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RESEARCH ARTICLE

EMERGENCY REMOTE TEACHING EXPERIENCES AND LEARNING MANAGEMENT SYSTEM ACCEPTANCE OF NURSING STUDENTS DURING THE COVID-19 PANDEMIC: TURKEY EXAMPLE

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ABSTRACT

Purpose: This study was conducted to evaluate the Emergency Remote Teaching **(**ERT) experiences of nursing students in the COVID-19 pandemic, to determine the acceptance levels of the Learning Management System (LMS) and to develop suggestions for future applications.
Methods: This descriptive study was carried out with 427 nursing students using the "Demographic Data Collection Form" and "Learning Management System Acceptance Scale (LMSAS)" forms between October and November 2020.
Results: The nursing students' 77.2% (n:301) are female. 23.3% (n:91) worried about not learning enough and not being a good nurse. The mean of the total scale score of LMSA is 64.77±14.74, which shows the students' average perceptions of acceptance. The students stated that they wanted to reduce the duration of the theoretical courses and to perform the applications in simulation laboratories or hospitals/ family health centers (FHCs).
Conclusions: Students' acceptance perceptions for LMS, which constitute the basic structure of distance education, were found at a moderate level. It is recommended that nursing faculties develop and implement support systems to increase the students' adaptation to the distance education process and to reduce their concerns.

Keywords: Distance learning, emergency remote teaching, nursing education

INTRODUCTION

The emergence of COVID-19 has required nursing faculties to be innovative and flexible in their education programs (1). Faculty members have had to move face-to-face courses to online platforms, offer alternative clinical experiences, and redefine how student performance is evaluated and graded with the pandemic (1,2). Faculty members have encouraged student participation by applying different strategies such as using games, refreshing

exercises, mind maps, role plays (3–11). Although higher education institutions providing nursing education have rapidly adopted online education and prepared programs during the COVID-19 process, many faculties offered their students online educational content without well-thought-out, durable learning plans (3,5). The transformation experienced in education in this process is not distance education but is named as "Emergency Remote Teaching-ERT" is defined as “temporary shifting of teaching to a temporary delivery mode because of crisis conditions” (6,7). Theoretical and practical courses planned with face-to-face education during the pandemic have suddenly been interrupted due to COVID-19, and nursing education, as all school levels, has switched to ERT (4,9).

Education has become an urgent matter. Moreover, educational technologies have been positioned at the forefront in case of emergency (12). The online platforms used in ERT and distance education are similar. Online courses, seminars and conferences have become possible with online platforms such as Zoom (zoomnow.net), Microsoft Teams, Skype, Blockboard, Moodle etc. (4,13). These online platforms have transformed traditional classrooms into virtual classrooms through technology. However, it is Learning Management Systems (LMS), a technology that enables online interaction and sharing of online resources, which is fundamental in distance education and ERT and promotes blended learning (14). It is argued that LMS encourages distance learners' self-learning (13).

This change in the pandemic process has revealed the concerns of the nursing educators in the education units whose education system quality is accredited by certain institutions about the status of their students' reaching the program outputs. Also, the ERT needs different program aims and outputs than current education system (6). Although the ERT approach in nursing has pragmatically affected thousands of people around the world, it has been little studied from the view of technical and theoretical competencies (4,7,15). In this context, how has the learning experience of students been affected in the ERT carried out during the pandemic process in this study? What topics can we discuss and develop for future distance learning applications? Answers were sought for these questions. It is thought that this study will contribute to the planning and the review of the distance education process of nursing education institutions.

The study was carried out to evaluate the ERT experiences of nursing students in the COVID-19 pandemic, to determine the acceptance levels of the LMS and to develop suggestions for future applications.

METHODS

Design

This study used a descriptive design.

Research Sample

The target population of the research consists of nursing students studying in Turkey during the COVID-19 pandemic. No sample selection was made in the study, and 427 volunteer nursing students filled out the questionnaire form on social media formed the sample of the study.

Ethical Considerations

The study was approved by the Non-Interventional Clinical Research Ethics Committee at a university in Turkey (decision no: 2020/83), and Approval was obtained from the Scientific Research platform on COVID-19 of the TR Ministry of Health (decision no: 2020 -07-16T18_54_07). This study was carried out in accordance with the Helsinki Declaration. The study was conducted based on volunteering, and the informed consent forms were received from the participants through Google Forms. The personal data of the participants were not obtained, and the collected data were not shared with any person or institution.

