

## Experience of distance learning during COVID-19 pandemic among undergraduate nursing students



Salmah A. Alghamdi<sup>1,\*</sup>, Mona M. Elhady<sup>2</sup>, Shahad S. Alghamdi<sup>1</sup>, Aisha Maqbool<sup>1</sup>, Shaima Abuduryhim<sup>1</sup>, Fatima Showeai<sup>1</sup>, Rasha Alsaigh<sup>1</sup>, Hanan Badr<sup>1</sup>

<sup>1</sup>Faculty of Nursing, King Abdulaziz University, Jeddah, Saudi Arabia

<sup>2</sup>Faculty of Nursing, Mansoura University, Mansoura, Egypt

### ARTICLE INFO

#### Article history:

Received 18 September 2021

Received in revised form

18 December 2021

Accepted 20 December 2021

#### Keywords:

Undergraduate students

Online education

Distance learning

Nursing students

COVID-19

### ABSTRACT

COVID-19 Pandemic has a huge influence on the learning process worldwide. To maintain student academic progress, learning activities were converted to distance learning to control the further spread of the COVID-19 virus. During this period several studies around the world were conducted to assess the effectiveness of distance learning. The results of these studies showed different perspectives, some of the students preferred e-learning while other preferred traditional methods. The aim of this study was to assess the experience of undergraduate nursing students who used distance learning during the COVID-19 pandemic. A quantitative, cross-sectional design was used to conduct the study. A convenient sampling approach was used to collect the data electronically via self-reported questionnaires. The study included 328 participants. The average score of the effectiveness domain was (2.58±0.68, medium level), and the satisfaction domain was (2.56±0.54, medium level). The results indicate that technical issues were the most significant barrier (75.6%) to distance learning, followed by physical problems, and decreased access to technological devices. Savings in transportation costs (74.1%), savings in time (71.6%), and the opportunity to review recorded lectures (67.4%) were the benefits of distance learning reported by nursing students during the COVID-19 pandemic. Most of the nursing students reported a positive preference for distance learning. Technical issues were the most significant barrier while decreased transportation costs were the most significant facilitator. These findings were consistent with other studies from different settings. Further research is needed to build upon these findings.

© 2022 The Authors. Published by IASE. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### 1. Introduction

On March 11, 2020, the World Health Organization (WHO) declared a state of the global pandemic because of the worldwide outbreak of the SARS-CoV-2 virus and the need to prevent and control the further spread of the virus (WHO, 2021). Then on March 15, 2020, the government commenced a lockdown that included mosques, airports, education facilities, recreational centers, schools, universities, and the pilgrimage (Diab and Elgahsh, 2020).

The pandemic had a huge impact on the teaching and learning process. To maintain student academic progress during the lockdown, teaching and learning were converted to online or distance learning (Diab and Elgahsh, 2020). E-learning can be defined as the use of technology to share learning materials, utilize discussion boards, and enhance understanding through the use of audio, chat, and video devices (Sindiani et al., 2020). With the development of this learning method and various ways of delivering knowledge, e-learning is considered a suitable substitute for traditional methods of learning. E-learning has different characteristics than traditional methods because it facilitates interactions between students and teachers by using an electronic network, saving travel time and expenses, and by offering more choices of classes to attend (Sindiani et al., 2020).

E-learning has altered the concept of information delivery and has proved that the learning process is not limited to face-to-face methods (Sindiani et al.,

\* Corresponding Author.

Email Address: [saalghamdi6@kau.edu.sa](mailto:saalghamdi6@kau.edu.sa) (S. A. Alghamdi)

<https://doi.org/10.21833/ijaas.2022.02.014>

Corresponding author's ORCID profile:

<https://orcid.org/0000-0002-4064-2724>

2313-626X/© 2022 The Authors. Published by IASE.

This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

2020). Universities around the world, and specifically in the Kingdom of Saudi Arabia (KSA), were obligated to use e-learning to deliver educational materials effectively (Sindiani et al., 2020). There are two other types of e-learning: distance learning, which is defined as the effort to provide learning access for geographically distant people; and a blended approach, which is a combination of the face-to-face and e-learning approaches that provides students increased satisfaction, performance, and engagement (Amir et al., 2020; Moore et al., 2011).

