RESEARCH ARTICLE

Colostomy and ileostomy care in nursing education: Which is more effective: Synchronous or asynchronous?

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Abstract

Objective: To compare the effects of synchronous and asynchronous training on the academic achievements and e-learning attitudes of nursing student trained in colostomy and ileostomy care.

Method: The quasi-experimental, descriptive study was conducted at the Nursing Department of a health facility after approval from the Tekirdag Namik Kemal University, Tekirdag, Turkey, from May to June 2020, and comprised nursing students who were divided in intervention group A and control group B. Those in group A were given synchronous training on colostomy and ileostomy care using active learning techniques on an online platform, while those group B received their training only asynchronously. Data was collected using Colostomy and Ileostomy Knowledge Test, and the e-Learning Attitude Scale at baseline and post-intervention. Data was analysed using SPSS 17.

Results: Of the 154 students, there were 77(50%) in each of the two groups. Overall, 53(34.4%) students were in 2nd grade, 60(39%) in 3rd, and 41(26.6%) in 4th grade of their training. The mean age of the sample was 21.50±1.10 years. Post-intervention mean scores for knowledge and e-learning tendency were significantly higher in both the groups compared to the baseline ($p<0.01$). Mean score for e-learning avoidance was significantly lower and mean knowledge score was significantly higher in group A than group B ($p<0.05$).

Conclusion: The application of active learning activities among students was found to have a positive effect on nursing education compared to asynchronous teaching.

Keywords: Nursing student, Distance learning, Academic success, E-learning. (JPMA 72: 1553; 2022)

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Introduction

The coronavirus disease-2019 (COVID-19) pandemic, which affected the world, has caused many changes in education. Nursing education has been rapidly changing to become more digital and accessible to meet the demands and educational needs of the students. The changing nature of communication and interaction has affected all other aspects of teaching,[1,2] especially e-learning through information technology (IT) has been used frequently in distance learning. Students have started to receive their education synchronously or asynchronously, which has increased the need for more interactive learning systems.[1] While in synchronous training, two-way communication and mutual interaction happen simultaneously, in asynchronous training, the course content is prepared in advance and delivered to learners via the internet.[3] In nursing education during the pandemic, cognitive, psychomotor, and affective domains are provided to the learner through synchronous or asynchronous training to make the nursing students' learning meaningful by promoting critical thinking and interpretation skills.[4] While students try to gain more from online learning, educators likewise evaluate how they can teach more efficiently.[5,6] Especially in the context of COVID-19, educators' adaptation to changing technology, learning theories and changing educational needs may have an impact on students' academic achievement and e-learning attitudes in distance learning.[4] Distance education practices in Turkey, especially in nursing, have a short history and limited experience.[7] The current study was planned to compare the academic achievements and e-learning attitudes of nursing students who received synchronous or asynchronous training in colostomy and ileostomy care.

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Subjects and Methods

The quasi-experimental, descriptive study was conducted from May to June 2020 at the Nursing Department of a health facility after approval from the ethics review committee of Tekirdag Namik Kemal University, Tekirdag, Turkey. The sample size was calculated using G-Power[8] for Windows v3.1.9, with interactions between the repeated-measures factors and between-group factors set according to a previous study[9] with power 0.8, α 0.05 and effect size 0.46. Considering a loss rate of 10%, the sample size was inflated by that much. A pilot study was conducted with 15 students to check the

comprehensibility of the questionnaires and scales. These students were not included in the main study.

After written permission from school the students were enrolled after taking informed consent from each of them. All students were clearly informed that their refusal to participate will not affect them in any way. Based on their weighted grade point average (GPA), students who took the surgical nursing course and volunteered to participate in the study were included divided into non-random intervention group A and control group B (Figure-1). The participants were restrained from discussing the content of teaching material during the research progress to avoid any inaccuracies in the results. Basic data was collected using a Student Data Form that had eight questions about the socio-demographic characteristics, including, age, grade, and internet access information. The Colostomy and Ileostomy Care Knowledge Test[10] and e-Learning Attitude Scale[11] were used to measure the study outcome.

