Experimental and Applied Medical Science, 3,3: 384-394, 2022. DOI 10.46871/eams.2022.44

The Effect of Nursing and Midwifery Students Attitudes Toward Information and Communication Technologies on Their Readiness for Mobile Learning

Aliye Bulut[1], Sema İcel[2], Zehra Cercer

[1]Gaziantep Islam Science and Technology University, Faculty of Medicine, Dept. of Public Health, Gaziantep/ Turkey

[2]Gaziantep Islam Science and Technology University, Faculty of Health Sciences, Dept. of Midwifery, Gaziantep/ Turkey

Abstract

The present study was conducted to determine how nursing and midwifery students' attitudes toward information and communication technologies affected their readiness for mobile learning. The population consisted of all the students studying in the Departments of Midwifery and Nursing, Faculty of Health Sciences, Gaziantep Islam Science and Technology University. A personal information form, which was prepared by the researchers upon the literature review and includes questions about the socio-demographic data of the students as well as the Information and Communication Technology Attitude Scale and the Mobile Learning Readiness Scale were used to collect the data (N=292). 62.5% of the participants were aged between 17-19 years. 83.7% of the participants were female and the remainder were male (n=283). The results of this study revealed that the students were partially/moderately ready for mobile learning. The students obtained a medium-high score concerning attitudes toward information and communication technologies. Consequently, based on findings of the present study and other studies, we think that online learning, e-learning and mobile learning environments have become more common in today's higher education system and it is necessary to assess experience, perception, attitude, skill, and readiness for these environments and to improve them along with the advancements in information and communication technologies.

Key words: *Mobile Learning, Information and Communication Technologies, Midwifery, Nursing, Attitude.*

** This paper was produced from project (number: 2021-TS-03) supported by The Scientific Research Projects Coordination Unit of Gaziantep Islamic Science and Technology University.*

***Corresponding author:** Aliye Bulut. e-mail: aliyedemirok@yahoo.com. ORCID ID:0000-0002-4326-0000.

1. Introduction

Computers and mobile technologies are time-saving, portable, and useful in many ways, thus resulting in becoming an essential part of people's lives (1,2). In a digitalizing world, people can quickly satisfy their learning and information needs by using computer and mobile technologies (3-5).

Mobile technologies have started to take their place in education systems because information can be easily accessed anytime and anywhere. Hence, students can maintain their learning activities through mobile learning even when face-to-face teaching is not possible (6). Mobile (or M-) learning refers to a form of learning that provides access to information through mobile technology without being tied to any specific location and is designed around the education that individuals need (7).

Technological advancements will be definitely more visible in the field of health in days to come, as are today (7). The use of mobile technology and learning has become more common in nursing and midwifery education, as in other areas (7, 8). Following developments in information and communication technologies (ICTs) and adapting mobile learning to nursing/midwifery education are predicted to be beneficial for an effective and rapid learning (3, 4, 9).

The recent increase in digitalization of education has led students and instructors to use mobile learning environments (10).

Meanwhile, as long as students have exhibited positive attitudes toward information and communication technologies and have become ready for mobile learning, they benefit from the effectiveness of learning environments more (3, 4, 9). This situation has required nurses and midwife instructors to conduct studies on information and communication technologies and mobile learning (7, 8).

Although students' attitudes toward information and communication technologies and their readiness for mobile learning have been studied, there is a limited number of studies on this subject. In the literature, no study has been found that included both nursing and midwifery students and investigated the effect of their attitudes toward information and communication technologies on their readiness for mobile learning. Once this objective is achieved, their competence in information technology and mobile learning and their attitudes towards them as well as the relationship of their competence and attitudes with socio-demographic factors can be determined and the related education plans can be made. In this context, the present study was conducted to determine how nursing and midwifery students' attitudes toward information and communication technologies affected their readiness for mobile learning.

2. Material and Methods

2.1. Location: Gaziantep Islam Science and Technology University, Faculty of Health Sciences

2.2. Time: The study was conducted between June 2021 and June 2022.

2.3. Population and sample: The population consisted of all the students studying in the Department of Midwifery and Nursing, Faculty of Health Sciences, Gaziantep Islam Science and Technology University (N=292). The sample consisted of the students who agreed to participate in the study (n=283).