Even though e-learning facilitated the learning process, there were several barriers to the effective use of online learning during the COVID-19 outbreak. Some of these barriers were the high cost of the Internet and the lack of sufficient technical devices at home. For nursing students, e-learning was challenging when they tried to cover the objectives of clinical practice and establish their clinical experience (Adedoyin and Soykan, 2020). The most challenging problem for nursing students at the beginning of the COVID-19 pandemic was the halt of clinical training, which was designed to protect their health and to maintain citizen safety during the spread of the deadly virus, the foremost priority of the government (Lovrić et al., 2020). Practical and clinical learning was shifted to the virtual simulation without real contact with live patients in healthcare settings. Accordingly, e-learning was challenged to resemble on-campus teaching because of the need for the demonstration of skills in labs and clinical practice. These challenges may have had an impact on nursing students' learning outcomes and experiences.

## 2. Literature review

The following literature review focuses on preferences and effectiveness, facilitators, and barriers to distance learning. These studies were conducted in many countries around the world: Australia, Egypt, Greece, India, Indonesia, Jordan, Spain, Sweden, and Uganda. Some studies were conducted in various cities in Saudi Arabia, such as Al-Jouf, Jeddah, and Riyadh.

### 2.1. Preferences and effectiveness of distance learning

Ramos-Morcillo et al. (2020) conducted a study of bachelor's and master's degree nursing students in two public universities in Spain. They showed that most of the students preferred on-campus learning. There were several issues with e-learning, reported most often by the senior students; these included limited electronic resources related to living in rural areas (Ramos-Morcillo et al., 2020). Similarly, a study in Riyadh revealed that students preferred face-to-face over online learning (Shawaqfeh et al., 2020). Another study, conducted in Australia, revealed that there was no difference in academic performance between the two different methods of

learning-traditional methods and online learning-but undergraduate students preferred traditional methods (Kemp and Grieve, 2014). A study from Jordan (Sindiani et al., 2020) for undergraduate medical students found that 75% of the students did not prefer online learning and would not prefer it as a learning method in the future. However, 42% of those students preferred the blended approach, even as a future practice after the COVID-19 pandemic. Regarding ways to improve the online learning experience, the majority of students confirmed that a good technical setup, better class scheduling, more privacy, more frequent interaction, and an easier method of explanation and discussion could improve the experience of online learning (Sindiani et al., 2020). A study conducted in Indonesia with undergraduate dental students revealed that 44.2% of the students preferred distance learning over classroom learning. They accepted online learning and concluded that it was more favorable and more suitable than on-campus learning (Amir et al., 2020).

### 2.2. Facilitators of distance learning

Distance learning was conducted by nearly all teaching institutions worldwide during the COVID-19 pandemic. Distance learning provides many educational benefits, and it is considered an opportunity to learn without constraints that provides freedom and flexibility for students.

A study conducted in Jordan in 2020 of undergraduate medical students revealed that nearly half of the students (48.7%) reported positive experiences with online learning in terms of interactions. This was because distance learning helped provide the recommended social distancing, saved time, lowered transportation costs, and was considered an easier way of learning because lectures were more accessible and could be attended anywhere and anytime after they were recorded (Sindiani et al., 2020). Another study was performed with nursing students in Gothenburg, Sweden, who participated in the spring 2020 semester. This study mentioned similar findings of pre-recorded video lectures and electronic live lectures, reporting this was the most beneficial type of learning activity (Langegård et al., 2021). A study conducted in Uganda on undergraduate medical and nursing students attending university emphasized that e-learning could offer educational content, enable access to important information, and offer an interactive environment for educators and learners (Olum et al., 2020). A study in Indonesia of undergraduate dental students showed that the e-learning approach promoted and encouraged active self-directed learning. It has gained acceptance in dental education as an effective method of traditional learning (Amir et al., 2020). However, a study in Riyadh of professional pharmacy students of both genders showed that many factors affect the learning process, such as Internet quality, good infrastructure and technology, and the readiness of both instructors and students to use the technology

(Shawaqfeh et al., 2020). A study in Al-Jouf of both genders in all health specialties showed that distance learning allowed easy access to all learning materials. The study recommended the provision of training programs to help the nursing educators during periods of sudden changes in the educational approach. E-learning is considered a substitute method for instructors to avoid interruptions of the teaching and learning process (Abed et al., 2020).

