

Effect of Obstacles Faced Nursing Students related Applying E-learning during COVID-19 Pandemic on their Attitudes

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Abstract

Background: E learning is a formalized teaching with the aid of electronic resources where in education can be delivered to large number of students (the target audience) at same or different time. The synchronized e-learning was the panacea at the time of the covid- 19 pandemic. However, it negatively influenced the learners' performance, attitude and learning outcomes. **Aim:** To assess the effect of obstacles faced nursing students related applying e-learning during COVID-19 pandemic on their attitudes. A descriptive correlational study design was used. The research was carried out at Benha University's Faculty of Nursing in Egypt. **Subjects:** During the academic year 2020/2021, a stratified random sampling technique was used to choose 25% of students from each of the four academic years enrolled in the Faculty of Nursing at Benha University. **Tools:** Interviewing questionnaire, attitude towards e-learning scale and obstacles of e-learning questionnaires. **Results:** 55.5 % of students expressed negative attitudes regarding e-learning, according to the findings. The highest level of total obstacles presented among academic students in the first year (66.8%) and the lowest level of total obstacles presented among academic students in the fourth year (57%) were encountered by nursing students when using e-learning. The most common dimensions of obstacles to e-learning were infrastructure and technological advancements, technical and managerial assistance and instructors' characteristics (88.2%, 86.3% and 83.3% respectively). **Conclusions:** There was a highly statistically significant negative correlation between obstacles facing nursing students and their attitudes towards e-learning. **Recommendation:** In light of the uniqueness of learning programs, the study proposes that higher education institutions improve their e-learning strategy in order to encourage students' academic achievement.

Keywords: COVID-19, E-Learning, Nursing Students, Obstacles, Attitudes

1.1. Introduction:

COVID-19 is caused by a novel coronavirus strain that originated in Wuhan, China. COVID-19 was labelled a pandemic on March 11, 2020, due to its uncontrolled global expansion. Since the beginning of the pandemic, approximately, 79.2 million COVID-19 cases have been documented worldwide, with over 1.7 million deaths. The researchers saw the greatest weekly average of 4.3 million confirmed new cases in December 2020 than at any other time. Despite the fact that more than a hundred vaccine candidates are in various stages of development, this dreadful ailment has yet to improve due to lack of adequate therapy and drugs (Chen et al., 2020).

The advent of the COVID-19 pandemic has resulted in the temporary closure of schools and universities around the world in order to combat the spread of the coronavirus and maintain safe social and physical distance, affecting billions of children and students (Li & Lilani, 2020). Due to the spread of the epidemic and the requirement for

academic continuity, educational institutions have swiftly turned to distance and online learning. While public health professionals generally believe that the best way to combat COVID-19's broad threat is to use social distancing measures, implementing emergency e-learning protocols does not directly affect the pandemic, but does indirectly by limiting face-to-face classroom encounters (Subedi et al., 2020).

During this epidemic, e-learning tools are critical; they attempt to assist instructors, schools and universities in facilitating student learning during periods when universities and schools are closed. Furthermore, the majority of platforms are free, which can assist in maintaining continuous learning during the coronavirus pandemic (Almaiah et al., 2020).

E-learning, often known as online education, is the process of acquiring and disseminating knowledge through the use of electronic resources such as the internet, computers and smartphones. E-learning, when enhanced with audiovisual

features can give educational content as well as numerous examinations to support these contents, also, enable access to vital relevant information and most significantly, provide an interactive environment for students and instructors (Olum et al., 2020). It is a powerful tool that transforms traditional learning methods by strengthening teaching and learning capacity. It also includes interactivity and active learning, which encourages students and instructors to collaborate and share ideas (Abd El-Hamed & Elgahsh, 2020).

E-learning is a type of online learning that can be done in two ways: Synchronous or asynchronous. Synchronous learning occurs when the teacher is teaching and the students are learning at the same time. This enables for direct communication between the teacher and the student via the internet and intranet. Synchronous e-learning training is commonly utilized in online university classes or lectures for seminars or conferences, which are sometimes known as web conferences or webinars. Asynchronous learning occurs when the teacher and learner work at different times. This activity is more common in the field of e-learning since it offers greater benefits to trainees by allowing them to receive instruction at any time and from any location (Prestiadi, 2020).

Numerous obstacles and challenges are associated with the quick move to online education. However, because no one knows when the pandemic will be over, educational institutions around the world have chosen to construct online learning resources for students from all academic subjects using the digital tools already accessible (Kaur, 2020).

Instructors, without a doubt, play a critical role in a successful transition from on-campus to online classes. However, several studies have identified teachers' resistance to new technologies as one of the most significant barriers to implement online educational programs. Personal barriers (internal variables connected to personal traits and behavioral habits of teachers), attitudinal barriers (internal factors related to personal characteristics and behavioral habits of instructors) and technological constraints (internal factors related to attitudes and viewpoints of faculty members regarding features of the online learning environment), as well as contextual obstacles (external factors associated with a lack of technical and organizational supports by the institution offering online courses) (Esfijani & Zamani, 2017).

Students' learning motivation and attitudes during online learning are linked and these elements have an impact on their ability to take online classes or use online learning platforms. To maintain students' motivation and minimize monotony, the instructor must make studying as appealing as feasible, especially since students must quickly adjust to

online learning methods (Agustina & Cheng, 2020) ; (Paceet al., 2020). Instructors should employ a variety of tools to increase student engagement in online classes, including animation, visualization, video, audio and documents. Furthermore, for effective content distribution, technology gadgets, program design, instructor selection, interactive curriculums and supportive stakeholders are necessary (Huang et al., 2020).

Community health nurses play an important role in remote education (E-learning), as they should be conversant with digital skills that are based on interactive e-books. The following is an example of this role: Supporting learners in the use of appropriate technologies and educational technology tools to obtain educational materials and assigned courses is a technical responsibility. Teaching role entails communicating with students on a regular basis and informing them of the lecture schedule and any daily changes that may occur, continuously motivating and supporting students and assessing their progress in learning, allocating time for discussions in order to answer questions and promote active participation and learner motivation and supervisory role entails administrative follow-up to all of the above to ensure that all of the above is done correctly (United Nations Educational, Scientific and Cultural Organization (UNESCO), 2020).