Inclusion criteria were determined as follows;

- Being a student studying at Midwifery or Nursing Department of Gaziantep Islam Science and Technology University, Faculty of Health Sciences.
- Agreeing to participate in the study.

Exclusion criterion was below;

- Students who requested to withdraw from the study during the data collection process were not included in the study.

2.4. Design: This is a descriptive and cross-sectional study.

2.5. Those contributing to the study: The researchers took part in every stage of the study.

2.6. Data collection tools: A personal information form, which was prepared by the researchers upon the literature review and includes questions about the socio-demographic characteristics of the students as well as the Information and Communication Technology Attitude Scale and the Mobile Learning Readiness Scale were used to collect the data (1, 10). **Personal Information Form**; The form includes a total of 11 questions about the students' age, gender, family type, university year, and status of using internet, mobile device, and technology.

Information and Communication Technology Attitude Scale (ICTAS); The scale was developed by Günbatar. This five-point Likert type scale has 23 items and five subscales ("general tendency of ICT ", "access to information in virtual environment", "computer hardware", "use of software", and "communication in virtual environment") (10).

Mobile Learning Readiness Scale (MLRS)*;* Lin et al., (2016) developed the scale to determine the readiness of nursing students for mobile learning and Gökçearslan et al., (2017) adapted it to Turkish and conducted its validity and reliability study. While the original version of the scale has 19 items, its Turkish version has 17 items. The scale items are grouped under three subscales; "self-sufficiency (items 1-2-3-4-5-6), optimism (items 7-8-9- 10-11-12-13), and self-learning (items 14-15-16-17)". The Cronbach's alpha coefficient of the scale is 0.95. The items are rated in 7-point Likert type scale, ranging between (1) "strongly disagree" and (7) "strongly agree". The lowest and highest scores of the scale are 17 and 119 points, respectively (1).

2.7. Data Collection: The participants gave their consent by marking the statement "I agree to participate in the study" on the form. The data were collected by sending the data collection tools to the students through Google forms.

2.8 Data analysis: Statistical analysis of the data was performed using SPSS 22 software. The data were assessed at the confidence interval of 95% and significance level of 0.05. The distribution of the scale scores to the normal distribution was examined by Kolmogrov
Smirnov and Shapiro Wilks test, and their distribution was found to be suitable for normal distribution.

3.Findings

The results of the study indicated that 62.5% of the participants were aged between 17-19 years. 83.7% of them were female and the remainder were male. Table 1 shows socio-demographic characteristics of the participants.

Table 1. Some socio-demographic characteristics of the participants (N=283)

Socio-demographic Characteristics		**Number**	**%**
Age	17-19 years	177	62.5
	20-25 years	106	37.5
Gender	Female	237	83.7
	Male	46	16.3
Family Type	Nuclear Family	214	75.6
	Extended Family	69	24.4
Department	Midwifery	96	33.9
	Nursing	187	66.1
University year	1	142	50.2
	2	141	49.8

Table 2 shows the participants' status of using the internet, mobile device, and information and communication technology. 20.8% of the participants were connecting the internet or using mobile devices or information and communication technology for 6 or more hours. When the participants' reasons for using mobile devices were examined, 48.1% of them stated that they were using their mobile devices for communication purposes.

Table 3 shows the data on the readiness of the participants for mobile learning. There was a significant difference between their MLRS total scores in terms of the reason for using mobile devices and what devices they most used during their courses ($p<0.05$). The results of the TUKEY test applied to determine which group caused the difference indicated that the readiness level was significantly higher in those who were able to use mobile devices moderately than those who had poor ability to use mobile devices. Also, those who had good and very good ability to use these devices had a significantly higher level of readiness when compared to their counterparts with poor and very poor ability.

The readiness level of those who used most frequently smartphones, laptops, and tablets during their distance education courses was significantly higher than that of those who used desktop computers most frequently. Table 3 shows the data on the readiness of the participants for mobile learning.

There was a significant difference between their MLRS total scores in terms of the reason for using mobile devices and what devices they most used during their courses ($p<0.05$). The results of the TUKEY test applied to determine which group caused the difference indicated that the readiness level was significantly higher in those who were able to use mobile devices moderately than those who had poor ability to use mobile devices. Also, those who had good and very good ability to use these devices had a significantly higher level of readiness when compared to their counterparts with poor and very poor ability.