Data Collection

The study data were collected using Google Forms between October and December 2020. The links of the Google Forms for data collection tools were sent to the participants via social media (instagram, facebook etc).

Demographic Data Collection Form: The form was created in line with the literature data by researchers. It consists of 38 questions questioning some demographic informations (such as age, gender) and distance education experiences of the participants (1,3,4,13).

LMS Acceptance Scale: In order to determine the acceptance levels of students within the framework of the theory of unified acceptance and use of the technology model related to LMS, the "LMS Acceptance Scale", which was studied for validity and reliability by Sezer and Yılmaz (2019) (16), was

performed. The scale consists of 21 items and 4 sub-dimensions [Performance Expectation (items 1-8), Expectation of Effort (items 9-13), Social impact (items 14-16), Facilitating Situations (items 17-21)]. Each item of the scale has a 5-point Likert (I strongly disagree-I strongly agree) rating. In the evaluation of the scores obtained from the scale, 1.00-1.80 is interpreted as "Very low", 1.81-2.60 as "Low", 2.61-3.40 as "Intermediate", 3.41-4.20 as "High" and 4.21-5.00 as "They have very high perceptions of acceptance". A total score of 21-105 is taken from the scale. Higher scores on the scale indicate higher LMS acceptance among students. Cronbach's alpha values of the sub-dimensions of the scale were determined as 0.772, 0.813, 0.780, and 0.824. In this study, Cronbach's alpha value of the scale was 0.915 and Cronbach's alpha values of its sub-dimensions were 0.952, 0.324, 0.798, and 0.809, respectively.

Data Analysis

The data analyses were performed using the IBM SPSS Statistics for Windows 21.0 (IBM Corp., Armonk, NY, USA) software program, and $p<0.05$ was considered significant. Descriptive statistics were used for continuous variables (mean, SD), whereas frequency distributions were determined for categorical variables. The normality distribution of the study data was examined with the Shapiro Wilk Test. Distribution statistics (frequency, percentage, mean, standard deviation) and Chi-square, Kruskal-Wallis analysis, post hoc Mann-Whitney U-test analysis were performed in the analysis of the data.

RESULTS

Sociodemographic Data

The nursing students' 76.6% (n:327) were female, and their mean age was 20.35±1.58 years. Students' 23.4% (n:100) were first, 25.3% (n:108) were second, 32.8% (n:140) were third and 18.5% (n:79) are fourth-year students. The students' 26.5% (n:113) live in the Aegean region, 68.6% (n:293) study at universities in the Aegean region, and 93.4% (n:399) at state universities. 75.9% (n:324) of them live in the city. The income of 64.2% (n:274) of the students is equal to the expenses. The average of the students' general technology use skills was 3.47±0.93 out of 5 points. Their 63.5% (n:271) had not taken a distance education before.

Findings on the ERT Process

It was determined that 75.4% (n:322) of the students had not used LMS before the pandemic. Their 42.4% (n:181) used the sakai platform as the LMS. The students' 69.8% (n:298) felt anxious in the lessons. The most common reason for this feeling was the anxiety of not learning enough by 32% (n:346) and not being a good nurse by 29% (n:316).

When it was questioned how information sharing regarding the use of LMS in the ERT was realized, 44% (n:263) of the students were sent via video sharing and 40% (n:235) by publishing guides/directives. Students were expected to tick more than one option in determining the type of internet they preferred in ERT, and 57% (n:334) suggested home type Wi-Fi, 40.61% (n:238) mobile data and 2.39% (n:14) internet cafe. As the technological tools used in the ERT, the most smartphones (n:386), computers (n:274), tablets (n:18) and televisions (n:3) were determined, respectively.

Students' 48.85% (n:404) used lecture notes, 24.55% (n:302) videos, 19.95% (n:165) related research from Google academic and 5.56% (n:46) used articles and books uploaded to the LMS. The students' 63.5% (n:271) stated that ERT did not increase the clarity of the subjects. It has been determined that the students want online courses to be conducted in small groups by reducing the course duration. 31.1% (n:133) of the students stated that homework was used in the evaluation of the courses and 22% (n:94) stated that homework was mostly used together with the online exam. When their satisfaction with the assessment method of the ERT was questioned out of 10, the mean score was 5.35±2.61. 53.2% (n:227) of the students want online courses to be assessed by process evaluation.