### 2.3. Barriers

With the transition to distance learning, some barriers may hinder the teaching and learning process. A study that included all undergraduate health professional students at Jordanian governmental universities found that geographic location, lack of past experience with distance learning, and lack of past experience using online tools were the major barriers that students faced during online learning. A different study of undergraduate medical students in Jordan revealed that the reasons students were prevented from attending online classes were poor Internet connections, inadequate timing, lack of direct eye contact, lack of body language, and lack of clinical experience (Sindiani et al., 2020). The study of nursing students in Gothenburg, Sweden, confirmed some findings of the previous study in that the technical issues were relevant to the digital tools utilized for virtual lectures. Internet connection issues were also commonly mentioned as barriers (Langegård et al., 2021). Research on pharmacy students found that the main challenges facing students during distance learning were the lack of technical skills in using e-learning platforms, the lack of enthusiasm among some students for online learning, and the increase in the length of focus time needed during virtual classes (Ramos-Morcillo et al., 2020). The study in Uganda of undergraduate medical and nursing students stated that most of the participants perceived themselves as having only intermediate skills in using computers, Internet browsers, and platform programs. This study also showed that high Internet costs and poor Internet connections were major barriers to e-learning access (Olum et al., 2020).

A study performed in Jeddah, KSA, of medical students revealed that they were not given sufficient time to prepare for full-time virtual learning, nor for tolerating and adjusting to the total change in moving to e-learning. The medical instructors and students ended up needing to utilize virtual classes to proceed (Ibrahim et al., 2021). The study conducted in Al-Jouf, KSA, of both genders in all health specialties, noted that a large portion of the students faced difficulties with e-learning, for example, inconsistent access to the Internet, particularly for those with low income. They also experienced psychological problems, such as worrying about being unable to finish out the school year (Abed et al., 2020).

### 2.4. Research problem

The learning experiences for nursing students were altered because of the outbreak of COVID-19 and the transition to distance learning. There are a limited number of studies assessing the experience of distance learning among Saudi Arabian nursing students during this period. The aim of this study was to assess the experience of undergraduate Saudi Arabian nursing students with distance learning during the COVID-19 pandemic.

### 2.5. Research objectives

1. Assess the preferences for distance learning among undergraduate nursing students.
2. Assess the effectiveness of distance learning among undergraduate nursing students.
3. Assess the learning satisfaction with distance learning among undergraduate nursing students.
4. Assess the facilitators and barriers of distance learning.

## 3. Materials and methods

### 3.1. Research design

A quantitative, cross-sectional study was used to assess the experience of undergraduate nursing students in distance learning during the COVID-19 pandemic.

### 3.2. Sample

A convenience sampling technique was used. The participated students were from fourth-year, third-year, and second-year nursing from different four universities in the KSA.

### 3.3. Inclusion criteria

Criteria include undergraduate nursing students attending different Universities of both genders who are above age 18 and who experienced distance learning during the COVID-19 pandemic for at least one semester.

### 3.4. Sample size

The sample size was calculated using G\*Power software using an a priori analysis in which medium effect size=0.3, power=0.95, and alpha=0.05, yielding a recommended minimum sample size of 111.

### 3.5. Instrumentation

An electronic survey of 18 questions was designed by the researchers using Google Forms. The link was distributed through WhatsApp because WhatsApp is the most commonly used application for communication among students. The questionnaire was in English, and it contained the

following parts: A-general information including age, gender, year of study, and GPA score); and B-a distance learning questionnaire with the following parts: preference domain (2 items), effectiveness domain (4 items), learning satisfaction domain (6 items), barriers (10 items), and facilitators (4 items). The three domains of the distance learning questionnaire (preference, effectiveness, and learning satisfaction) were adapted from Amir et al. (2020) and were scored on a 4-point Likert-type scale ranging from 0=strongly disagree to 3=strongly agree. Permission to adapt the questionnaire was received from the original authors (Amir et al., 2020).

**3.6. Data collection procedure**

Data were collected electronically by the primary researchers from undergraduate nursing students attending the facility between February 2021 and March 2021 using a Google Forms survey. Electronic data collection was the most effective and safe method during the COVID-19 period.

