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Research Article

COMPARISON OF FACE-TO-FACE AND DISTANCE EDUCATION METHODS IN ACQUIRING LEARNING SKILLS: EVALUATION IN THE PERIOD OF PANDEMIC†

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Abstract: *It was aimed to investigate the effectiveness of two different techniques, distance, and face-to-face education, in the acquisition of learning skills related to the course of an applied undergraduate program course in the ongoing pandemic conditions. This one-group, semi-experimental study was completed with 68 students. "Participant Information Form", "Instruction Form for Preparing Practice Videos" and "Guide to Practice Learning Skills" were used in data collection. The study was carried out in three stages. In the first stage, the course was taught through distance education with theoretical information and educational videos. In the second stage, students were asked to apply first aid, record it on video and send the file via the e-lesson system. In the third stage, the applications were explained face to face by the lecturer in the laboratory environment, and the students were instructed to do these applications. Data were analyzed using the SPSS program. The mean age of the participants was 20.64±0.91 years, while 69.1% (n=47) were female, and 31.9% (n=21) were male. Among the participants, 26.5% (n=18) had previously received training about first aid, whereas 55.5% (n=10) of those who had stated that they received this training in high school. It was determined that the grades that the participants received after the face-to-face applied education process were significantly higher than the grades they received after the distance education process (p<0.001). In the applied courses, it will be useful to use blended education models as much as possible under pandemic conditions.*

Keywords: *Blended learning, distance education, learning skill, nursing students, pandemic*

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1. Introduction

The COVID-19 pandemic, which started in 2019 in China and rapidly spread to the entire world, had continued to be effective so far. One of the fields that have been affected by this issue involves education-instruction activities. As greater numbers of students at schools within an academic year would make it easier for the virus to spread, as in other counties in the world, education institutions in Turkey have also transitioned to distance education since the first months of 2020. [1,2]

Distance education is an instruction method that is based on carrying out classes where educators and students are present in different places and at different times and using information technologies actively to facilitate learning. [3] Distance education has had examples in different periods and different forms around the globe. It is known that education activities took place in the form of sending letters back and forth in the 1700s, through visual-auditory devices (radio and television) in the 1920s, via

† This study has been included as an oral presentation in the 'International Congress on Open Learning and Distance Education 2021 (ICOLDE 2021)' that was organized between 9 and 10 October 2021 and was awarded second place.

teleconferencing in 1980, and through internet- and web-based tools after 1990. While an instruction-focused understanding used to be dominant in distance education, since the 1990s, a learning-focused approach has become prominent. In Turkey, distance education processes have continued in the form of sending letters between 1950 and 1970, with visual-auditory tools between 1976-1995 and through the internet- and web-based tools since 1996. As in the rest of the world, a learning-focused distance education approach has been adopted in Turkey after 1996. [4] Distance education methods in nursing education in Turkey were used for the first time in the training of nurses with high school degrees in associate degree programs between 1991 and 1999. [5] On the other hand, by 2005, it was decided by the European Parliament and Council (2005) that at least half of the education process in nursing should be allocated to the application. [6] In parallel with this, the Council of Higher Education in Turkey also decided in 2008 that the theoretical and clinical parts of nursing education cannot be thought of separately with numerical data (at least 4 years of education, 4600 hours of theoretical and clinical education, at least half consisting of clinical education) and published this decision in the Official Gazette (2008). [7] After this date, nursing education started to be provided through the face-to-face method. However, in nurse training, distance education in the pandemic process has become prevalent in Turkey like in other countries in terms of access to and the sharing of information. [8] Nevertheless, the interruption of formal education brought about problems such as the fact that most students are not used to the method of distance education, infrastructure problems, and adaptation problems. In addition to concerns about physical health associated with the COVID-19 pandemic, the sudden change in education processes affected students mentally and socially in a negative sense. [9,11] Although it is being attempted to develop current strategies that would increase the quality of education, as it takes time to put these into practice, problems continue to be experienced. Thus, distance education has become a factor that is effective in the success status of students. [12] A previous study reported that not every student may succeed in online classes in the distance education process, and the failure rates in distance education classes were 10-20 times higher in comparison to face-to-face classes. [13] A study that was carried out with nursing students revealed that the students passed their classes with average grades, and thus, they were not satisfied with distance education. [14]