50.6% (n:216) stated that online applied courses (OACs) could be carried out through LMS and performed by using 15.9% (n:68) lectures, 8.2% (n:35) nursing care plans, 5.6% (n:24) simulation, and 6.3% (n:27) case discussions teaching methods. The students' 68.6% (n:293) wanted to take the courses by practicing with voluntary consent at the hospital/FHC (family health center) instead of having OACs. 51.3% (n:219) of the students did not find OACs useful during the pandemic period and 92.3% (n:394) want to perform OACs in simulation

Table 1. Comparison of Difficulty in Accessing Technology by Region, Place of Residence and Income

Region	Difficulty in Accessing Technology						X^2	p
	Yes		No		Partially			
	n	%	n	%	n	%		
Mediterrenian	18	27.30	21	31.80	27	40.90	62.918	0.000*
Eastern Anatolia	23	54.80	6	14.30	13	31		
Aegean	20	17.70	48	42.50	45	39.8		
Central Anatolia	7	16.30	18	41.90	18	41.90		
Black Sea	5	12.80	16	41	18	46.20		
Marmara	9	20.50	20	45.5	15	34.10		
Southeastern Anatolia	44	55.00	11	13.80	25	31.30		
	Yes		No		Partially		X^2	p
Place of Residence	n	%	n	%	n	%		
Village	45	43.7	22	21.4	36	35	14.931	0.001*
City	81	25	118	36.4	125	38.6		
	Yes		No		Partially		X^2	p
Income	n	%	n	%	n	%		
Income less than expenses	54	50	18	16.7	36	33.3	36.116	0.000*
Income more than expenses	6	13.3	22	48.9	17	37.8		
Income equals expense	66	24.1	100	36.5	108	39.4		

***p<0.005, X^2= Chi-square analysis**

laboratories, by using personal protective equipment and obeying social distance rules.

Findings About the Lecturers

To reach the lecturer, 43.7% (n: 340) used e-mail, 39.97% (n:311) WhatsApp and 8.48% (n:66) LMS, respectively. Their 76.8% (n:328) wanted one-on-one online counselling.

To increase their motivation in ERT, 44.25% (n:296) the lesson plan was shared, 18.24% (n:122) weekly reminder messages, and 10.46% (n:70) mini quizzes before the lesson.

Findings Regarding the Learning Management System Acceptance Scale (LMSAS)

The students' total score on LMSAS was 64.38±14.63, which demonstrates the students' average perceptions of acceptance. Students' performance expectation subscale was 4.86±1.59 (high perception), the effort expectancy subscale was 3.16±0.59 (intermediate perception), the social impact expectation subscale was 1.64±0.58 (very low perception), the facilitating situations subscale was 3.20±0.84 (intermediate perception).

A significant difference was found when the region, place of residence and income of the students and their difficulty in accessing technology were compared (Table 1).

When the region of the university where the students were studying and the way the theoretical courses were given and the intelligibility of the theoretical courses were compared, a significant difference was found (Table 2).

No significant difference was found except for the facilitating situations subscale when the students' previous distance education courses were compared with the LMSAS total and subscale scores (KW: 4.071, p: 0.044). No significant difference was found when the students' general technology use skill scores were compared with the LMSAS total and subscale scores (KW: 0.348, p: 0.555). The mean scores of female students were statistically significantly higher in the total scale and subscales, except for the social impact subscale (KW:2.286

p:0.131, KW:14.069 p:0.000, KW:9.883, respectively). p:0.002, KW:10.109 p:0.000, KW:12.170 p:0.000).

The mean scores of the LMSAS total and sub-dimensions were compared with other variables (Table 3). A significant difference was found in the total scale, performance expectation and social impact subscales when LMSAS was compared with the regions where the universities were located (Table 3). It was determined, as a result of the advanced Mann-Whitney U test analysis, that it originated from the Aegean region (U:3484.5 p:0.004). Mean scores of the total scale, performance expectation and effort expectancy subscales of the senior students were significantly higher than the other grades (KW: 12,635, p:0.005; KW:8.618, p:0.035; KW: 17.506, p:0.001, respectively).

DISCUSSION

The acceptance level of nursing students, three-quarters of whom had never used LMS before, was found to be moderate for LMSAS that were used in ERT. As it is known, the Z generation is highly dependent on internet use and can follow technological developments closely and provide easier access to information (17). Considering that the students who experience ERT during the pandemic period are the Z generation, it is expected that the students have moderate acceptance, even though they do not know how to use LMS.