**3.7. Data analysis**

Data were analyzed using SPSS version 23.0. The frequencies, percentage, mean, and standard deviation were computed for the items and for the domain of demographic factors. One-way ANOVA and an independent t-test were used to test differences in the domain in terms of demographic information. A chi-square test and a crosstab table were used to analyze the nominal data. A p-value equal to or less than 0.05 was considered statistically significant.

**3.8. Reliability and validity of the scale**

Internal consistency was used to test the validation of the scales. It was used to confirm that the designed items measured the same factors, and it tested how highly these items were correlated, and how well they predicted each other. Cronbach’s alpha was used for the distance learning scale to achieve significant and positive correlations between the items and the total score of the scale. It ranged

between (r=63, p<0.01) and (r=30, p<0.05). The Cronbach’s alpha was good (α=0.83), so it was confirmed that the scale was reliable.

**4. Results**

**4.1. Demographic information**

As shown in Table 1, the distribution of the participants was 328 nursing students: 81.4% were female and 18.6% were male. Of the students, 44.2% were fourth-year nursing students, 31.4% were third-year students, and 24.45% were second-year students. In addition, 7.9% were aged 18–19, 48.8% were aged 20–21, 33.5% were aged 22–23, and 9.8% were above 23 years. The range of GPAs can be broken down as follows: 46% of them received 4.06–5.00, 27.1% received 4.01–4.5, and the rest were below 3.06.

**Table 1: Demographic distribution of the studied sample**

Factor		Frequency	Percent
Gender	Male	61	18.60%
	Female	267	81.40%
Years of Study	Second year	80	24.45
	Third year	103	31.40%
	Fourth year	145	44.20%
Age	18–19	26	7.90%
	20–21	160	48.80%
	22–23	110	33.50%
	Above 23	32	9.80%
GPA	Less than 2	3	0.90%
	2.01–3.05	24	7.30%
	3.06–4.00	61	18.60%
	4.01–4.59	89	27.10%
	4.60–5.00	151	46.00%

**4.2. The descriptive analysis of preference domain of distance learning**

As shown in Table 2, the preference domain of distance learning was measured by two items using a 4-point Likert scale (0=strongly disagree to 3=strongly agree). The overall mean score of the preference domain was (2.67±0.70). The clarification session statement achieved the highest mean (2.76±0.81), more than the assessment statement (2.58±0.90; see Fig. 1).

**Table 2: Mean score of preference domain of distance learning among the studied sample**

Statement	N/%	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean±SD
Clarification is more suitable delivered by distance learning	N	30	65	187	46	2.76±0.81
	%	9.1	19.8	57	14	
Assessment is more suitable delivered by distance learning	N	50	81	153	44	2.58±0.90
	%	15.2	24.7	46.6	13.4	
Total Mean Score						2.67±0.74

**4.3. The descriptive analysis of effectiveness domain of distance learning**

As shown in Table 3, the effectiveness domain of distance learning was measured by four items using a 4-point Likert scale (0=strongly disagree to

3=strongly agree). The overall mean score was (2.58±0.68). The statement about having more time to prepare learning materials achieved the highest mean (2.98±0.86), while the “I do not experience any problems” statement achieved the lowest mean (2.16±0.93, low level; see Fig. 1).



**Table 3:** Mean score of effectiveness domain for distance learning among studied samples

Statement	N/%	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean±SD
I do not experience stress during distance learning	N	72	123	97	36	2.30±0.93
	%	22	37.5	29.6	11	
I do not experience any problems during distance learning	N	88	134	73	33	2.16±0.93
	%	26.8	40.9	22.3	10.1	
I have more time to prepare learning materials before group discussions with distance learning	N	23	57	153	95	2.98±0.86
	%	7	17.4	46.6	29	
I have more time to review all the learning materials after class with distance learning	N	33	55	156	84	2.89±0.90
	%	10.1	16.8	47.6	25.6	
Total Mean Score						2.58±0.68

**4.4. The descriptive analysis of satisfaction domain of distance learning**

As shown in Table 4, the satisfaction domain of distance learning was measured by six items using a 4-point Likert scale (1=strongly disagree to 4=strongly agree). The overall was 2.56±0.54, medium level. Statement 2 achieved the highest mean (2.84±0.88, medium level), and Statement 1 achieved the lowest mean (2.25±0.94, low level; see Fig. 1).