Table 2. The Participants' status of using Internet, Mobile Device, and Information and Communication Technology (N=283)

Characteristics		**Number**	**%**
How much time did you spend in front of a screen every day?	1 hour	11	3.9
	2 hours	36	12.7
	3 hours	55	19.4
	4 hours	63	22.3
	5 hours	59	20.8
	6 and longer	59	20.8
Ability to use mobile devices	Very poor	1	0.4
	Poor	10	3.5
	Moderate	154	54.4
	Good	96	33.9
	Very good	22	7.8
Reason for using mobile devices	Shopping	2	0.7
	Training and research	99	35.0
	Amusement	46	16.3
	Communication	136	48.1
What device did you use most during your distance undergraduate courses?	Smartphone	249	88.0
	Laptop computer	20	7.1
	Desktop computer	3	1.1
	Tablet computer	11	3.9
How good is the internet access where you live?	It's very difficult to access the internet	31	11.0
	I can't always access the internet	87	30.7
	I can often access the internet	110	38.9
	I can always access the internet	55	19.4
How fast is the internet connection where you live?	Very slow	15	5.3
	Slow	115	40.6
	Fast	147	51.9
	Very fast	6	2.1

The readiness level of those who used most frequently smartphones, laptops, and tablets during their distance education courses was significantly higher than that of those who used desktop computers most frequently.

Table 3. Distribution of data on the participants' MLRS mean scores in terms of their socio-demographic characteristics (N=283)

Characteristics		Total Readiness		p
		Mean	Standard Deviation	
Age	17-19	66.25	25.60	0.319a
	20-25	69.43	26.55	
Gender	Female	67.05	25.64	0.562a
	Male	69.48	27.74	
Family type	Nuclear Family	68.89	26.59	0.099a
	Extended Family	62.96	23.50	
Department	Midwifery	65.84	25.69	0.459a
	Nursing	68.26	26.13	
Grade	1	67.60	25.40	0.919a
	2	67.28	26.60	
How much time were you spending per day in front of a screen?	1 hour	67.45	25.66	0.378b
	2 hours	63.33	26.69	
	3 hours	64.29	25.55	
	4 hours	72.67	24.32	
	5 hours	64.90	27.07	
	6 hours and longer	69.85	26.42	
Ability to use mobile devices	Very poor			0.000b*
	Poor	46.50	17.71	
	Moderate	62.69	22.88	
	Good	74.25	26.76	
	Very good	81.00	32.84	
Reason for using mobile devices	Shopping	105.00	8.49	0.109b
	Training and research	67.81	28.91	
	Amusement	62.48	25.38	
	Communication	68.30	23.58	
What device did you most use in your undergraduate classes during distance education?	Smartphone	66.98	25.96	0.013b*
	Laptop computer	73.25	24.24	
	Desktop computer	26.33	15.31	
	Tablet computer	78.64	20.23	
How good is the internet access where you live?	It's very difficult to access the internet	58.13	26.50	0.101b
	I can't always access the internet	66.85	25.65	
	I can often access the internet	67.98	24.98	
	I can always access the internet	72.55	27.27	
How fast is the internet connection where you live?	Very slow	64.33	22.16	0.517b
	Slow	65.12	25.00	
	Fast	69.30	26.41	
	Very fast	74.17	41.39	

Table 4 shows the data related to the ICTAS scores of the participants. There was a significant difference between their ICTAS scores in terms of the time they spent in front of a screen every day, the ability to use mobile devices, and the status of accessing the internet where they lived ($p<0.05$). The results of the TUKEY test applied to determine which group caused the difference indicated that those who were spending 3, 4, and 6 or more hours in front of the screen every day had a significantly higher ICTAS total score compared to those who were spending 2 hours.

The ICTAS mean score was significantly higher in those who were able to use mobile devices at moderate, good, and very good levels than those who had poor ability to do. Moreover, those with good level of ability had a significantly higher ICTAS mean score compared to their counterparts with moderate level of ability. The ICTAS mean score was significantly higher in those who can't always access the internet when compared to those who had a hard time accessing the Internet. Furthermore, those who can always access the internet had a significantly higher ICTAS mean score than those who had a hard time accessing the Internet and those who can often access.