Significance of the study: -

Faculty, students and teachers were all affected by the COVID-19 pandemic and Egypt's Ministry of Higher Education realized the necessity to introduce e-learning at public universities to keep the teaching and learning process going. Although the universities had little or no experience with e-learning and were unprepared for the use of e-resources in the teaching and learning process, they faced challenges and impediments, particularly when teachers and students did not grasp how to use online applications (Zaharah et al., 2020).

With the World Health Organization declaring the COVID-19 pandemic and the lifting of preventive measures in many Arab countries, including the complete closure of schools and universities in some countries, the Ministry of Higher Education in Egypt has been urged to use e-learning to ensure the continuity of the educational process and avoid students losing an academic year. Educational institutions are faced with overcoming obstacles in their educational systems and this pandemic will have an impact on education, with a reduction in national tests in particular (Sintema, 2020). As a result, Benha University's Faculty of Nursing intended to implement and use an e-learning system to finish the teaching of courses for all of their students. So, the present study aimed to assess the effect of obstacles faced nursing students related applying e-learning during COVID-19 pandemic on their attitudes.

1.2. Aim of the Study

The aim of this study was to assess the effect of obstacles faced nursing students related applying e-learning during COVID-19 pandemic on their attitudes.

1.3. Research Question

1. What are the attitudes of nursing students about e-learning?
2. What are the most common obstacles that nursing students confront when using e-learning?
3. What is the relationship between nursing students' attitudes regarding e-learning and the obstacles they face?
4. Is there a relationship between the demographics of the students, the obstacles they face and their attitude toward e-learning?

2. Subject and Methods

2.1. Research Design

The study used a descriptive correlational research design.

2.2. The Study's Variables

2.2.1. Independent Variable

Students characteristics, technical and managerial assistance, infrastructure and technological advancements, curriculum material and instructors' characteristics were among the factors of e-learning obstacles.

2.2.2. Dependent Variable

Attitudes towards e-learning.

2.3. Setting

The research was carried out at Benha University's Faculty of Nursing, Egypt.

2.4. Subjects

During the academic year 2020/2021, a stratified random sampling technique was used to choose 25% of students from each of the four academic years enrolled in the Faculty of Nursing at Benha University. The sample size was 614 students (193 from first year students, 171 from second year students, 136 from third year students and 114 from fourth year students) out of 2459 students enrolled in the Baccalaureate nursing program, Faculty of Nursing, Benha University (772, 685, 543, 459, respectively). Students enrolled in the first to fourth years of nursing accept participation in the above-mentioned setting.

2.4.1. Inclusion Criteria

Students agreed to participate in the research study and applied electronic learning. They were enrolled in the academic year 2020-2021.

2.4.2. Exclusion Criteria

Students refused to engage in the research.

2.5. Tools of Data Collection

Three data collection tools were used to achieve the study's aim.

2.5.1. Assessment Sheet is the first tool

The researchers created this sheet based on relevant literature. Age, sex, residence, marital status, academic years, devices for e-learning activities, internet access at home, and years of computer experience were among the personal factors covered.

2.5.2. Attitude towards E-Learning Scale is the second tool. The researchers designed it based on relevant literature. It comprised of 18 questions designed to assess nursing students' attitudes about e-learning. It was divided into three categories: E-learning usefulness (6 items), e-learning is simple to utilize (6 items) and behavioral intention (6 items).

Scoring system:

The participants' responses were graded on a five-point Likert scale ranging from "1" (strongly disagree) to "5" (strongly agree). The total score was divided by the number of items, giving a mean score for each e-learning domain, as well as mean overall scores, which were obtained by adding all three domains and giving an overall score for student attitudes toward e-learning. These numbers were then transformed to a percentage. Scores of less than 60% were considered negative attitudes toward e-learning, whereas scores of 60% and higher were considered good attitudes.

2.5.3. Obstacles of E-learning Questionnaire are the third Tool. The researchers designed it based on relevant literature. It comprised of 35 questions aimed at identifying obstacles faced by nursing students when using an e-learning system to combat the COVID-19 epidemic. There were five dimensions to it: 7 items for students' characteristics, 7 items for technical and managerial assistance, 7 items for infrastructure and technological advancements, 7 items for curriculum material and 7 items for instructors' characteristics.

Scoring system:

The participants' responses were graded on a five-point Likert scale ranging from "1" (strongly disagree) to "5" (strongly agree). The items' scores were added up and the total divided by the number of items, giving a mean score for each dimension of the e-learning barriers. These numbers were then transformed to a percentage. If a score of 60% or above, it means that obstacles occurred during the application of the e-learning system and if a score of less than 60%, it means that obstacles did not exist.

2.6. The Instrumentation's Validity and Reliability

2.6.1. Validity

To assess the content validity of the tools, the current study was sent to Five Academic Nursing Professionals in the field of Community Health Nursing. All suggested changes were made in accordance with the Academic Nursing Experts' judgments on sentence clarity and content appropriateness.

2.6.2. Reliability

The tools' internal consistency was measured using Cronbach's Alpha Coefficient approach to determine their

reliability. For the e-learning attitude tool, this was ($= 0.92$) and for the e-learning obstacles tool, it was ($= 0.83$). This suggests that the study instruments are extremely reliable.

2.7. Pilot Study

After the tools were developed and before the real data gathering begin, a pilot study was done. The pilot study was conducted on 10% of the sample (61) students who were included in the main study sample despite not making any changes to the study materials.

2.8. Fieldwork

Data was collected over a three-month period, beginning in February 2021 and ending in April 2021. The questionnaires distributed via an e-mail containing an electronic form to all student participants who were chosen based on their availability and capacity to communicate electronically. The purpose of the study was explained in the email to the student recipients, which also included an informed consent statement. The consent statement also included the researchers' name and contact information, which delivered to the recipients through E-mail, Facebook, or WhatsApp. Students might use this information to contact the researchers if they had any questions or concerns about the research. The announcement also makes it clear that taking part in the study is entirely voluntary. When recipients started a survey, they were told that they could stop at any time and there would be no consequences.