Colostomy and Ileostomy Care Knowledge Test consisted of 30 questions about stoma care. The questions were reviewed by experts on this topic and validity and reliability were assessed. For each item, response options were "True", "False" or "No idea". E-learning Attitude Scale's Turkish version[11] consists of 20 items that are scored on a 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree"[5]. The Cronbach α coefficient of the scale was calculated as 0.93 for 10 positive items and 0.84 for 10 negative items. The alpha value for the 20 items of the scale was 0.93. The Kaiser-Meyer-Olkin (KMO) value was 0.95 and the Bartlett test was significant (p=0.00).

A study[12] determined the preferences of students with

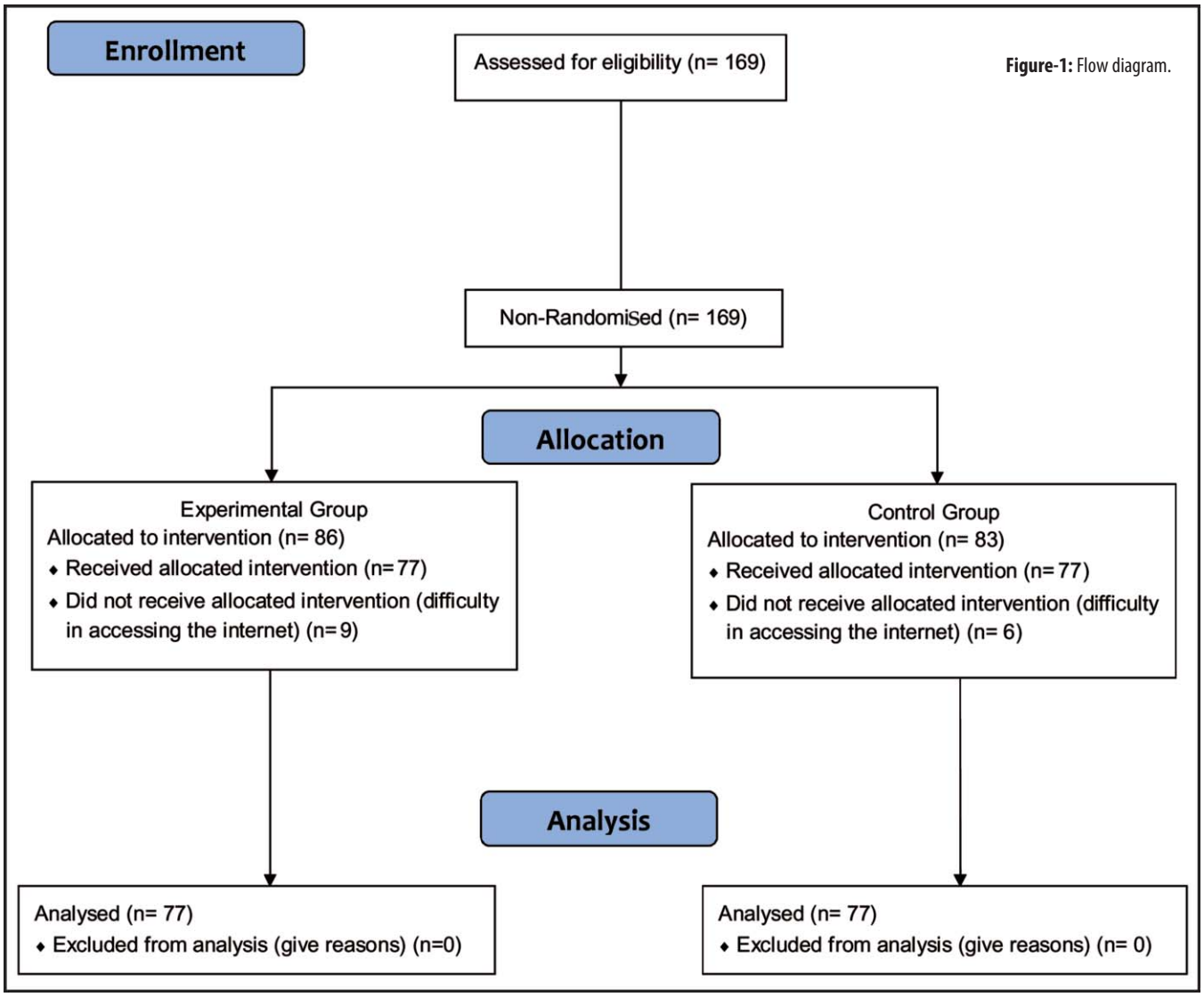

Figure-1: Flow diagram.

various learning styles regarding online learning subjects and found that students mostly preferred video lectures. As such, a 90-minute video, including theoretical presentation and nursing skills presentation about colostomy and ileostomy care, was prepared by the trainer. Educational objectives related to the subject were defined and the content was designed in the light of national and international literature.[13,14] Video images were used as materials to provide information.[15] The video was shot in a lab environment. The video flow plan included the introduction of the materials to be used in the relevant skill and the implementation of all steps by the instructor in line with the skill checklist.[15] In the videos, the trainer showed all the implementation steps and explained them aloud.

The Colostomy and Ileostomy Care Knowledge Test and the E-Learning Attitude Scale were applied to each of the two group before the training. Those in group A were given synchronous training on colostomy and ileostomy care using active learning techniques, while those in group B received their training only asynchronously and only videos were shared with group B students. The presentation was presented online by the same educator through an online programme. Nursing skills were both explained verbally and shown in the video. With the participation of students on the online platform in group A, active learning activities, such as question-answer and discussion, were applied, and the training ended.