Table 4. Distribution of data on the participants' ICTAS mean scores in terms of their socio-demographic characteristics (N=283)

Characteristics		**Information Communication Technologies**		**p**
		Mean	**Standard Deviation**	
Age	17-19	71.09	19.42	0.191a
	20-25	74.22	19.42	
Gender	Female	72.33	18.82	0.895a
	Male	71.91	22.60	
Family type	Nuclear Family	73.43	19.21	0.076a
	Extended Family	68.65	19.87	
Department	Midwifery	72.31	19.99	0.975a
	Nursing	72.24	19.21	
Grade	1	71.15	19.06	0.334b
	2	73.38	19.83	
How much time were you spending per day in front of a screen?	1 hour	76.00	17.62	0.040b*
	2 hours	63.69	20.16	
	3 hours	72.71	19.52	
	4 hours	77.11	16.58	
	5 hours	71.17	19.73	
	6 hour and longer	72.29	20.64	
Ability to use mobile devices	Poor	47.90	13.56	0.000b*
	Moderate	69.66	19.17	
	Good	78.28	16.87	
	Very good	75.59	22.87	

Reason for using mobile devices	Shopping	95.00	8.49	0.159b
	Training and research	74.33	19.99	
	Amusement	69.30	20.94	
	Communication	71.42	18.39	
What device did you most use in your undergraduate classes during distance education?	Smartphone	71.51	19.45	0.118b
	Laptop computer	80.70	15.29	
	Desktop computer	60.67	34.27	
	Tablet computer	77.00	19.35	
How good is the internet access where you live?	It's very difficult to access the internet	65.13	19.98	0.011b*
	I can't always access the internet	73.43	19.30	
	I can often access the internet	70.29	19.21	
	I can always access the internet	78.38	18.36	
How fast is the internet connection where you live?	Very slow	71.00	21.79	0.661b
	Slow	70.82	18.68	
	Fast	73.29	19.62	
	Very fast	77.83	26.09	

Correlation analysis was performed to determine the correlation between the MLRS and the ICTAS, and the Pearson's correlation coefficient was obtained (Table 5). The overall MLRS had a positive significant correlation with the general tendency of ICT subscale by 57.4%, the access to information in virtual environment subscale by 60.1%, the computer hardware subscale by 13.5%, the use of software subscale by 49%, and the communication in virtual environment subscale by 41.6%.

Self-sufficiency subscale of MLRS had a positive significant correlation with the general tendency of ICT subscale by 55%, the access to information in virtual environment subscale by 54.1%, the computer hardware subscale by 14.8%, the use of software subscale by 48.4%, and the communication in virtual environment subscale by 38.7%.

Its optimism subscale had a positive significant correlation with the general tendency of ICT subscale by 54.7%, the access to information in virtual environment subscale by 58.8%, the use of software subscale by 45.7%, and the communication in virtual environment subscale by 38.1%.

Its self-learning subscale had a positive significant correlation with the general tendency of ICT subscale by 47.9%, the access to information in virtual environment subscale by 52.4%, the use of software subscale by 40.6%, and the communication in virtual environment subscale by 38.9%.

Table 5. Correlation between MLRS and ICTAS scores of the participants (N=283)

		General tendency of ICT	Access to information in virtual environment	Computer hardware	Use of software	Communication in virtual environment
Overall MLRS	r	.574**	.601**	.135*	.490**	.416**
	p	.000	.000	.023	.000	.000
Self-sufficiency	r	.550**	.541**	.148*	.484**	.387**
	p	.000	.000	.012	.000	.000
Optimism	r	.547**	.588**	.113	.457**	.381**
	p	.000	.000	.059	.000	.000
Self-learning	r	.479**	.524**	.111	.406**	.389**
	p	.000	.000	.063	.000	.000

4.Discussion

The results of this study were discussed with the relevant literature. In the present study, it was determined that most of the students were female. The similar studies reported that most of students were female (2,3,11,12). It can be asserted that this was associated with the fact that midwifery and nursing departments in Turkey are mostly preferred by female individuals. In this study, it was found that the students were partially/moderately ready for mobile learning. Among similar studies, the students were partially ready for mobile learning in the study by Yalçınkaya, most of the students were ready in the study by Zayim and Deniz, and the students were moderately ready in the study by Sırakaya and Alsancak Sırakaya (2,11,13). Different findings reported by in similar studies may have been associated with the course of technological advancements over time.