2.9. Ethical and administrative considerations

The Dean of the Nursing Faculty at Benha University gave written permission to gather data from the student's Nursing College. The study was carried out with great care, paying close attention to research ethics and the participants' rights to accept or reject to participate in the study, as well as the fact that their information would be kept confidential and used only for research purposes. The anonymity of the respondents was preserved because they were not obliged to give their identities.

2.10. Statistical Analysis

The data was collected and entered in a computer. The Statistical Package for Social Science (SPSS/version 26) was used to conduct the statistical analysis. The mean and standard deviation ($X \pm SD$) were used to express quantitative data. Numbers and percentages were used to represent qualitative data. The chi-square test and the ANOVA test were used to make a comparison. Pearson's correlation coefficient was used to assess the correlation between variables (r). The level of significance was determined using a P-value of 0.05.

3. Results:

Table 1 shows the demographics of the students who were studied. It clears that; 53.7% of the studied students aged ≤ 20 years old with the mean $\pm SD$ was 18.42 ± 1.37 ,

58.7% of them were females and 95.8% were singles. In regards of residence, 69% of the students' studied were from rural areas and 31.4 % were in the first year. In regards of e-learning devices, 64.1 % of the students' studied had a mobile device for their e-learning activities and 60.1 % of them had access to the internet at home. In terms of years of computer experience, 52.7 % of the studied students had five years or more of experience.

Table 2: The highest mean score (3.04 ± 0.98) among the third-year students was in the item of e-learning was a valuable learning instrument in delivering distance education, as revealed by the mean score of attitudes toward e-learning items among the researched students. Also, the highest mean scores (3.13 ± 0.38 & 3.02 ± 0.34 respectively) in the item of e-learning enhanced my success in my study and the highest mean scores (3.24 ± 0.30 & 3.12 ± 0.26 respectively) in the item of e-learning enabled me to complete the learning activities more rapidly. However, the greatest mean scores were found in the e-learning is simple to utilize domain. The item of e-learning lowered student's educational cost received the highest mean scores (3.51 ± 0.02 , 3.44 ± 0.06 & 3.43 ± 0.01 respectively) among the third, second and fourth years. The highest mean scores (3.21 ± 1.02 , 3.20 ± 1.00 and 3.19 ± 0.93 respectively) among the second, fourth and third years were in the item "I am interested in studying courses that use e-learning," while the lowest mean scores (1.26 ± 0.91 & 1.72 ± 1.05 respectively) among the first and second years were in the item "I enjoy using an e-learning system on my course."

Figure 1 shows that students in the first, fourth, second and third academic years expressed negative attitudes regarding e-learning (74.1%, 61.1%, 53.2% and 47.1%). While in the third, second, fourth and first academic years, 52.9 %, 46.8%, 35.9% and 25.9% of them had positive attitudes regarding e-learning respectively.

Table 3: Mean e-learning domain scores and overall attitude score toward e-learning as indicated by nursing students. According to the table, students perceive the only positive attitude to be the highest mean score for total attitude (49.88 ± 10.99) for the third academic year. The first academic (39.12 ± 7.64) had the lowest mean score among the students studied. The academic years of the students and their attitudes toward e-learning differed statistically significantly. In addition, the table showed that all nursing students from all academic years had a low mean score in the e-learning is simple to utilize domain's. Aside from that, third and second year students had the greatest mean scores (22.98 ± 4.97 & 20.11 ± 4.26) in the e-learning usefulness domain, while third year students had the highest mean score (17.21 ± 3.12) in the e-learning behavioral intension domain.

Figure 2 shows that; 55.5% of the students' studied had overall negative attitudes toward e-learning, whereas 44.5 % had overall good attitudes toward it.

Table 4a shows that; 60.4 % of the studied students agreed/strongly agreed that there was a lack of suitable knowledge and expertise in the usage of e-learning when it came to e-learning obstacles related to students' characteristics. However, regarding elements relating to technical and managerial assistance, 87 % of the students agreed/strongly agreed that the slowness of the network

was an obstacle to their online learning. In terms of items related to infrastructure and technological advancements, 92.2 % of the studied students agreed/strongly agreed that there was a lack of bandwidth connections with frequent outages.

Table 4b shows that; according to e-learning obstacles in the curriculum material dimension, 75% of the students agreed/ strongly agreed that it was difficult to understand the contents of the subject through e-learning and that concerns about the practical nature of some courses were not offered electronically. Related to the items connected to the dimension of instructors' characteristics, (88.7% and 88.0%) of the students agreed/strongly agreed that it was difficult to contact academic staff when they were at home, and that my lecturers preferred traditional teaching and research methods respectively.

Table 5 shows that there were statistically significant differences in academic years and e-learning obstacles among the studied students. In addition, all of the studied students from all academic years had the highest mean scores related to technical and managerial assistance obstacles, infrastructure and technological advancements obstacles and instructors' characteristics obstacles, as shown in the table. Otherwise, fourth-year students had the lowest mean score (23.11 ± 4.72) for curriculum material obstacles, while third and second year students had the lowest mean scores (18.32 ± 3.14 & 19.3 ± 3.88 respectively) for the students' characteristics obstacles.

Figure 3 shows that; in the first year, the highest percentage of total obstacles presented among the studied academic students was (66.8%), while in the fourth year, the lowest percentage of total obstacles presented among the studied academic students was (57 %).

Figure 4: The most common obstacles of e-learning were infrastructure and technological advancements, technical and managerial assistance and instructors' characteristics (88.2%, 86.3% and 83.3% respectively), while the least common obstacles were curriculum material and students' characteristics (67.5% and 63.5% respectively).

Table 6 shows that there was a statistically significant negative correlation between the total score of attitudes toward e-learning and the scores of five dimensions of e-learning obstacles and that the curriculum material and instructors' characteristics obstacles had a significant positive correlation. In terms of e-learning obstacles, there was also a highly significant positive correlation between technical and managerial assistance, as well as infrastructure and technological advancements.