Nursing students can gain professional qualifications in the case that they actively participate alongside educators at the clinic and the laboratory. [15] For this reason, nursing education consists mostly of applied classes. [16] The First Aid and Emergency Care Nursing Course that is included in the nursing curriculum is also mostly carried out in the laboratory environment. The purpose of this course is to provide students with the skills of implementing first aid practices that are carried out at the scene or in emergency services in life-threatening cases. While these interventions eliminate the risk of the person's death when they are correctly, effectively, and quickly implemented, they are also highly important in the prevention of morbidities and secondary injuries and in speeding up the recovery process. [17-20] Therefore, conducting first aid-related practices in an environment that allows active participation is highly important for providing students with learning skills.

Because holding an applied class face-to-face during the pandemic period would threaten health, most such classes have been held through distance education. [21] Nonetheless, as the pandemic period is going on in the entire world, and the number of cases per day in Turkey is still high, [22] there are still uncertainties about face-to-face education in the academic years to follow. Even though a transition is made back to face-to-face education, the possibility that not all students will be allowed to be present in laboratories together will affect the time they will spend in laboratories. As a reduction in this time will also influence their effective learning at the times they will be involved, it is crucial to make a good plan accordingly.

The fact that studies have been carried out on education processes since the onset of the pandemic will undeniably be helpful in relevant preparations. Nevertheless, some studies have investigated the

opinions of students and educators about distance education in this period. [23-27] No study that examined the effects of mixed/blended education involving both face-to-face and online education on nursing students' academic success statuses in the Covid-19 pandemic period was encountered. Therefore, this study, it was aimed to analyze the effectiveness of two different techniques as distance education and face-to-face education in providing students taking the First Aid and Emergency Care Course, which is an applied course, with learning skills. It was aimed for this study to support educational institutions, educators, and students in their preparations regarding education and instruction.

2. Materials and Method

2.1. Design

This is a single-group quasi-experimental study. This study was performed according to the TREND reporting guidelines for non-randomized/quasi-experimental studies (Supplementary File-1).

2.2. Population and sample

This study was conducted with students who were taking the First Aid and Emergency Care Nursing course at a state university. Therefore, all students registered for the course constituted the population of the study (N=71). Based on the literature, with α=0.05, an effect size of 0.5, in a 95% confidence interval, and with a 95% power, the minimum required sample size was calculated as 54 participants. [28] The study was completed with a total of 68 students (95.7%) who participated in the distance education and face-to-face education sessions, were taking the course for the first time, did not have any obstacles to performing the practices, and voluntarily agreed to participate in the study.

2.3. Data collection instruments

The data were collected using a Participant Information Form, an Instruction Form for Preparing Application Videos, and a Guideline for Applying Learning Skills.

Participant Information Form: This form that was prepared to collect the data of the participants included six questions on their age, whether they previously received education about first aid, the time and place of this education if they did, whether or not they were working at a job, and their duties at the job if they were.

Instruction Form for Preparing Application Videos: The form included instructions for the participants for their preparation of the application video they would send to the instructor after the completion of the theoretical classes. The instructions clearly described what was expected of them and the scoring system to be used. The practices that were expected of the participants were determined as the application of basic life support, the coma position, applying the Heimlich maneuver, first aid practices in traumas (head-spine, chest, and abdominal injuries), first aid practices in bleeding cases, the shock position, patient transport techniques and identification of fractures. The success levels of the participants were determined over 30 points based on the scores they would obtain from two scoring stages.