The results of the present study revealed that the students obtained a medium-high score from the ICTAS. In their study, Gündoğdu et al., stated that nursing students exhibited positive attitudes toward ICTs. In the study by Şahin et al., students' attitudes toward ICTs were highly positive. In another study conducted with nursing and midwifery students, they obtained low- medium scores from the ICTAS (2,4,14). In the light of these findings, it can be asserted that this result is associated with the fact that in this era, information and communication technologies are developing rapidly and university students show an intense interest in technological developments.

In the present study, no significant difference was found between the students' MLRS total and subscale scores and the variable of university year. Similar studies reported that there was a correlation between the university year and the scale scores (2,11,15).

Since the related university has recently been established, only first and second-year students have been studying. This is thought to be the cause of the difference.

In this study, it was determined that there was a significant difference between the students' MLRS total score and the most frequently used device by them. In the study by Yalçınkaya, it was reported that while there was no significant difference between using smartphone and the readiness scale total score, there was a significant difference between using laptop, desktop, and tablet computers and the readiness scale total score (11). The result might have been caused by the limited battery life and small screen size of smartphones.

In the present study, it was determined that there was a significant difference between the students' MLRS total score and their ability to use the mobile device. The readiness level of the students who were able to use mobile devices at very good and good levels was higher. It is suggested to organize trainings aiming to improve students' abilities to use mobile devices and information and communication technologies so that their readiness level can be elevated. In this study, it was determined that the total score of the scale was significantly higher in those who spent more times in front of the screen and were able to use mobile devices at very good and good levels. Likewise, in their study, Şahin et al., reported that when the students used the computer for longer period of times, their scale mean scores increased (4). It is an expected result that an individual who spends a great deal of time with technological devices has a positive tendency toward ICTs.

It was determined that the participants' levels in general tendency of ICT subscale of the ICTAS differed significantly in terms of the most frequently used device during distance education. The level of general tendency of ICT was significantly higher in those who used most frequently smartphones, laptop computers and tablet computers during distance education than their counterparts who used desktop computers most frequently. It was thought that general tendency of ICT increased since smartphones, tablets and laptops are portable and provide the opportunity to participate in educational environments at anytime.

In this study, it was found that the overall MLRS had a positive significant correlation with the general tendency of ICT subscale by 57.4%, the access to information in virtual environment subscale by 60.1%, the computer hardware subscale by 13.5%, the use of software subscale by 49%, and the communication in virtual environment subscale by 41.6%. Although there are studies examining the ICT-related skills, attitudes, and experiences of nursing and midwifery students, no study has been found that examines the correlation of ICT with mobile learning readiness. Therefore, the correlational analysis between the scales was discussed with the studies on different groups using similar scales.

A study examining education faculty students' attitudes toward distance education and readiness for e-learning in students from education faculty reported that there was a moderate correlation between attitude toward distance education and readiness for e-learning (16).

Likewise, the correlational analysis of the total and subscale scores of the scale revealed a moderate correlation. In Haznedar's study on university students, it was found that while the first-level variable predicting the skills of information and communication technologies was the experience of using computer, the first-level variable predicting the attitude toward e- learning was learning (17).

Consequently, based on findings of the present study and other studies, we think that online learning, e-learning and mobile learning environments have become more common in today's higher education system and it is necessary to assess experience, perception, attitude, skill, and readiness for these environments and to improve them along with the advancements in information and communication technologies.