Table 7 shows that the majority of the students had negative attitudes toward e-learning, regardless of their age, sex, residence, marital status, academic years, devices for e-learning activities, internet access at home, or previous computer experience. It also demonstrates that there was no statistically significant difference in other demographic characteristics except residence, marital status and access to the internet at home. In addition, the table showed that the biggest percentages of the students' studied had encountered e-learning obstacles when implementing it in terms of age, sex, residence, marital status, academic years, devices for e-learning activities, internet access at home and previous computer experiences. There were no statistically significant differences in the demographic characteristics of the studied students, such as residence, marital status, academic years, internet access at home and computer experiences and obstacles, but statistically significant differences in age, sex variables, and devices to be used in e-learning activities.

Table 1. Demographic characteristics of the studied students (n= 614).

Demographic characteristics	Students (n= 614)	
	No.	%
Age /years:		
≤ 20	330	53.7
21-22	173	28.2
≥ 23	111	18.1
Mean±SD	18.42 ± 1.37	
Sex:		
Male	254	41.3
Female	360	58.7
Residence:		
Rural	424	69.0
Urban	190	31.0
Marital status:		
Married	26	4.2
Single	588	95.8
Academic years:		
The First year	193	31.4
The Second year	171	27.8
The Third year	136	22.2
The Fourth year	114	18.6
Devices for e-learning activities:		
Computer	81	13
Laptop	58	9.2
Mobile	402	64.1
Tablet	26	4.1
No device	60	9.6
Internet facility at home:		
Yes	369	60.1
No	245	39.9
Computer use (years):		

<5	290	47.3
≥5	324	52.7

Table 2. The mean score of the students' attitudes about e-learning items. (n=614).

Electronic learning items	Academic years Mean± SD			
	1 st year 772 (n= 193)	2 nd year 685 (n= 171)	3 rd year 543 (n= 136)	4 th year 459(n= 114)
E-learning usefulness				
1. The contents of e-learning are informative.	1.18±0.28	1.68±0.77	2.14±0.80	1.42±0.26
2. The learning efficiency is improved because e-learning.	1.47±1.04	1.96±1.22	2.19±1.23	1.71±1.06
3. E-Learning motivates me to look for more knowledge on the subject of learning.	1.09±1.01	2.05±0.15	2.07±0.13	2.01±0.06
4. In offering distance education, e-learning is a beneficial learning tool.	2.40±0.97	2.87±1.00	3.04±0.98	2.94±0.91
5. E-learning helps me succeed in my studies.	2.52±0.33	3.02±0.34	3.13±0.38	2.76±0.31
6. I am able to complete the learning exercises more rapidly because to e-learning.	2.62±0.23	3.12±0.26	3.24±0.30	2.86±0.22
E-learning is simple to utilize				
7. E-learning content comes naturally to me.	1.12±0.72	1.48±0.71	1.62±0.67	1.44±0.65
8. E-learning provides me with all of the materials I require for my studies.	2.23±1.15	2.73±1.22	3.01±1.26	2.47±1.17
9. E-learning allows me to effectively manage my time.	1.30±0.33	1.81±0.61	2.03±0.65	1.55±0.35
10. E-learning facilitates my learning process.	1.10±0.52	1.40±1.04	1.71±0.98	1.42±1.00
11. E-learning lowers the cost of education for students..	2.41±0.61	3.44±0.06	3.51±0.02	3.43±0.01
12. E-learning allows for more flexibility in interacting with friends and students.	1.27±0.73	1.59±0.72	2.76±0.62	1.58±0.67
Behavioral intension				
13. As a teaching method, e-learning is effective.	1.39±0.06	1.73±0.08	1.89±0.09	1.71±0.02
14. In terms of learning, e-learning is preferable to face-to-face instruction.	2.12±0.02	2.01±0.17	2.07±0.13	2.11±0.02
15. For my study, I prefer to use e-books.	1.11±0.90	2.01±0.17	2.11±0.15	2.07±0.08
16. I am interested in taking e-learning courses.	2.11±0.02	3.21±1.02	3.19±0.93	3.20±1.00
17. I advise other students to use an e-learning system.	1.38±0.06	1.81±0.44	1.85±0.43	1.78±0.35
18. On my course, I enjoy using the e-learning system.	1.26±0.91	1.72±1.05	1.74±1.02	1.74±0.96

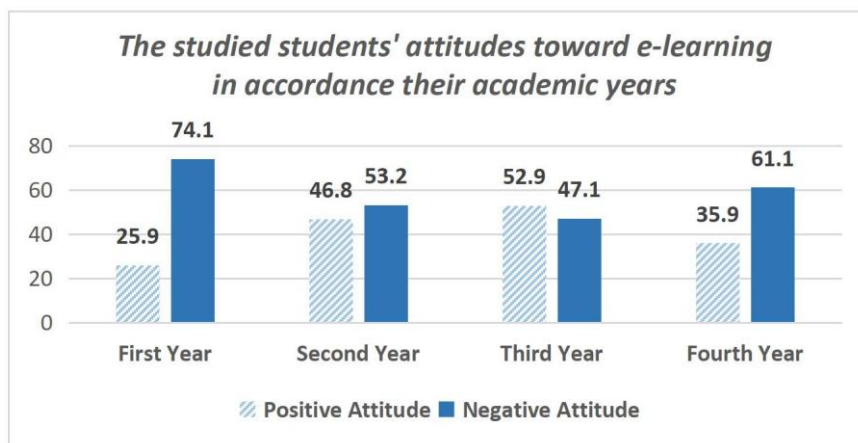


Figure 1. Percentage distribution of the studied students' attitudes toward e-learning in accordance their academic years (n=614).

Table 3. Mean score of e-learning domains and total attitude toward e-learning as reported by the studied students (n=614).

E-learning domains	1 st year (193)	2 nd year (171)	3 rd year (136)	4 th year (114)	Total (614)	Rank	ANOVA	P-value
	Max	Mean± SD	Mean± SD	Mean± SD				
Usefulness of e-learning	28	12.99±3.20	20.11±4.26	22.98±4.97	13.89±3.57	19.12±3.62	1	
E-learning is simple to utilize	25	10.11±3.62	12.63±3.72	12.98±3.47	15.21±3.71	13.53±3.43	3	17.23 0.000**
Behavioral intension	24	12.01±2.73	14.22±3.68	17.21±3.12	10.32±3.32	13.71±2.68	2	
Total score	76	39.12±7.64	43.77±9.97	49.88±10.99	41.33±8.01	51.11±10.12		

(**) P ≤ 0.001 = highly statistically significant.