The *first stage* of scoring, it was aimed to measure the critical thinking and decision-making skills of the participants. A total of 15 points was assigned to this stage which was concerned with the assessment of the scene of the incident/the injured, being able to explain the purpose of the practices that are performed, and determining priorities. As known, it is vitally important for the first aider to determine the priority patients and practices in case of an incident. Especially the 4-minute period that starts with the halting of the respiratory and cardiovascular functions of the injured/patient is known as

the 'golden time', irreversible injuries start in brain cells by the 10th minute. [17-20] This is why it was also significant that this study assessed these steps.

The *second stage* was also assigned 15 points, and it consisted of the steps of applying first aid practices in the correct order and determining the appropriate method of transporting the patient/injured. The success scores of the participants during the face-to-face implementations were also given the same way. In both methods, the time of application was limited to a minimum of 5 minutes and a maximum of 15 minutes.

Guideline for Applying Learning Skills: This form was prepared based on the up-to-date literature for making it easier for the participants to see first aid practices step by step. [17-20,29] In the form, the steps of first aid were written down one by one, and the participants were expected to perform these steps in the correct order. The participants' implementation of these steps was assessed by a score of 3 for 'failed to perform', 2 for 'performed (needs improvement)', and 1 for 'performed'. With this assessment method, it was aimed to help the participant determine their own self-efficacy. The application success score of the participant was calculated as specified in the Instruction Form for Preparing Application Videos.

2.4. Implementation

The study was completed in three stages. At the first stage, at the beginning of the semester, the participants were given the Instruction Form for Preparing Application Videos and the Guideline for Applying Learning Skills. The Guideline was given early in the process for preparing the participants for the first aid practices and allowing them to reinforce the theoretical topics of the classes with practices. Additionally, in the Instruction Form, the scoring scheme of the first aid practices was explained clearly, and it was stated that the scores the participants would obtain would show their applied success grade for the course. The total applied success grade of the course was determined to be on a scale of 0 to 60 points. In this grade, 30 points were allocated to the video assignment the participants would send in the second stage of the study, whereas the remaining 30 points were allocated to the implementation they would make in the laboratory in the third stage. The data of the study were collected between 21.05.2021 and 18.06.2021, starting with the reception of the first video assignment, and the study was completed in three stages.

2.4.1 First stage

In the *first stage*, the theoretical and practice parts of the First Aid and Emergency Care Nursing course were taught through distance education with online classes theoretically and with appropriate educational videos. The application video for each practice was shown at the end of the theoretical class, and it was aimed to reinforce the information to provide learning skills. The first aid practice to be taught by each instructor was determined before the classes started. In the distance education and face-to-face implementations, the same instructor taught and showed the first aid practices and instructed the participants to apply them.

2.4.2 Second stage

In the *second stage*, the participants were instructed to perform a first aid practice in line with the Guideline for Applying Learning Skills with the steps specified in the Instruction Form for Preparing Application Videos and record it on video. The participants uploaded the videos they recorded via the institutional distance education system of the university. The completed video assignments were evaluated by the instructor who taught the respective practice during the distance education process.

2.4.3 Third stage

In the *third stage*, the first aid practices were taught by the instructors of the course in the laboratory environment in an applied, face-to-face manner. At this stage, the participants were asked to perform the practices after the instructors did.

Before the participants arrived for face-to-face education in the laboratory environment, the laboratory schedule was planned in line with pandemic-related precautions. There were two laboratories in total. According to the pandemic period rules, a maximum capacity of 10 people was allocated for either laboratory. The participants were divided into 8 groups, and the numbers of participants in the groups were allocated as 8, 8, 8, 8, 9, 9, 9, and 9. The laboratory to be used by each group, the date and hour of the application, and information on the instructors were determined beforehand. Due to the requirements of the pandemic rules, the students took part in their applied classes in the same laboratory which was assigned to them for their practice implementations. Moreover, the time allocated for the practices during the theoretical instruction of the class was the same as the time allocated for the same practices in the laboratory. Table 1 shows the applied education sessions, instructors, and durations in the face-to-face education part of the study. The participants received training on all first aid practices and performed these practices simultaneously in the laboratory. Within the scope of the study, among the practices performed by the participants in the laboratory environment, only the practices performed in the video assignment were considered for analysis.