**4.5. The statistical differences in distance learning domains (preference, effectiveness, and satisfaction) according to studied sample demographic characteristics**

As shown in Table 4, the difference in distance learning (preference, effectiveness, and satisfaction) in terms of demographic factors using an independent t-test and one-way ANOVA was 0.05. Regarding the preference domain, the results showed significant differences in preference in terms of gender (t=-5.12, p<0.001); where the male was higher than female in the mean score (2.84±0.76 vs

2.63±0.76). Also, there were significant differences in preference in terms of years of study (F=3.95, p<0.05); the post-doc (Scheffe test) revealed that second-year students got the highest mean (2.83±0.73), and it statistically differed from fourth-year students (p<0.05). In addition, there were significant differences in preference in terms of age (F=4.61, p<0.05); the post-doc (Scheffe test) revealed that the 18-19-year-old group got the highest mean (3.13±0.36), and it statistically differed from the 20-21-year-old group (p<0.05). Finally, there were significant differences in preference in terms of GPA (F=3.88, p<0.05); the post-doc (Scheffe test) revealed that the 4.01-4.59 GPA group got the highest mean (2.86±0.36), and it statistically differed from the 4.60-5.00 GPA group (p<0.05).

In relation to the satisfaction domain, the results illustrate significant differences in satisfaction in terms of age (F=3.50, p<0.05); the post-doc (Scheffe test) revealed that the 18-19 group got the highest mean (2.83±0.38), and it statistically differed from the 20-21 group (p<0.05). However, there were insignificant differences in preference in terms of gender, years of study, and GPA (p>0.05).

**Table 4:** The differences in distance learning domains (preference, effectiveness, and satisfaction) according to studied sample demographic characteristics

Demographic Factors	Preference Domain			Effectiveness Domain			Satisfaction Domain			
	M	SD	Statistic	M	SD	Statistic	M	SD	Statistic	
			/p			/p			/p	
Gender	Male	2.84	0.66	t=2.03**/0.04	2.86	0.64	t=3.64**/0.00	2.68	0.51	t=1.86/0.06
	Female	2.63	0.76		2.51	0.68		2.54	0.55	
Years of Study	Second year	2.83	0.73	F=3.95**/0.02	2.61	0.67	F=5.59**/0.00	2.61	0.52	F=2.93/0.06
	Third year	2.71	0.68		2.74	0.67		2.64	0.52	
	Fourth year	2.55	0.78		2.45	0.68		2.48	0.57	
Age	18-19	3.13	0.36	F=4.61**/0.00	2.78	0.43	F=3.18**/0.02	2.83	0.38	F=3.50**/0.02
	20-21	2.58	0.74		2.49	0.68		2.49	0.52	
	22-23	2.72	0.73		2.58	0.65		2.61	0.6	
	Above 23	2.61	0.9		2.84	0.88		2.58	0.49	
GPA	Less than 2	2	1.73	F=3.88**/0.00	3	0.87	F=3.79**/0.01	2.61	0.77	F=0.60/0.64
	2.01-3.05	2.85	0.54		2.54	0.75		2.61	0.55	
	3.06-4.00	2.73	0.72		2.85	0.71		2.63	0.58	
	4.01-4.59	2.86	0.66		2.56	0.56		2.58	0.38	
	4.60-5.00	2.53	0.78		2.47	0.7		2.52	0.6	

Note: \*\*p<0.05

**4.6. Challenges experienced during distance learning (barriers)**

A Chi-square test and crosstab were used to test the differences in the answers. Challenges experienced during distance learning were measured by asking about nine barriers (Table 5). Technical issues were the most reported challenge (75.6%; p<0.05), followed by physical problems, such as back pain and eye strain, (75.6%; p<0.05),

and then poor Internet connection (47.5%; p<0.05). These three barriers were the most significant. Lack of body language communication was the fourth reported barrier (54.9%; p>0.05).

The rest of the barriers included the lack of a suitable environment for distance learning (35.1%; p<0.05) and the lack of access to technological devices such as a laptop or iPad (11.3%; p<0.05).