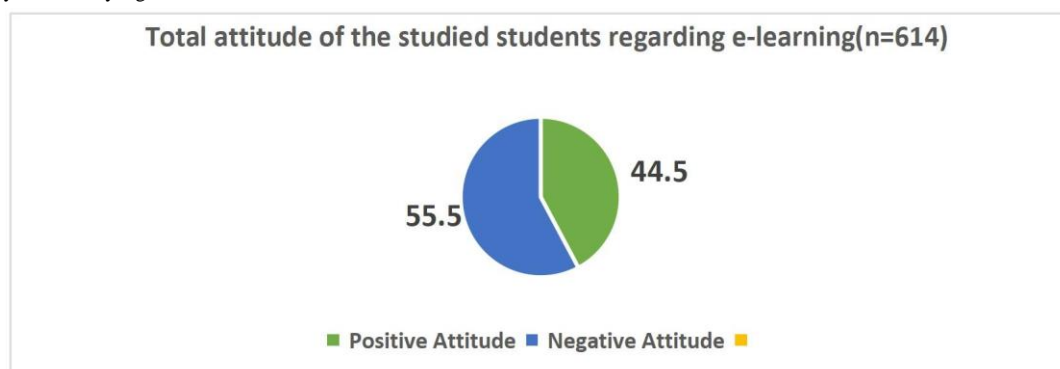


Figure 2. Percentage distribution of the studied students' total attitudes regarding e-learning (n=614)

Table 4a. Percentage distribution of the studied student's perspective regarding e-learning obstacles items (n=614).

E-learning obstacles	++ Disagree / Disagree	Neutral	++Agree / Agree
Dimension of students' characteristics			
1. Insufficient expertise and knowledge in the application of e-learning.	18.2%	21.4%	60.4%
2. There aren't enough devices to employ for e-learning..	69.2%	10.8%	20.0%
3. Learning online might cause a lack of confidence and shyness.	20.3%	30.3%	49.4%
4. There is no access to the internet.	36.4%	6.5%	57.1%
5. Inability to keep up with the speed of the course due to a lack of time management skills.	19.3%	21.8%	58.9%
6. Through the e-learning platform, I was unable to engage with my colleagues.	48.3%	12.1%	39.6%
7. Language and typing abilities are insufficient for online learning.	39.4%	11.3%	49.3%
Dimension of technical and managerial assistance			
8. Having problems with the system and not being able to access the e-learning platform	8.3%	5.7%	86.0%
9. My online learning is hindered by the slowness of the network	4.6%	8.4%	87.0%
10. A lack of assistance, such as tutors	35.1%	4.0%	60.9%
11. The e-learning system is frequently unavailable.	17.3%	12.7%	70.0%
12. There is no technical assistance for using e-learning at the college.	10.3%	3.6%	86.1%
13. The utilization of e-learning is incompatible with university textbooks.	12.1%	18.1%	69.8%
14. There is a lack of professional aid to deal with technological issues.	14.3%	3.7%	82.0%
Dimension of infrastructure and technological advancements			
15. Connections with low bandwidth and frequent outages.	3.1%	4.7%	92.2%
16. Inadequate training prior to using an e-learning platform..	2.1%	6.2%	91.7%
17. Internet fees and charges from private cafés obstruct e-learning.	31.2%	9.0%	59.8%
18. Inadequate guidance while attending e-learning courses.	11.8%	9.1%	79.1%
19. The design of the e-learning system is rigid and difficult to use.	7.4%	4.6%	88.0%
20. My utilization of e-learning resources is hampered by my home's unstable power supply.	32.0%	8.1%	59.9%
21. I'm having trouble understanding the software instructions for using online discussion..	19.5%	10.3%	70.2%

Table 4b. Percentage distribution of the studied student's perspective regarding e-learning obstacles items (n=614).

E-learning obstacles	++ Disagree / Disagree	Neutral	++Agree / Agree
Dimension of curriculum material			
22. The curriculum does not correspond to the e-learning system's learning and teaching resources	57.4%	6.1%	36.5%
23. Difficult to obtain e-resources from the e-platform when at home	41.0%	5.5%	53.5%
24. Difficult to understand the substance of my subject through e-learning.	28.2%	9.5%	62.3%
25. E-learning makes it difficult to comprehend the subject's substance..	17.9%	7.1%	75.0%
26. The mismatch of e-learning and curriculum material	51.2%	3.6%	45.2%
27. Some courses are not delivered electronically due to concerns regarding their practical character.	10.7%	14.3%	75.0%
28. Multimedia tools are used to supplement lecture notes (flash animations, simulations, videos, audios, etc.).	39.6%	23.2%	37.2%
Dimension of instructors' characteristics			
29. Instructors lacked the necessary knowledge and skills to apply e-learning effectively.	16.3%	21.2%	62.5%
30. My teachers are not confident to use e-learning.	29.1%	21.0%	49.9%
31. My teacher's lack of clear instructions.	27.9%	7.1%	65.0%
32. Instructor's inability to provide timely feedback	16.3%	19.0%	64.7%
33. My teachers prefer traditional teaching and research methods..	6.9%	5.1%	88.0%
34. My teacher's slowness in submitting courses online has a negative impact on my grades.	4.9%	16.1%	79.0%
35. It's difficult to get in contact with teaching staff, when at home.	8.2%	3.1%	88.7%

Table 5. Relation between academic years of the studied students and their reported obstacles of e-learning (n=614).

