to those in the literature. Web-assisted learning can be used to increase the effectiveness of traditional learning by the student, as and when required.

We found that the mean knowledge score of the PLG increased in a statistically significant manner after the final test when compared with the initial test. Versteeg et al. compared the knowledge scores of a total of 317 medical students in 2019 by dividing them into traditional learning and peer learning groups. The knowledge level was reported to be higher in the peer learning group[43]. Literature studies have shown that peer learning increases the knowledge, skill and professional development of nursing students[17,22,44]. Other studies have reported peer learning to be an effective teaching/learning method for subjects who provide/receive training. The result of our study was consistent with other studies in the literature.

Sadowski et al. have reported in their study on pharmacy and physical therapy students that the knowledge and skills of both groups on the use of walkers, crutches and canes increased after the relevant peer learning[45]. A study measuring the effects of peer learning on the knowledge and healthcare beliefs of undergraduate students regarding breast cancer screening found that peer learning increased the relevant knowledge level and made the students more aware[46]. It was seen that peer learning could be used not only for lectures and also for social activities. A study on using peer learning to provide diabetes information as related to community health also found it to be effective, with the knowledge levels increasing in the peer learning subjects[47].

There was no statistically significant difference between the mean skill scores in the PLG and WLG in this study. There are only a few studies in the literature where web-assisted learning and peer learning have been used together or their effect on skill levels compared. Lee et al. have reported increased skill levels in the experimental group in their study on web-assisted urinary catheterization skill training in 71 nursing students[14]. Other studies in the literature also report that web-assisted learning makes a positive contribution on the skill levels of students and patients when compared with traditional education[48,49,50,51].

The peer learning study by Palsson et al. on 88 nursing students has revealed a statistically significant increase in the skills of the peer learninggroup[16]. Another study on medical students has reported an increase in skills in those receiving peer learning at the physiology laboratory[52]. Yang et al. have revealed increased skills related to drug administration, coping with diabetes and changes in nutritional problems in pediatric diabetes patients undergoing peerlearning[53]. Other studies on peer learning in the literature have reported that it increases the skill level and self-confidence of the students[19,54,55,56].

Another study in the literature where peer learning and web-assisted learning were used together has

been conducted by Carlson et al. The study reviewed the cultural approach to patients and the professional nursing point of view of student nurses in Sweden and Hong Kong. The students talked about their cultural values and the approach to patients in video interviews. The study revealed that both web-assisted learning and peer learning had a positive effect on professional development[57].

The available studies in the literature indicate that the skill level of the students increase following web-assisted learning and peer learning. The skill scores of the students in our study were quite high but we did not find a statistically significant difference between the effect of the two training methods on skills. We believe both training methods should be used to support traditional training.

It is not possible to generalize the results of this study as it included first year students taking the principles of nursing course at a single university. This study's limitations include the lack of a control group and not evaluating the skill level of the students before the study procedure.

The results of this study revealed initial test and final test knowledge scores of the web-assisted learning and peer learning groups were statistically significantly different. There was a significant increase in the mean knowledge test score after the training in both groups. The increase in knowledge score was similar in the two groups. there was no statistically significant difference between the skill scores of the groups.

The following recommendations are made according to the results of the study; ıncluding interactive learning methods and techniques in the nursing training program, using web-assisted learning and peer learning methods during the basic nursing procedures course for nursing students, conducting studies on larger and control group samples that also include a traditional learning group.

Yazar Katkıları: Çalışma konsepti/Tasarımı: SK, HT; Veri toplama: SK; Veri analizi ve yorumlama: SK, HT; Yazı taslağı: SK, HT; İçeriğin eleştirel incelenmesi: HT; Son onay ve sorumluluk: SK, HT; Teknik ve malzeme desteği: SK; Süpervizyon: SK, HT; Fon sağlama (mevcut ise): yok.
Etik onay: Ankara Yıldırım Bayazıt Üniversitesi (AYBU) etik kurulundan 23.02.2018 tarih ve 35 sayılı kararıyla onay almıştır.
Hakem Değerlendirmesi: Dış bağımsız.
Çıkar Çatışması: Yazarlar çıkar çatışması beyan etmemişlerdir.
Finansal Destek: Yazarlar finansal destek beyan etmemişlerdir.
Author Contributions: Concept/Design : SK, HT; Data acquisition: SK; Data analysis and interpretation: SK, HT; Drafting manuscript: SM, HT; Critical revision of manuscript: HT; Final approval and accountability: SK, HT; Technical or material support: SK; Supervision: SK, HT; Securing funding (if available): n/a.
Ethical approval: Ankara Yildirim Bayazit University (AYBU) received approval from the Ethics Committee on 23.02.2018 with its decision No. 35.
Peer-review: Externally peer-reviewed.
Conflict of Interest: Authors declared no conflict of interest.
Financial Disclosure: Authors declared no financial support