The mean scores of the students who were taking their education from the universities located in Aegean region, girls and seniors were found to be

Table 2. Comparison of the Way the Theoretical Courses and the Intelligibility of the Theoretical Courses According to the Region of the University

Region of the University	**the Way the Theoretical Courses**							
	Asynchronous		**Synchronous**		**Asynchronous and Synchronous together**			
	n	**%**	**n**	**%**	**n**	**%**	**X^2**	**p**
Mediterranean-East Anatolia-Southeast Anatolia	4	11.8	11	32.4	19	55.9	40.520	0.000
Aegean	4	1.4	116	39.6	173	59		
Central Anatolia	2	5.7	18	51.4	15	42.9		
Black Sea	4	9.8	1	2.4	36	87.8		
Marmara	1	4.2	12	50	11	45.8		
	Intelligibility of the Theoretical Courses							
	Yes		**No**					
	n	**%**	**n**	**%**			**X^2**	**p**
Mediterranean-East Anatolia-Southeast Anatolia	10	29.4	24	70.6			12.835	0.012
Aegean	123	42	170	58				
Central Anatolia	7	20	28	80				
Black Sea	11	26.8	30	73.2				
Marmara	5	20.8	19	79.2				

***p<0.005, X^2= Chi-square analysis**

Table 3. Comparison of LMS Acceptance Scale Scores by Other Variables

Regions of Universities	**n**	**Total Scale** **Mean±SD**	**Performance Expectation** **Mean±SD**	**Expectation of Effort** **Mean±SD**	**Social Impact** **Mean±SD**	**Facilitating Situations** **Mean±SD**
Mediterranean-East Anatolia-Southeast Anatolia**	34	57.47±17.31	4.05±1.59	2.97±0.66	1.51±0.62	2.94±1.16
Aegean	293	65.51±13.47	5.02±1.47	3.18±0.55	1.68±0.54	3.19±0.77
Central Anatolia	35	61.91±11.33	4.54±1.59	3.2±0.46	1.39±0.65	3.24±0.59
Black Sea	41	64.65±18.49	4.78±1.91	3.17±0.84	1.73±0.66	3.23±0.98
Marmara	24	63.58±18.72	4.61±1.98	3.01±0.65	1.53±0.66	3.55±1.02
		KW: 9.941 **p:0.019***	KW:13.795 **p:0.003***	KW:5.637 p:0.131	KW:9.847 **p:0.020***	KW:3.009 p:0.390
Status of taking courses with distance education before		**Total Scale**	**Performance Expectation**	**Expectation of Effort**	**Social Impact**	**Facilitating Situations**
Yes	156	64.62±13.90	4.79±1.53	3.15±0.57	1.65±0.56	3.31±0.88
No	271	64.25±15.06	4.90±1.62	3.16±0.61	1.64±0.59	3.14±0.80
		KW:4.901 p:1.6215	KW: 0.607 p:0.436	KW:0.002 p:0.961	KW:0.104 p:0.747	KW:3.142 p:0.806
Gender		**Total Scale**	**Performance Expectation**	**Expectation of Effort**	**Social Impact**	**Facilitating Situations**
Female	327	65.81±13.72	5.00±1.53	3.20±0.56	1.66±0.58	3.28±0.79
Male	100	59.73±16.49	4.40±1.67	3.00±0.68	1.57±0.56	2.95±0.94
		KW:14.069 p:0.000*	KW:9.883 p:0.002*	KW:10.109 p:0.001*	KW:2.286 p:0.131	KW:12.170 p:0.000*

*p<0.005, KW: Kruskall Wallis Test

** Few students were reached from these regions.

statistically significantly higher than the others. It is considered that the reason for this is more LMS infrastructure facilities in the universities in the Aegean region, the anxiety of the senior students about being successful in their profession at the graduation stage, and the fact that the professional values of female nursing students in the domains of care, professionalism, trust and emotionality are higher than male students (18). It was determined that students' technology use skills did not affect their LMS use. While the most used LMS is the sakai platform in Turkey during the pandemic process, in a study, it was stated that the most used LMSs in universities were AEMS (Advancity education management system) and live course softwares were Perculus and Big Blue Button (19). A similar result was obtained as the Sakai platform also uses the Big Blue Button live course software.

There were differences between regions in our country in terms of internet connection and technology access required for students to follow online courses, and it was revealed that students who studied at universities in Eastern and Southeastern Anatolia regions, lived in villages and had a low income, had more difficulties. Geographical inequalities in the eastern regions of Turkey and inadequacies in socioeconomic and telecommunication infrastructure put students at a disadvantage. Universities able to produce solutions to this situation, with the recommendation from the Council of Higher Education (CHE), that students go to the university closest to their region and benefit

from internet opportunities, and there is no obligation to attend online courses (20). However, this has been a time-consuming and costly solution for students that cannot be done every day. Alvarez (2020) and Kulikowski et al. (2021) studies also support our research findings (7,21).