Table 1. Education sessions, instructors, and application times

Sessions	Instructor	Application Time
Basic life support Coma position Heimlich maneuver	Instructor 1	4 hours
First aid practices in traumas (head-spine, chest and abdominal injuries)	Instructor 2	4 hours
First aid practices in bleeding cases, Shock position		2 hours
Patient transport techniques		1 hour
Identification of fractures	Instructor 1	3 hours

2.5. Statistical analysis

The data were analyzed using the SPSS 16.0 program. Shapiro-Wilk test was used to test the normality of the distribution of the data. Descriptive statistical analysis included frequencies, percentages, means, standard deviations, minimum values, and maximum values. The application scores of the participants obtained in the course during the distance education and face-to-face education processes were analyzed using a paired-sample t-test. The sociodemographic characteristics of the participants were compared to their distance education and face-to-face education application scores by using an independent-sample t-test, one-way analysis of variance (ANOVA), and Pearson's correlation analysis. The results were interpreted within a 95% confidence interval, and $p<0.05$ was accepted as statistically significant.

Ethical considerations

For this study, approval from the Social Sciences and Humanities Ethics Committee of Bartın University (dated 31/05/2021, numbered 2021/09) and written permission from the institution where the study would be conducted were obtained. The participants were informed about the objective of the study and other necessary details, and their consent was received.

3. Results

The descriptive statistics of the sociodemographic characteristics of the participants and their application scores are presented in Table 2. The mean age of the participants was 20.64±0.91 years, 69.1% were female, and 31.9% were male. While 26.5% of the participants stated that they had previously received education on first aid, 55.5% of those who had received such education said they had this education during their high school education. Among these participants, one-half stated that they received first aid education before 2018, whereas the other half said they received first aid education after 2018. It was found that 10.3% of the participants were working, and among those who were working, only 14.2% took part in a health-related area at their workplace (Table 2).

Table 2. Sociodemographic characteristics of the participants

Sociodemographic characteristics	n	%	
Gender			
Female	47	69.1	
Male	21	31.9	
Has received first aid education			
Yes	18	26.5	
No	50	73.5	
Source of first aid education			
Driving school	7	38.8	
High school education	10	55.5	
Certificate Program	1	5.7	
Time of receiving first aid education (between 2015 and 2019)			
Before 2018	9	50.0	
In or after 2018	9	50.0	
Working			
Yes	7	10.3	
No	61	89.7	
Duty at the workplace			
Health-related	1	14.2	
Not health-related	6	85.8	
	X±SD	**Age Range**	**Median**
Age	20.64±0.91	19-22	23

The difference between the scores of the participants in the assessment of their applied assignments given during distance education and their scores in the assessment of their practices in their face-to-face applications was statistically highly significant ($p<0.001$). After the face-to-face application, the first-stage, second-stage, and third-stage scores of the participants increased (Table 3).

Table 3. Comparison of the application scores of the participants after distance and face-to-face education

Application score	X±SD	Min.-Max.	Median	t	p[a]
Total scores					
After distance education	20.35±2.80	15-29	20	-17.25	**< 0,001**
After face-to-face education	26.70±1.78	22-30	27		
1st stage scores					
After distance education	11.22±1.36	8-15	10	-12.36	**< 0,001**
After face-to-face education	13.54±1.08	11-15	13		
2nd stage scores					
After distance education	9.11±2.06	5-15	9	-15.33	**< 0,001**
After face-to-face education	13.11±1.28	10-15	14		

[a] *Paired-samples t-test*

There was no statistically significant relationship between the application scores of the participants after distance education and their sociodemographic characteristics (Table 4).