After the training, the Colostomy and Ileostomy Care Knowledge Test and the E-Learning Attitude Scale were applied again.

Data was analysed using SPSS 17. Kolmogorov-Smirnov and the Shapiro-Wilk tests were used to test the normal distribution of data. Nonparametric Mann-Whitney U test was used when the variables were not normally distributed. Nonparametric Wilcoxon Test was used when examining the difference between paired data that was not normally distributed. P<0.05 was considered statistically significant.

Results

Of the 154 students, there were 77(50%) in each of the two groups. Overall, 53(34.4%) students were in 2nd grade, 60(39%) in 3rd, and 41(26.6%) in 4th grade of their training. The mean age of the sample was 21.50±1.10 years.

Post-intervention mean scores for knowledge and e-learning tendency were significantly higher in both the groups compared to the baseline (p<0.01) (Table-1).

Mean score for e-learning avoidance was significantly lower in group A compared to group B (Table-2).

The mean knowledge score was significantly higher in group A than group B (Table-3).

Table-1: Comparison of pre-training and post-training colostomy and ileostomy care knowledge test results.

	N	Mean	SD	Min	Max	Z	p values
The control group							
Pre-training	77	17.18	4.85	0	26	-7.233**	0.001*
Post-training	77	24.36	4.75	0	30		
The experiment group							
Pre-training	77	16.56	5,51	2	27	-7.667**	0.001*
Post-training	77	25.7	3,72	11	30		

SD: Standard deviation, Min: Minimum, Max: Maximum.
*p<0.05; **Wilcoxon signed rank test.

Table-2: Comparison of pre-training and post-training scores of the subscales of e-Learning Attitude Scale.

		N	Mean	SD	Min	Max	Z	P
The control group								
E-Learning Tendency	Pre-training	77	31.52	8.19	10	50	-3.629**	0.001*
	Post-training	77	33.64	8.66	10	50		
E-Learning Avoidance	Pre-training	77	27.84	8	10	47	-1.069**	0.285
	Post-training	77	27.31	7.93	10	50		
The experiment group								
E-learning Tendency	Pre-training	77	30.36	7.72	14	47	-5.592**	0.001*
	Post-training	77	36.56	9.31	15	50		
E-learning Avoidance	Pre-training	77	29.55	7.56	15	46	-4.049**	0.001*
	Post-training	77	26.09	6.74	12	43		

SD: Standard deviation, Min: Minimum, Max: Maximum.
*p<0.05; **Wilcoxon signed rank test.