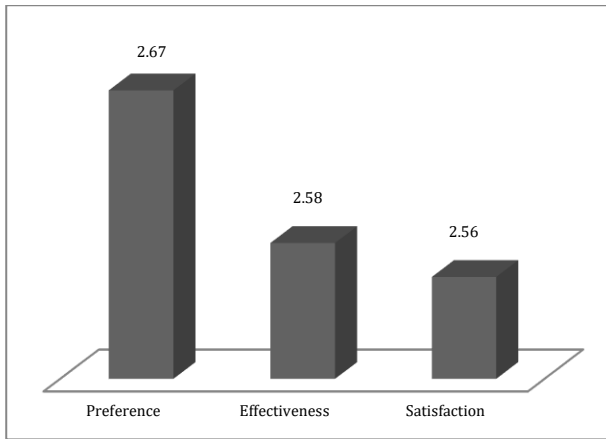


Fig. 1: Mean scores of distance learning domains

4.7. Positive aspects of distance learning (facilitators)

A chi-square test and crosstab were used to test the differences in the answers. Positive aspects (facilitators) of distance learning were measured by three items (Table 6). Reduced transportation cost was the most significant facilitator (74.1%; p<0.05), followed by saving time (71.6%; p<0.05), then lecture recording (67.4%; p<0.05).

Table 5: Challenges experienced during distance learning among the studied sample

Barrier		Frequency	Percent	X <sup>2</sup>
Technical issues	No	80	24.40%	**
	Yes	248	75.60%	
Lack of technological devices (laptop or iPad)	No	291	88.70%	**
	Yes	37	11.30%	
Internet access issues	No	262	79.95%	**
	Yes	66	20.10%	
Lack of body language communication	No	148	45.10%	ns
	Yes	180	54.90%	
Physical problems such as back pain, eye strain	No	139	42.40%	**
	Yes	189	57.60%	
Poor Internet connection	No	141	43.00%	**
	Yes	187	57.00%	
High cost of Internet service	No	273	83.20%	**
	Yes	55	16.80%	
Lack of experience in distance learning	No	220	67.10%	**
	Yes	108	32.90%	
Lack of suitable environment for distance learning	No	213	64.90%	**
	Yes	115	35.10%	

Note: \*\*p<0.05, ns=not significant

Table 6: Positive aspects of distance learning among the studied sample

Facilitator		Frequency	Percent	X <sup>2</sup>
Saves time	No	93	28.40%	**
	Yes	235	71.60%	
Reduces transportation cost	No	85	25.90%	**
	Yes	243	74.10%	
Lectures recorded	No	107	32.60%	**
	Yes	221	67.40%	

Note: \*\*p < 0.05

The preferences shown in this study were similar to those in a recent cross-sectional study conducted among medical and nursing students at a university in Uganda that assessed their preferences, awareness, and attitudes (Olum et al., 2020). That study found that most of the male students tended to prefer e-learning and stated that it could be utilized for sharing learning material and lectures.

In the current study, the barriers that nursing students experienced were technical issues, as the

5. Discussion

Distance learning and online learning were used by many countries worldwide including Saudi Arabia during the COVID-19 pandemic. This method of learning requires several factors to deliver high-quality learning, such as the quality and speed of the Internet, accessibility to online resources, availability of suitable educational online platforms, and applications to help both students and instructors (Shawaqfeh et al., 2020).

This study was conducted to evaluate the experiences of undergraduate nursing students with distance learning during the COVID-19 pandemic. The study measured five domains: Preference, effectiveness, satisfaction, barriers, and facilitators of distance learning. Among the study participants, females favored distance learning more than males in terms of preference and effectiveness. However, there were insignificant differences in satisfaction based on gender, years of study, and GPA; all at p>0.05.

most significant barrier, followed by physical problems such as back pain and eye strain, and then poor Internet connection, all with p<0.05. These findings correlate with the results of a cross-sectional study that was conducted among 221 participants at medical and nursing colleges. The preference for distance learning among medical and nursing students at the Uganda University was high. However, their preference regarding e-learning was a challenging one because of many barriers such as increased Internet charges, poor Internet connection, limited technical skills for the use of e-learning platforms, and challenges in accessing them (Olum et al., 2020). In line with this study, research by Gaur et al. (2020) in India found that nursing students were less likely to support distance learning because of many factors, such as the high cost of the Internet, the quality of the Internet, and limited skills pertaining to the use of computers and

devices (Gaur et al., 2020). In addition, Diab and Elgahsh (2020) assessed the preferences of students at a nursing college in Egypt for distance learning as well as the barriers they faced during the COVID-19 pandemic. The findings reflected that Internet cost, accessibility, and quality were the most noted obstacles that affected their experiences (Diab and Elgahsh, 2020).