REFERENCES

1. Blazun H, Kokol P, Vosner J. Research literature production on nursing competences from 1981 till 2012: A bibliometric snapshot. Nurse Educ Today. 2015;35:673-9.
2. Collier AD. Characteristics of an effective nursing clinical instructor: the state of the science. J Clin Nurs. 2017;27:363-74.
3. Günay U, Kılınç G. The transfer of theoretical knowledge to clinical practice by nursing students and the difficulties they experience: a qualitative study.Nurse Educ Today. 2018;65:81-6.
4. Jasemi M, Whitehead B, Habibzadeh H, Zabihi RE, Razaie SA. Challenges in the clinical education of the nursing profession in Iran: A qualitative study. Nurse Educ Today. 2018;67:21-6.
5. Bloomfield J, While A, Roberts J. Using Computer assisted learning for clinical skills education in nursing: integrative review. J Adv Nurs. 2008;63:222-35.
6. Hansen M, Oosthuizen G, Windsor J. Enhancement of medical interns' levels of clinical skills competence and self-confidence levels via video ipods: pilot randomized controlled trial. J Med Internet Res. 2011;13:E29.
7. Soran H, Akkoyunlu B, Kavak Y. Yaşam boyu öğrenme becerileri ve eğitimcileri eğitim programı: Hacettepe Üniversitesi. Hacettepe University Journal of Education. 2006;30:201-10.
8. Pront L, Mcneil L. Nursing students' perceptions of a clinical learning assessment activity: "linking the puzzle pieces of theory to practice". Nurse Educ Practice. 2019;36:85-90.
9. Georg C, Zary N. Web-assisted virtual patients in nursing education: development and validation of theory-anchored design and activity models. J Med Internet Res. 2014;16:E105.
10. Lawn S, Zhi X, Morello A. An integrative review of e-learning in the delivery of self-management support training for health professionals. BMC Med Educ. 2017;17:183.
11. Bitsika E, Karlis G, Lacovidou N, Geogiou M, Kontodima P, Vardaki Z et al. Comparative analysis of two venipuncture learning methods on nursing students. Nurse Educ Today. 2014;34:15-8.
12. Lahti M, Hatönen H, Valimaki M. Impact of e-learning on nurses' and student nurses knowledge, skills, and satisfaction: a systematic review and meta-analysis. Int J Nurs Stud. 2014;51:136-49.
13. Öztürk D, Dinç L. Effect of web-assisted education on nursing students' urinary catheterization