Less than half of the students stated that the use of LMS was introduced through a guide or video, presentations about the course were usually shared, but the sharing of materials such as articles was very little and the satisfaction with the courses was moderate. In a study conducted in eighteen different countries, unlike our study, it was stated that, during the pandemic period, faculty members generally preferred to share the course content in the form of videos on social media platforms such as Facebook etc., and that the satisfaction level of students was found to be positive (19). In our study, more than half of the students also stated that the intelligibility of these courses was not sufficient, and therefore, they were worried about not learning nursing skills well and not being a good nurse in the future. Kulikowski et al. (2021), Alvarez (2020), Kurduncu and Kurt (2020) study findings support our findings (7,21,22). Moreover, they wanted OACs to be held face-to-face in hospital/FHC or simulation laboratories. Similarly, in the report of the Association of Nursing Education (HEMED) (2020), the importance of face-to-face practical lessons was emphasized (23). There are also studies in the literature that OACs can be applied to simulated patients with telehealth applications using virtual reality technologies, without the risk of virus transmission (4,10). In the US and UK examples, in line with the decisions taken by the nursing associations, the senior nursing students have completed their practical training by working as volunteer nurses in hospitals. It was also suggested that 50% of the applied courses could be done using simulation laboratories (24).

In line with our results, in a study, it was stated that students had difficulties in communicating with faculty members and friends and had problems maintaining motivation in online classes (25). Similarly, our findings, in another study that nursing students found the course durations long, they complained about their homework load, and they could not ask questions and discuss with their friends (26). Also, in our study, students wanted to have process evaluation. There is a publication indicating that different learner-centered pedagogical approaches such as the use of metaphors, which are more personalized, can be adapted to the needs and preferences of the students (15). Furthermore, in Kulikowski et al.'s study (2021), university students stated that they lacked information about what and how the instructors would learn in the course, and they emphasized that the most important aspect of the e-learning policy was not the use of the latest technology e-learning platform and technology, but the creation of a perception of order between the higher education institution and the students (21).

It was revealed that the average scores of the students studying in the Mediterranean, Eastern and Southeastern Anatolian regions of the LMSAS total, high level of performance and moderate effort expectation and facilitating situations sub-dimensions were lower than the other regions. It is thought that the reason why the sub-dimensions of LMSAS in all regions are medium and high is due to the fact that LMSs increase students' motivation and attention level and enable them to manage their time better with a more flexible learning environment. It is thought that the reason for the lower rates in the Mediterranean, Eastern and Southeastern Anatolian regions than in other regions is due to the impossibility of accessing the LMS. Social impact sub-dimension mean scores were found to be very low in all regions. It is understood from this data that LMS does not gain students the prestige specified in the social interaction subdomain. It is thought that the reason for this is the lack of interaction of students with each other during the pandemic process or the activities that will ensure the interaction of students through LMS. It is vital that this process is designed in advance and that pedagogical teaching methods are performed, that it is based on an education model, that students are informed about the use of LMSs, that instructors become competent by taking the necessary training in order for an effective and successful distance education process to take place (25). The world has become a different place after COVID-19, and nursing education should be more adaptable for new generations. More student-centered and active education methods should use by the help of social networking technologies, video sharing and game-based learning platforms, LMSs, video conference and virtual learning systems in nursing education (10,27,28).

Although the nursing students included in our study, which represent a large group, do not cover the general nursing student population of the country. Therefore, the study should be repeated using a

larger sample group covering all regions of the country and multicenters included in future research. The results of LMSAS couldn't be discussed with another study results due to lack of research.

Most of the nursing students had never experienced distance education before and the moderate perception of acceptance towards LMS indicates their willingness to use LMS. A significant portion of them experienced problems in accessing technological equipment during ERT and thought that they did not learn nursing skills adequately and worried about not being a good nurse. In case the online or hybrid learning continues, the duration of theoretical courses and the use of homework as an evaluation method should be reduced, a periodical process evaluation method should be use and the practical courses should be conducted in simulation laboratories or hospitals/ FHCs. It would be appropriate to develop support systems to increase students' adaptation to the distance education, and to diversify hybrid approaches that include blended learning that can encourage the use of LMS as a requirement of the 21st century education philosophy.

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