Table-3: Comparison of pre-training and post-training colostomy and ileostomy care knowledge scores between interventional and control groups.

		n	Mean	SD	Min	Max	Z	p values
Pre-training	The control group	77	17.18	4.85	0	26	-0.92	0.358
	The experiment group	77	16.56	5.51	2	27		
Post-training	The control group	77	24.36	4.75	0	30	-2.051**	0.040*
	The experiment group	77	25.77	3.72	11	30		

SD: Standard deviation, Min: Minimum, Max: Maximum.
Results are presented as mean ± standard deviation (median).
p values* for comparison of groups.
*p<0.05; **Mann-Whitney U Test.

Discussion

Clinical practices are considered an important component of education, as they provide students with the opportunity

to develop and refine clinical knowledge and skills they have learned in the classroom. Clinical trainings started to be given through distance education during the pandemic period. Although the pandemic is accelerating this process, the adoption of online learning has been inevitable. The benefits of online learning provide opportunities to educate a growing number of nursing students across both temporal and geographic boundaries.[16] The current results demonstrated that both synchronous and asynchronous colostomy and ileostomy care training increased academic success and e-learning tendency of both the intervention and control groups. However, synchronous training was more effective. Ogbonna et al.[17] compared asynchronous and synchronous training and found that both types of training significantly increased students' success and skill acquisition. Students who received asynchronous training reported higher cognitive achievement, while students who received synchronous training showed improved skill acquisition.[17]

After the training, the mean scores for e-learning tendency increased in both the groups in the current study. A potential strategy to keep education uninterrupted during COVID-19 is to bring together technologies that facilitate simultaneous distance learning. Combining web-based modules, simulation environments and discussion boards can be used to improve the work and communication skills of the students.[18] Largely, webinars offer digital learning environments that students can access from anywhere with their computer devices. A study observed that the integration of synchronous webinars into the distance education curriculum and blended learning programme was effective.[19] Technology skills of students who receive education as synchronous or asynchronous also improve,[20] which is consistent with the current findings. Also, e-learning avoidance score of the students in the experiment group decreased after the training. This finding suggests that the students in the experiment group were more eager towards e-learning after the training and their avoidance of e-learning decreased.

The post-training knowledge level of the experiment group was higher than that of the control group. In online education, while stakeholders reviewed how to best use online learning, educators also had the opportunity to consider how it could be taught better. The fast-paced field in which it is evolving, especially in the context of COVID-19, requires educators to keep up with changing technology, learning theories, and the changing educational needs of students.[19] Some educators prefer synchronous training also because it gives learners the opportunity to engage in dialogue, discuss the topic together, and let the learner think critically.[21]

Martin et al.[22] emphasised that instant feedback and learner-learner, learner-educator interactions are important for success in online learning. They also reported that the use of interesting content and visuals were effective in attracting learners' attention.[22] Karal et al.[23] investigated the perceptions of students taking synchronous courses with distance education. Some students stated that they were better motivated to the lectures with distance education. They watched the lectures without stress and stated that the lectures could be given easily with discussion and question-answer.[23] Malik et al.[24] compared asynchronous and synchronous education and concluded that students were more interested in synchronous education. The reason why the knowledge level of students receiving synchronous education is higher than those who receive asynchronous education may be the effectiveness of active learning methods, such as learner-educator interaction, question-answer, and discussion during education.

In terms of limitations, the current study was done at a single centre and comprised only nursing students. As such, the findings are not generalisable.

Conclusion

After colostomy and ileostomy care training, the level of knowledge and tendency towards e-learning of the students in the intervention and control groups increased. Also, academic success was higher in the intervention group receiving synchronous education, and e-learning avoidance was low.

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Conflict of Interest: None.

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