knowledge and skills. Nurse Educ Today. 2014;34:802–8.
14. Lee NJ, Chae SM, Kim H, Lee JH, Min JH, Park DE. Mobile-based video learning outcomes in clinical nursing skill education. Comput Inform Nurs. 2016;34:8-16.
15. Yoo MS, Son YJ, Kim YS, Park JH. Video-based self-assessment: implementation and evaluation in an undergraduate nursing course. Nurse Educ Today. 2009;29:585-9.
16. Palssony, Martensson G, Swenne LC, Adel E, Engstrom M. A peer learning intervention for nursing students in clinical practice education: a quasi-experimental study. Nurse Educ Today. 2017;51:81-7.
17. Brannagan KB, Dellinger A, Thomas J, Mitchell D, Trabeaux S, Dupre S. Impact of peer teaching on nursing students: perceptions of learning environment, self-efficacy and knowledge. Nurse Educ Today. 2013;33:1440-47.
18. Santee J, Garavalia L. Peer tutoring programs in health professions schools.Am J Pharm Educ. 2006;70:1-10.
19. Ramm D, Thomson A, Jackson A. Learning clinical skills in the simulation suite: the lived experiences of student nurses involved in peer teaching and peer assessment. Nurse Educ Today. 2015;35:823-7.
20. Abaan S, Duygulu S, Uğur E. Akran danışmanlığı: yeni hemşirelik öğrencilerini güçlendirmede iç denetim odağını geliştirme yolu. Sağlık Bilimleri Fakültesi Hemşirelik Dergisi. 2012;19:24-35.
21. Çırpan FK, Çınar S. Sağlık Hizmetleri Meslek Yüksek Okulu öğrencilerinde akran desteği ile akademik başarı arasındaki ilişkinin değerlendirilmesi. Marmara Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi. 2013;3:191-9.
22. El-Sayed SH, Metwally FG, Abdeen MA. Effect of peer teaching on the performance of undergraduate nursing students enrolled in nursing administration course. J Nurs Educ Pract. 2013;3:156-66.
23. Huston CL, Philips B, Todero C, Rich J, Knecht P, Sommer S et al. The academic-practice gap: strategies for a enduring problem. Nurs Forum. 2018;53:27-37.
24. Resmi Gazete. Hemşirelik Yönetmeliğinde Değişiklik Yapılmasına Dair Yönetmelik 2011. Ankara, TC Başbakanlık, 19.4.2011.
25. Yeşiltaş A, Gül İ. Hemşirelerin çalışmak için tercih ettikleri birimler ve tercih nedenleri. Mehmet Akif Ersoy Üniversitesi Sağlık Bilimleri Enstitüsü Dergisi. 2016;4:74-87.
26. Faury S, Koleck M, Foucaud J, Bailara KM. Quintard B. Patient education interventions for colorectal cancer patients with stoma: a systematic review. Patient Educ Couns. 2017;100;1807-19.
27. Uzşen H, Binay Ş, Gümüş M, Başbakkal Z. Nursing approach in children with stoma. J Nurs Sci. 2018;1:39-45.
28. Yang LQ, Wei Q, Huang Y, Jiang YX, Chen DZ, Huang P et al.. The application of multimedia messaging services via mobile phones to support outpatients: home nursing guidance for pediatric intestinal colostomy complications. Chinese Nursing Research. 2015;2:9-11.
29. Duruk N, Uçar H. Staff nurses' knowledge and perceived responsibilities for delivering care to patients with intestinal ostomies. J Wound Ostomy Continence Nurs. 2013;40:618-22.
30. Lima JA, Muniz KC, Salome GM, Ferreira LM. Association of sociodemographic and clinical factors with self-image, self-esteem and locus of health control in people with an intestinal stoma. Journal of Coloproctology. 2018;38:56-64.
31. Mota MS, Gomes GC, Petuco VM, Heck RM, Barros EJL, Gomes VLO. Facilitators of the transition process for the self-care of the person with stoma: subsidies for nursing. Rev Esc Enferm USP. 2015;49:80-6.
32. Zimnicki K, Pieper B. Assessment of prelicensure undergraduate baccalaureate nursing students: ostomy knowledge, skill experiences, and confidence in care. Ostomy Wound Manage. 2018;64:35-42.
33. Bales I. Testing a computer-based ostomy care training resource for staff nurses. Ostomy Wound Manage. 2010;56:60-9.
34. Braga CSR, Andrade EMLR, Luz MHBA, Monteiro AKC, Campos MOOB, Silva FMS et al. Construction and validation of a virtual learning object on intestinal elimination stoma. Invest Educ Enferm. 2016;34:120-27.
35. Aşti AT, Karadağ A. Hemşirelik Esasları Hemşirelik Bilimi ve Sanatı. İstanbul, Akademi Basın, 2012;.
36. Craven RF, Hirnle KJ, Constance J. PrepU for Craven's Fundamentals of Nursing: Human Health and Function, 7th edition. Philadelphia ;PA, Lippincott Williams&Wilkins, 2012.
37. Berman A, Snyder SJ, Kozier B, Erb G. Kozier&Erb's Fundamentals of Nursing Concepts, Process, And Practice,8th Ed., Upper Saddle River, NJ, Pearson Education, 2008.
38. Lynn P, Lebon M. Taylor's Clinical Nursing Skills A Nursing Process Approach, 3rd Edition. Philadelphia, PA, Lippincott Williams & Wilkins, 2011.
39. Tüzer H. Abdominal stomalı hastaların stoma bakımına ilişkin bilgi düzeylerinin belirlenmesi (Yüksek lisans tezi). Ankara, Gazi Üniversitesi, 2007.
40. Ahmad MM, Musallam R, Allah AH. Nurses and internet health-related information: review on access and utility. Clujul Medikal. 2018;91:266-73.
41. Chuang YH, Lai FC, Chang CC, Wan HT. Effects of a skill demonstration video delivered by smartphone on facilitating nursing students' skill competencies and self-confidence: a randomized controlled trial study. Nurse Educ Today. 2018;66:63-8.
42. Sowan AK, Idhail JA. Evaluation of an interactive web-assisted nursing course with streaming videos for medication administration skills. Int J Med Inform. 2014;83:592-600.