References

1. Gökçearslan Ş, Solmaz E, Kukul V. Mobil Öğrenmeye Yönelik Hazırbulunuşluk Ölçeği: Bir Uyarlama Çalışması. Eğitim Teknolojisi Kuram ve Uygulama. 2017;7(1):143-157.
2. Zayım N, Özel D. Factors Affecting Nursing Students' Readiness and Perceptions Toward the Use of Mobile Technologies for Learning. Computers, Informatics, Nursing. 2015;33(10):456-464.
3. Çapık A, Çapık C, Kırbaş Y. Ebelik Ve Hemşirelik Bölümü Son Sınıf Öğrencilerinin Bilgi ve İletişim Teknolojilerine Yönelik Tutumlarının İncelenmesi. Anadolu Hemşirelik ve Sağlık Bilimleri Dergisi. 2018;21(3):163-170.
4. Şahin E, Yavan T, Demirhan M, Aydın M, Yeşilçınar İ. Hemşirelik Öğrencilerinin Bilgi ve İletişim Teknolojilerine Yönelik Tutumlarının Belirlenmesi. KSBD. 2020;12(22):193-202.
5. Tütüncü D, İleri YY. Sağlık Bilimleri Fakültesi Öğrencilerinin Bilgi ve İletişim Teknolojilerine Bakışı Üzerine Bir Araştırma: Konya İli Örneği. Online Türk Sağlık Bilimleri Dergisi. 2021;6(1):92-101.
6. Kılınç H. Mobil öğrenme: eğitim ve öğrenimin dönüşümü. Açıköğretim Uygulamaları ve Araştırmaları Dergisi. 2015;1(4):132-138.
7. Şahin G, Başak T. Hemşirelikte mobil öğrenme "m-öğrenme". İnternational Journal of Human Sciences. 2017;14(4):4481-4491.
8. Aytur Özen T, Kantek F. Türkiye'de Hemşirelik Ve Teknoloji Alanında Yapılan Çalışmaların İncelenmesi. Uluslararası Sağlık Yönetimi Ve Stratejileri Araştırma Dergisi. 2020; 6(3):395-410.
9. Kim JH, Park H. Effects of Smartphone-Based Mobile Learning in Nursing Education: A Systematic Review and Meta-analysis. Korean Soc Nurs Sci. 2019;13(1):20-29. doi: 10.1016/j.anr.2019.01.005. Epub 2019 Jan 16. PMID: 30659927.
10. Günbatar MS. Bilgi ve iletişim teknolojilerine yönelik bir tutum ölçeği geliştirme çalışması. Ahi Evran Üniversitesi Kırşehir Eğitim Fakültesi Dergisi. 2014;15(1):121-135.
11. Yalçınkaya T. Hemşirelik Öğrencilerinin Mobil Öğrenmeye Yönelik Tutum Ve Hazırbulunuşluk Durumlarının İncelenmesi. Ege Üniversitesi Sağlık Bilimleri Enstitüsü. Yüksek Lisans tezi, 2019.
12. Yiğit Ü. Hemşirelik Öğrencilerinin Mobil Öğrenmeye Yönelik Tutumlarının Belirlenmesi. Abant Journal of Health Sciences and Technologies. 2021;1(1):24-33.
13. Sırakaya M, Alsancak Sırakaya D. Mobil öğrenmeye hazırbulunuşluğun akıllı telefon kullanımına göre incelenmesi. Mehmet Akif Ersoy Üniversitesi Eğitim Fakültesi Dergisi. 2021;57:362-381.
14. Gündoğdu H, Erol F, Tanrıkulu F, Yağmur Filiz N, Kuzgun H, Dikmen Y. Hemşirelik öğrencilerinin bilgi ve iletişim teknolojilerine yönelik tutumlarının incelenmesi. International

Journal of Human Sciences. 2018;15(1):441-450.

15. Özkütük N, Orgun F, Baysan A. The readiness of nursing students for mobile learning: a cross-sectional study. Contemp Nurse. 2021;57(3-4):202-212. doi: 10.1080/10376178.2021.1987940.
16. Yakar L, Yıldırım Yakar Z. Eğitim Fakültesi Öğrencilerinin Uzaktan Eğitime Karşı Tutumlarının ve E- Öğrenmeye Hazır Bulunuşluklarının İncelenmesi. Mersin Üniversitesi Eğitim Fakültesi Dergisi. 2021;17(1):1-21.
17. Haznedar Ö. Üniversite Öğrencilerinin Bilgi Ve İletişim Teknolojileri Becerilerinin Ve E-Öğrenmeye Yönelik Tutumlarının Farklı Değişkenler Açısından İncelenmesi. Dokuz Eylül Üniversitesi Eğitim Bilimleri Enstitüsü Bilgisayar Ve Öğretim Teknolojileri Eğitimi Anabilim Dalı Bilgisayar Ve Öğretim Teknolojileri Öğretmenliği Programı. Yüksek Lisans Tezi, 2012.