Facilitators or positive aspects of distance learning were assessed among the participants. They agreed that the lower transportation cost was the most significant facilitator followed by saving time, and lastly by the opportunity to review recorded lectures. Nursing students appreciated distance learning for providing a chance for students to review each class, which helped them enhance their understanding, memorize the subject goals, and share their opinions with instructors and colleagues without being shy or afraid because they were behind a computer screen. These findings are supported by similar findings in a study in Jordan among medical students that showed that limiting unsafe social contact by social distancing (Sindiani et al., 2020). Additionally, Shawaqfeh et al. (2020) evaluated pharmacy students' experiences and found many positive aspects of distance learning that helped students have a great academic year during the pandemic. They agreed that saving time and reviewing lecture recordings were the greatest facilitators that encouraged them to improve their academic performance (Shawaqfeh et al., 2020).

### 5.1. Implications

This study has the potential to provide implications to help educational institutes, instructors, and students in various schools and colleges. The study highlights many aspects of distance learning that allow the application of high-quality learning. Our study revealed that most students reported that unsatisfactory distance learning experiences were related to technical issues like poor Internet connections, but that this could be resolved by courses that helped students master technical skills or a hotline that supported contact with experts to solve these issues. Other challenges mentioned in the study were the lack of access to the Internet or electronic devices. This study detected the need to improve technical issues and network access.

Recommendations include enhancing students' technological skills, improving the quality of network access by communicating with the Saudi Network Company, and facilitating access to educational platforms. Support systems should be established to enable low-income students to own electronic devices for educational purposes. Successful implementation of this study's recommendations would improve e-learning policy and education, which requires that students be skilled in various technologies, for example, the use of digital libraries and Blackboard.

### 5.2. Limitations

One of this study's limitations is the use of a cross-sectional design that makes no causal inferences. Another limitation is the unequal distribution of females and males; however, this imbalance accurately represents the population of nursing students at the involved school. A further limitation may be the limited number of questions on the self-administered questionnaire.

### 6. Conclusion

The study evaluated and highlighted the preference, effectiveness, satisfaction, barriers, and facilitators perceived by Saudi Arabian nursing students when they engaged in distance learning. The findings showed that nursing students have a positive attitude toward the effectiveness of distance learning. Barriers that were mentioned included technical issues followed by physical problems. However, significant facilitators of learning were decreased transportation costs, time saved for other activities, and the opportunity to review recorded lectures. Findings from this study will be useful in improving the quality of online learning in the near future. This is important because online learning platforms might be the best mode of learning and teaching for ensuring the continuity of the learning process during unexpected events such as the COVID-19 pandemic. Future research should consider a mixed-method approach to traditional and online learning to mine the information retrieved from the students.

### Compliance with ethical standards

#### Ethical considerations

Ethical approval was obtained from the Nursing Research Ethical Committee at the faculty of nursing, King Abdulaziz University, Jeddah, Saudi Arabia, serial number (2B. 43). All participation was completely voluntary and anonymous. Participants were assured that their information was used confidentially, and their participation would not influence their grades or student status. Interested participants read and approved the informed consent form with detailed information about the study before filling out the electronic survey.

#### Conflict of interest

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

#### References

- Abed SN, Ali SAA, and Diab SSEM (2020). Students' experience regarding e-learning during the covid-19 pandemic at Jouf University, Saudi Arabia Kingdom. *PalArch's Journal of Archaeology of Egypt/Egyptology*, 17(6): 1-14.