Obstacles' dimensions	Academic years				ANOVA	P- value
	Max 1 st year (n=193)	2 nd year (n=171)	3 rd year (n=136)	4 th year (n=114)		
Students' characteristics	29 26.32±5.11	19.3±3.88	18.32±3.14	20.11±4.11	18.47	0.001**
Technical and managerial assistance	37 29.84±5.42	30.63±5.41	31.12±3.52	25.70±4.51	17.21	0.001**
Infrastructure and technological advancements	34 28.67±3.72	34.42±4.61	30.21±4.52	28.64±2.36	13.81	0.001**
Curriculum material	32 29.64±3.52	26.64±2.31	24.63±2.1	23.11±4.72	15.29	0.001**
Instructors' characteristics	33 30.72±5.45	30.21±2.31	27.98±3.2	25.70±4.51	21.14	0.001**

(** P≤0.001) highly statistically significant.

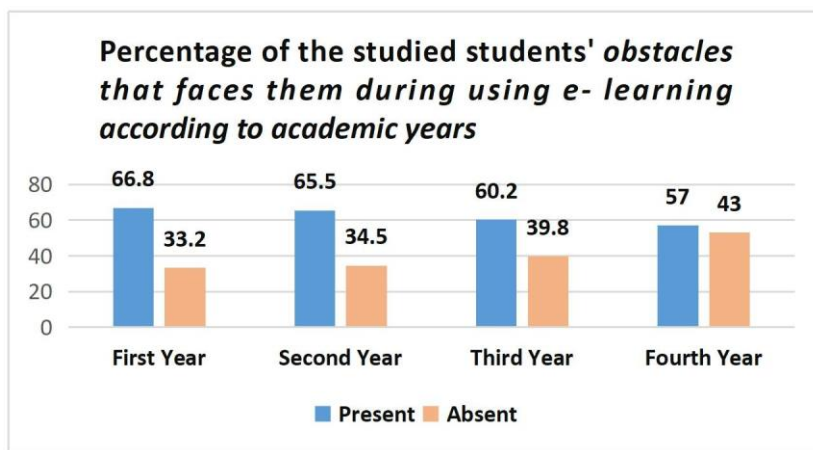


Figure 3. Percentage distribution of the studied students' obstacles that faces them during using e- learning according to academic years (n=614).

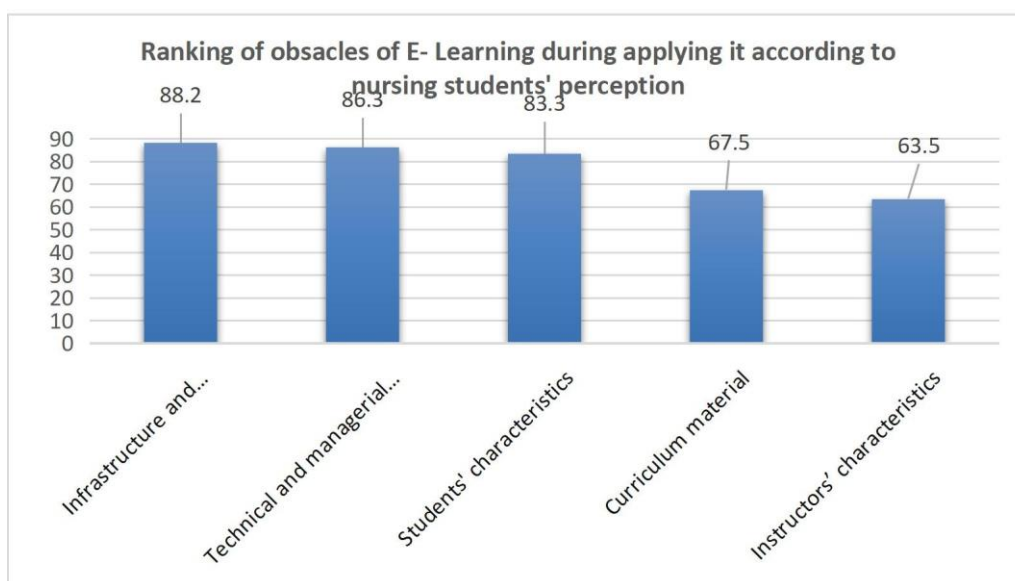


Figure 4. Ranking of obstacles of e- learning during applying it according to the studied students' perception. (n=614).

Table 6. Correlation coefficient (r) between e-learning obstacles dimensions and attitudes towards e-learning among the studied students (n=614).

Variables	Total score of e- learning attitude		Students' characteristics		Technical and managerial assistance		Infrastructure and technological advancements		Curriculum material		Instructors' characteristics	
	r	P	r	P	r	P	r	P	r	P	r	P
Total score of e-learning attitude	1											
Students' characteristics	-0.49	0.000**	1									
Technical and managerial assistance	-0.41	0.01*	0.53	0.062	1							
Infrastructure and technological advancements	-0.55	0.001**	0.57	0.074	0.59	0.001**	1					
Curriculum material	-0.27	0.005*	0.41	0.01*	0.62	0.001**	0.69	0.11	1			
Instructors' characteristics	-0.62	0.000**	0.51	0.001**	0.71	0.07	0.73	0.23	0.88	0.001**	1	

(*) Statistically significant at p<0.05 (**) highly statistically significant at p≤ 0.001

Table 7. Relation between the studied students' demographics characteristics, obstacles faced and their attitudes toward e-learning (n=614).