43. Versteeg M, Blankenstein FM, Atıcı H, Steendijk P. Peer instruction improves comprehension and transfer of physiological concepts: a randomized comparison with self-explanation. Adv Health Sci Educ. 2019;24:151-65.
44. Abdullah KL, Chan CM. A systematic review of qualitative studies exploring peer learning experiences of undergraduate nursing students. Nurse Educ Today. 2018;71.185-92.
45. Sadowski CA, Li JC, Pasay D, Jones CA. Interprofessional peer teaching of pharmacy and physical therapy students. Am J Pharm Educ. 2015;79:155.
46. Yurt S, Sağlam RA, Kadıoğlu H. Akran eğitiminin meme kanseri taraması ile ilgili sağlık inançlarına etkisi. Uluslararası Hemşirelik Dergisi. 2019;3:1-19.
47. Tahari M, Amini M, Delavari S, Bazrafkan L, Moradi J. Effect of peer assisted learning (pal) education on knowledge, attitude and behavior related to prevention and control of diabetes. BMC Res Notes. 2019;12:227.
48. Hollanda A, Smith F, McCrossan G, Adamson E, Watt S, Penny K. Online video in clinical skills education of oral medication administration for undergraduate student nurses: a mixed methods, prospective cohort study. Nurse Educ Today. 2013;33:663-70.
49. Kim SJ, Shin H, Lee J, Kang S, Bartlett R. A smartphone application to educate undergraduate nursing students about providing care for infant airway obstruction. Nurse Educ Today. 2017;48:145-52.
50. Gonzalez R, Barry-Brien P, Ancheta R, Razal R, Clyne MR. Peer education versus computer-based education. J Nurses Prof Dev. 2017;33:1-5.
51. Davis SA, Carpenter DM, Blalock SJ, Budenz DL, Lee CI, Muir KW et al. Glaucoma patient preferences for video education on eye drop technique. Optom Vis Sci. 2019;96:325-30.
52. Bian H, Bian Y, Li J, Li Y, Ma Y, Shao X et al. Peer instruction in a physiology laboratory course in China. Adv Physiol Educ. 2018;42:449-53.
53. Yang Py, Lou MF, Lien AS, Gau BS. Adolescent perceptions of peer responses to diabetes self-management: a qualitative study. J Nurs Res. 2018;26:104-11.
54. Sabaq AG, Farouk M, İsmail S. Effect of peer teaching versus traditional teaching method on nursing students performance regarding pediatric cardio pulmonary resuscitation. J Nurs Health Sci. 2016;5:18-25.
55. Mills DA, Hammer CL, Murad A. Power of peers: students' perceptions of pairing in clinical dental education. J Dent Educ. 2017;81:36-3.
56. Sheahan G, Reznick R, Klinger D, Flynn L, Zevin B. Comparison of faculty versus structured peer-feedback for acquisitions of basic and intermediate-level surgical skills. Am J Surg. 2017;2:214-21. ,
57. Carlson E, Stenberg M, Chan B, Ho S, Lai T, Wong A et al. Nursing as universal and recognisable: nursing students' perceptions of learning outcomes from intercultural peer learning webinars: a qualitative study. Nurse Educ Today. 2017;57:54-9.