Table 4. Comparison of the sociodemographic characteristics of the students and their application scores after distance education

Sociodemographic characteristics	Application score (X±SD)	Statistical test	p
Gender			
Female	20.74±2.70	1.749	0.085[a]
Male	19.47±2.89		
Has received first aid education			
Yes	20.83±3.03	0.845	0.401[a]
No	20.18±2.73		
Source of first aid education			
Driving school	20.42±4.39	0.577	0.573[b]
High school education	20.80±1.81		
Certificate Program	24.00		
Working			
Yes	20.14±3.53	-0.208	0.836[a]
No	20.37±2.74		
Duty at the workplace			
Health-related	22.00	0.533	0.617[a]
Not health-related	19.83±3.76		
Age		-0.003	0.980[c]

[a] *Independent-samples t-test,* [b] *One-way ANOVA,* [c] *Pearson's correlation analysis*

There was no statistically significant relationship between the application scores of the participants after face-to-face education and their sociodemographic characteristics (Table 5).

Table 5. Comparison of the sociodemographic characteristics of the students and their application scores after face-to-face education

Sociodemographic characteristics	Application score (X±SD)	Statistical test	p
Gender			
Female	26.59±1.83	-0.784	0.436[a]
Male	26.95±1.46		
Has received first aid education			
Yes	27.22±1.55	1.492	0.141[a]
No	26.52±1.76		
Source of first aid education			
Driving school	27.57±1.98	0.485	0.625[b]
High school education	26.90±1.28		
Certificate program	28.0		
Working			
Yes	25.57±1.27	-1.867	0.066[a]
No	26.83±1.73		
Duty at the workplace			
Health-related	27.00	1.274	0.259[a]
Not health-related	25.33±1.21		
Age		-0.048	0.698[c]

[a] *Independent-samples t-test,* [b] *One-way ANOVA,* [c] *Pearson's correlation analysis*

4. Discussion

In this study, there was a statistically significant difference between the application success scores of the students who took the First Aid and Emergency Care Nursing course with two different methods as distance education and face-to-face education. The application success scores of the participants increased after they took an active part in the face-to-face classes in the laboratory ($p<0.001$). Additionally, for both instruction methods, the sociodemographic characteristics of the participants were not effective in their success scores ($p>0.05$). This finding was important in terms of showing that the change that was found in the success scores of the participants originated only from the instruction methods. Although studies in the literature which provided an applied course to nursing students during the pandemic period and compared their success scores in two different methods of instruction are highly limited, the result in this study was compatible with those reported in similar studies. [30-33] In the study they conducted to determine difficulties experienced in nursing practices during the COVID-19 pandemic period, Liu et al. determined educational areas (satellite campuses) where students would take applied classes at a separate location. They found that the students had higher satisfaction levels with the application environments and the instructors. Additionally, the results of the qualitative data analyses they conducted showed that the nursing students gained significant knowledge and experience on the campuses, and they shared positive comments about their experiences. [30] Accordingly, it may be concluded that holding applied classes face-to-face will increase the success, experience, and satisfaction levels of students.

Another study determined that COVID-19 anxiety created a negative effect on the acquisition of occupational identity. This result was explained by the view that students take part in classes while they are experiencing concerns about their health, and they think they are not gaining qualifications in their application skills with this mindset. [31] Nevertheless, in addition to many psychological factors, success scores/grades play a significant part in the acquisition of occupational identity. [15] Therefore, in the process of providing students with occupational identity, it is highly important to teach practices effectively despite their concerns about Covid-19.

In this study, while the mean score of the participants after their face-to-face classes was 26.70 over 30 points, their mean score after their online distance education classes was 20.35. It is seen that the application success scores of the participants increased noticeably following face-to-face education. Thus, for preventing the job performance of nursing students starting their jobs after graduation from being affected, planning processes regarding orientation and in-service training opportunities at the beginning of the duties of students graduating around these times may differ. Accordingly, it is needed to investigate the topic of the occupational qualifications and attitudes of nursing students receiving education in this pandemic period regarding the pandemic.