Demographic characteristics	Overall attitude toward e-learning				X ²	P value	E- learning obstacles				X ²	P value
	Positive (no =273(Negative (no=341(Present (no =372(Absent (no =242(
	No	%	No	%			No	%	No	%		
Age (years):												
≤ 20	129	39.1	201	60.9			229	69.4	101	30.6		
21-22	100	57.8	73	42.2	7.92	0.001**	104	60.1	69	39.9	13.9	0.001**
≥ 23	72	64.8	39	35.2			64	57.6	47	42.4		
Sex:												
Male	142	55.9	112	44.1			153	60.2	101	39.8		
Female	153	42.5	207	47.5	6.09	0.001**	232	64.4	128	35.6	5.82	0.01*
Residence:												
Rural	142	33.5	282	66.5			293	69.1	171	40.3		
Urban	69	36.3	121	63.7	2.6	0.10	115	60.5	75	39.5	2.1	0.16
Marital status:												
Married	9	34.5	17	65.3			19	73.1	7	26.9		
Single	223	37.9	365	62.1	2.3	0.14	380	64.6	208	35.4	2.8	0.11
Academic years:												
The First year	61	31.6	132	68.4			139	72.0	54	28.0		
The Second year	89	52.0	82	48.0	16.1	0.001**	119	69.6	52	30.4	5.91	.061
The Third year	66	48.5	70	51.5			77	56.6	59	43.4		
The Fourth year	39	34.2	75	65.8			76	66.7	38	33.3		
Devices for e-learning activities:												
Computer	39	48.1	42	51.9			49	60.5	32	39.5		
Laptop	30	51.7	28	48.3			38	65.5	20	34.5		
Mobile	192	47.8	210	52.8	15.8	0.001**	241	60.0	159	40.0	6.9	0.009*
Tablet	10	38.5	16	61.5			17	65.4	9	34.6		
No device	9	15.0	51	85.0			39	65.0	21	35.0		
Internet facility at home:												
Yes	200	54.2	169	54.8	6.13	0.062	140	37.9	229	62.1	2.7	0.12
No	75	30.6	170	69.4			146	59.6	94	38.4		
Computer use (years):												
< 5	79	27.2	211	72.8	7.81	0.001**	170	58.6	120	41.2	2.1	0.16
≥ 5	186	57.4	138	42.6			196	60.5	128	39.5		

4. Discussion:

The COVID-19 pandemic has challenged the educational systems worldwide and, in an attempt, to overcome such challenges, educational institutions were forced to adjust their educational content from the traditional methods of learning to online methods of delivery instead. Online learning shifts education from a conventional traditional classroom that is teacher centered to a student-centered one, where students are more responsible for their learning. The sudden transition to online learning has become a measure of organizational resilience, where most academic institutions merely concentrated on moving the educational content to the digital world rather than focusing on the online teaching and delivery methods. This rapid transformation is linked to various obstacles and challenges at this point. But because nobody knows when this pandemic will disappear fully, educational institutions across the globe decided to use the already available technical resources to create online learning material for students of all academic fields (Kaoud et al., 2021).

The aim of this study was to assess the effect of obstacles faced nursing students related applying e-learning during COVID-19 pandemic on their attitudes.

Prior to discussing the findings in relation to the study questions, it should be noted that the demographic characteristics of the studied sample, as shown in table (1), revealed that: More than half of the studied students were females, with the mean \pm SD was 18.42 ± 1.37 and the majority of them were singles; more than two thirds of them lived in rural areas, less than one third of them were in the first year, less than two thirds of them had devices for their e-learning activities as mobile, more than half of them had internet facility at home and had experienced for using a computer for five years and above. These findings were supported by the study done by Joshi, (2021), who found that more than half of their respondents were female students, the majority of them aged ≤ 19 years old, less than one third of them were in the second and third years and less than two thirds of them used smart phone with internet for e- learning.

These findings disagreed with the study done by **Gaur et al., (2020)**, who reported that; less than half of their participants were in the age group of 19-21 with the mean age was 20.49 ± 1.88 years and most of them belonged to rural community and all of their participants (100%) rated their level of computer knowledge at average level.

The present study found that the highest mean scores (3.13 ± 0.38 & 3.02 ± 0.34 respectively) among the third and second year students were in the item of e-learning helped me succeed in my studies and the highest mean scores (3.24 ± 0.30 & 3.12 ± 0.26 respectively) were in the item of e-learning enabled me to complete the learning exercises more rapidly (table 2). These findings disagreed with the study done by **Khan et al., (2017)**, who indicated that their studied students extensively accepted m-learning (mobile learning) because wireless networks let them to seek for, obtain and work independently on learning materials and resources in a short period of time, whereas online learning is time-consuming and challenging.

According to the results of the current study, over three quarters of the studied students in the first year had a negative attitude toward e-learning, while more than half of them in the third year had a positive attitude toward e-learning (figure 1). This might be because the first-year students are new to college and have no experience in the using of internet during their school years before, but the third academic students might be used e-learning in teaching from previous years in their faculty and became more familiar to the technology during their courses.

According to the mean scores of e-learning domains and overall students' attitudes toward e-learning, the e-learning usefulness domain had the highest mean scores, followed by the behavioral intention domain and then the e-learning is simple to utilize domain as indicated by the students. Furthermore, the current study discovered that students in their third and second years had the highest mean ratings in the e-learning usefulness domain, respectively. Otherwise, e-learning is simple to utilize domain got a poor mean score in all studied students of all academic years. Furthermore, third-year students got the highest mean score in the e-learning behavioral intention domain. There were statistically significant differences in all of the e-learning domains among the studied students (table 3). This might be because students believe that e-learning can help them improve their academic skills, and the availability of distance education is a crucial element impacting their general attitude toward e-learning. Furthermore, almost all of the

students' studied had a low average score for the e-learning is simple to utilize due to lack of technical assistance for students to deal with technological issues and the difficulty of using e-learning because it is a new experience for them, particularly for first-year students. Students' attitudes toward e-learning will improve if they believe the e-learning system is simple to use and useful. These findings were supported by the study done by **Salloum et al., (2019)**, who found that the ease and user-friendliness of e-learning systems will influence students' acceptance and willingness to use them.

In terms of the total attitudes of the studied students toward e-learning, the current study found that more than half of the students had total negative attitudes toward e-learning and less than half of them had total positive attitudes toward e-learning (figure 2). This might be due to most of the studied students were in the first academic year and didn't have a background about e-learning activities. This finding was inconsistent with the study done by **Thapa et al., (2021)**, who revealed that more than half of their students (58.9%) had a total positive attitude toward e-learning, whereas 41.14 % had a total negative attitude toward e-learning.

In terms of the perspectives of the studied students on e-learning obstacles, the findings revealed that more than half of the students strongly agreed that a lack of sufficient knowledge and skills in the use of e-learning was the most common obstacle in terms of students' characteristics obstacles that may hinder e-learning (table 4a). This might be because students require assistance in developing their abilities in order to participate effectively in e-learning possibilities, and students' prior experiences may influence their use of technology in their learning. This finding was in the same line with the study done by **Rouleau et al., (2019)**, who reported that lack of IT (Information Technology) skills and reluctance to use e-learning among the academics and students were cited as the major barriers in implementing e-learning. But, this finding was on the contrary with the study done by **Abd El-Hamed & Elgahsh, (2020)**, who reported that more than two thirds of their participants (68.6%); the absence of proper knowledge and skills in the application of e-learning was concurred to be the most common obstacle in regards of learner characteristics.