- Adedoyin OB and Soykan E (2020). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments*, 1-13.  
<https://doi.org/10.1080/10494820.2020.1813180>
- Amir LR, Tanti I, Maharani DA, Wimardhani YS, Julia V, Sulijaya B, and Puspitawati R (2020). Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. *BMC Medical Education*, 20: 392.  
<https://doi.org/10.1186/s12909-020-02312-0>  
**PMid:33121488 PMCID:PMC7594975**
- Diab GMAEH and Elgahsh NF (2020). E-learning during COVID-19 pandemic: Obstacles faced nursing students and its effect on their attitudes while applying it. *American Journal of Nursing*, 9(4): 300-314. <https://doi.org/10.11648/j.ajns.20200904.33>
- Gaur R, Mudgal SK, Kaur S, and Sharma R (2020). Undergraduate nursing students' attitude towards online classes during lockdown period in India: Imposed or interested. *International Journal of Community Medicine and Public Health*, 7(9): 3371-3377.  
<https://doi.org/10.18203/2394-6040.ijcmph20203892>
- Ibrahim NK, Al Raddadi R, AlDarmasi M, Al Ghamdi A, Gaddoury M, AlBar HM, and Ramadan IK (2021). Medical students' acceptance and perceptions of e-learning during the Covid-19 closure time in King Abdulaziz University, Jeddah. *Journal of Infection and Public Health*, 14(1): 17-23.  
<https://doi.org/10.1016/j.jiph.2020.11.007>  
**PMid:33341480 PMCID:PMC7836241**
- Kemp N and Grieve R (2014). Face-to-face or face-to-screen? Undergraduates' opinions and test performance in classroom vs. online learning. *Frontiers in Psychology*, 5: 1278.  
<https://doi.org/10.3389/fpsyg.2014.01278>
- Langegård U, Kiani K, Nielsen SJ, and Svensson PA (2021). Nursing students' experiences of a pedagogical transition from campus learning to distance learning using digital tools. *BMC Nursing*, 20: 23.  
<https://doi.org/10.1186/s12912-021-00542-1>  
**PMid:33468132 PMCID:PMC7814979**
- Lovrić R, Farčić N, Mikšić Š, and Včev A (2020). Studying during the COVID-19 pandemic: A qualitative inductive content analysis of nursing students' perceptions and experiences. *Education Sciences*, 10(7): 188.  
<https://doi.org/10.3390/educsci10070188>
- Moore JL, Dickson-Deane C, and Galyen K (2011). E-Learning, online learning, and distance learning environments: Are they the same? *The Internet and Higher Education*, 14(2): 129-135.  
<https://doi.org/10.1016/j.iheduc.2010.10.001>
- Olum R, Atulinda L, Kigozi E, Nassozi DR, Mulekwa A, Bongomin F, and Kiguli S (2020). Medical education and E-learning during COVID-19 pandemic: Awareness, attitudes, preferences, and barriers among undergraduate medicine and nursing students at Makerere University, Uganda. *Journal of Medical Education and Curricular Development*, 7: 1-9.  
<https://doi.org/10.1177/2382120520973212>  
**PMid:33283049 PMCID:PMC7682244**
- Ramos-Morcillo AJ, Leal-Costa C, Moral-García JE, and Ruzafa-Martínez M (2020). Experiences of nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to COVID-19 in Spain. *International Journal of Environmental Research and Public Health*, 17(15): 5519.  
<https://doi.org/10.3390/ijerph17155519>  
**PMid:32751660 PMCID:PMC7432480**
- Shawaqfeh MS, Al Bekairy AM, Al-Azayzih A, Alkatheri AA, Qandil AM, Obaidat AA, and Muflih SM (2020). Pharmacy students perceptions of their distance online learning experience during the COVID-19 pandemic: A Cross-Sectional Survey Study. *Journal of Medical Education and Curricular Development*, 7: 1-9.  
<https://doi.org/10.1177/2382120520963039>  
**PMid:33088916 PMCID:PMC7543106**
- Sindiani AM, Obeidat N, Alshdaifat E, Elsalem L, Alwani MM, Rawashdeh H, and Tawalbeh LI (2020). Distance education during the COVID-19 outbreak: A cross-sectional study among medical students in North of Jordan. *Annals of Medicine and Surgery*, 59: 186-194.  
<https://doi.org/10.1016/j.amsu.2020.09.036>  
**PMid:33042535 PMCID:PMC7531436**
- WHO (2021). Coronavirus disease (COVID-19) pandemic. World Health Organization, Geneva, Switzerland.