In a systematic review, studies where nursing students were provided with blended education (distance education and satellite campuses), and their success levels were tested (studies in the period of 2005-2015) were examined. According to the authors, when blended education is used to manage and support distance education, it may affect the success of students in a positive direction. They also stated that there is a need for more studies on the effectiveness of education programs offered at satellite campuses for nursing students to help the improvement of future education practices. [34] With the effect of the COVID-19 pandemic, an increase has been observed in the number of studies conducted to investigate the effectiveness of blended education in nursing. According to the literature, blended education influences the course success of students in a positive direction. [32,33] Today, due to the ongoing pandemic conditions, the importance of satellite campuses is acknowledged even further. In our study, an implementation similar to the blended education model was carried out. The success scores

of the participants increased in face-to-face practices after distance education. Therefore, it may be seen that our findings were compatible with others reported in the literature.

The active participation of students in applied classes with face-to-face education in the classroom environment helps them gain the skills to re-formulate problems. This is because their inability to practice digital resources and take part in application-oriented discussions reduces their knowledge acquisition and critical behavioral skills. [28] Therefore, this study also aimed to measure the skills of the nursing students in making decisions in critical moments and approaching issues critically (triage, an organization at the scene of the incident, and among individuals). In this study, it was observed that the scores of the participants regarding critical thinking and critical decision-making increased after the application stage in the face-to-face education part of the study ($p<0.001$). Son (2020) also determined that providing learning for nursing students through laboratory simulations increased their learning attitudes and critical thinking behaviors significantly in comparison to distance education ($p<0.01$). [35] These results emphasize the importance of face-to-face education in instruction processes about first aid and emergency care courses in nursing education. Nevertheless, considering the ongoing pandemic conditions, it is believed that applying the blended education model will be useful.

Contributions of the Study to Nursing Practices

It is vital that face-to-face practices are not disrupted in nursing education in special conditions such as pandemics. In this context, different learning strategies are tried to be developed. With this study, the benefits of blended training in special conditions were seen and the study could be an exemplary training program for trainers.

Limitations

This study was carried out based on one applied course. Accordingly, the results may be strengthened by conducting studies with multiple courses in consideration. As this study was conducted with students registered for the First Aid and Emergency Care Nursing course at a university, studies to be carried out by including other applied courses may also utilize larger samples.

5. Conclusion and Recommendations

As uncertainties about the COVID-19 pandemic were still going on at the time of conducting this study, it is believed that this study will be guiding the teaching of applied courses in undergraduate nursing programs. Although web-based educational videos were utilized in this study after the theoretical instruction during the distance education process, this did not create the same success levels as those in face-to-face education. Therefore, for nursing students to be more active and qualified in practices and applications despite the ongoing pandemic period, face-to-face education is important. While preparations for transitioning back to face-to-face education continue in Turkey and other countries, infrastructure arrangements for nursing students to actively take part in applied classes in compliance with rules brought about in relation to the pandemic should be completed fast. In cases where face-to-face practices are not possible, it will be beneficial for students to receive support from resources such as simulated clinical environments and virtual reality scenario cases to improve their skill qualifications and learning outcomes. Nevertheless, in cases these simulation practices that are costly cannot be implemented, it is considered that the learning processes of students in the laboratory environment in small groups as in our study would be sufficient.

Interruptions in face-to-face education programs in extraordinary conditions such as a pandemic may also be in question in the future. This is why there is a need for studies where blended education models will be used in the strategic planning of educational activities. It is recommended that researchers conduct experimental studies on this topic with larger samples.

Ethical statement

For this study, approval from the Social Sciences and Humanities Ethics Committee of Bartın University (dated 31/05/2021, numbered 2021/09) and written permission from the institution where the study would be conducted were obtained. The participants were informed about the objective of the study and other necessary details, and their consent was received.

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Conflict of interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Authors' Contributions

Conceptualization: S.Ç, S.A., Ö.U.; Research design: S.Ç., S.A., Data collection and/or processing: S.A., Ö.U.; Analysis and/or Interpretation: S.Ç., E.K.; Literature Review: S.Ç., E.K., S.A., Ö.U; Writing up the original draft: S.Ç., A.A.; Review and Editing: S.Ç., E.K., S.A., Ö.U

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