Also, regarding technical and managerial assistance obstacles, the results of the current study illustrated that most of the studied students strongly agreed that the slowness of network was an obstacle to the learning online, the college didn't provide technical assistance for using e-learning and faced problems with the system and

lack of access to the e-learning platform respectively were the most common obstacles that hinder e-learning process (table 4a). These findings were alignment with the study done by **Al-Balas et al., (2020)**, who reported that technical, institutional and student related barriers was found to be the three main challenges in the implementation of e-learning. Lack of internet access, infrastructure and poor internet quality are the examples of such barriers that affect the e-learning. And, with the study conducted in Iraq by **Al-Azawei et al., (2017)**, who found that lack of technical support was identified as one of the barriers to e-learning.

Pertaining to infrastructure and technological advancements obstacles, the results of the present study revealed that; most of the studied students strongly agreed that the most common obstacles that hinder the e-learning process were poor bandwidth connections with frequent outages and insufficient training prior to using an e-learning platform, respectively (table 4a). This might be because all of these are considerable obstacles to effective e-learning implementation and strategic direction is a key aspect of the institutional framework that encourages students to accept e-learning and improves the learning system's performance. This finding was in the same line with the study done by **Obi et al., (2018)**, who reported that students living in rural areas had poor internet bandwidth and less availability of computers at their home place, which leads to unfavorable attitude towards online classes. Computers and internet speed are the basic requirements for online learning and the unfamiliarity of students with the technology leads to that the students didn't have frequent experience of online access. Also, this finding disagreed with the study carried out by **Shahmoradi et al., (2018)**, who discovered that access to technology and slow internet connectivity were major barriers to successful e-learning implementation for 40% of their participants.

In terms of curriculum material obstacles, the current study found that three quarters of the students strongly agreed that it was difficult to understand the contents of the subject through e-learning and that some courses were not offered electronically due to practical considerations, respectively (table 4b). This might be due to some subjects need that the learner and instructor should meet face to face as the practical side and the faculty of nursing was a practical college. This finding was in the same line with the findings of a study conducted by **Koi- Akrofi et al., (2020)**, who reported that content concerns are one of the most significant challenges in online learning and that they are divided into two categories: A lack of content and a lack of understanding of the content.

In terms of obstacles presented by instructors' characteristics, the findings of this study revealed that most of the studied students strongly agreed that it was difficult to get in contact with teaching staff when they were at home, and that my teachers prefer traditional teaching and research methods (table 4b). This might be due to this method of teaching was more effective than distance education where the student and the instructor interact with each other than the other method and the instructors were the experts of the students' content and facilitators of delivery of the curriculum and the course, delivering criticism and grades and observing, judging and managing in the students' learning as well as constructing a learning group in which students feel secured and trust that their offerings are effective. As a result, instructors who do not use e-learning systems will have an impact on students' attitudes against using e-learning and any obstacle in the instructor's character will prohibit students from effectively using e-learning. This finding was in the same line with the study done by **Khan et al., (2021)**, who reported that Covid-19 pandemic being contagious in nature and required control and isolation that affecting teachers- students' personal interaction. Also, this finding was alignment with the study done by **Wahid et al., (2018)**, who reported that instructor could play an important role in helping student to achieve educational objectives through instructors who are highly active using e-learning system by providing fast response, motivation support, suggestion and assessment can positively increase student satisfaction and the study done by **Hoq (2020)**, who found that unavailability of instructors and support staff would provide a big obstacle in ensuring a sufficient number of productive workers (i.e. academic and support staff). Institutions must have enough staff to maintain a good grade of e-learning program. To keep up with the ever-changing conditions of e-learning, it's critical to have enough support staff.

According to relation between academic years of the studied students and obstacles of e-learning as reported by them, the results of the current study showed that there were statistically significant differences between the studied students' academic years and their e-learning obstacles (table 5). This might be related to learners' and instructors' access to contact information. Confirming students' technological proficiency, as well as considering the various degrees of their capacities in instructor-student interaction in an e-learning environment, are all important. Furthermore, success in implementing an e-learning system to manage higher education institutions' knowledge and educational demands cannot be achieved without first understanding the technological, cultural and skills obstacles of e-learning. To meet these problems, it will be required to

develop technological infrastructure and standards, as well as to draw on the experiences of developed countries in the field of e-learning. This finding disagreed with the study done by **Shahmoradi et al., (2018)**, who reported that; there was no significant difference in the difficulty of using an e-learning system across academic years.

Concerning to the studied students' obstacles that faces them according to academic years when using e-learning, the results of the present study cleared that the first-year academic studied students had the highest percentage of total presented obstacles (nearly two thirds) and the fourth-year academic studied students had the lowest percentage of total presented obstacles (more than half) (figure 3). From the perspective of the researchers, the students in the first year didn't know barriers and obstacles that might face them as they were new in the college but the students in the fourth year were actually face a lot of challenges during the previous academic years to overcome the obstacles of e-learning and online instruction, all members of the "university village" must play a role and collaborate. For example, having a willing and hardworking online faculty is insufficient if the institution's e-learning infrastructure is lacking. This finding was supported by the study done by **Martha et al., (2021)**, who discovered that first-year students require more attention in the communication process, as well as appropriate teaching resources. Second- and third-year students require further e-learning training, whereas fourth-year students are more capable of adapting to e-learning components and challenges.

As regards to a ranking of e-learning obstacles encountered when implementing it, the majority of the studied students ranked infrastructure and technological advancements, technical and managerial assistance and instructors' characteristics as the most common obstacles that they face during the implementation of e-learning, while nearly two thirds of them ranked curriculum material and students' characteristics as the least common obstacles. (figure 4). These results were congruent with the study done by **Abd El-Hamed & Elgahsh, (2020)**, who reported that infrastructure and technology, technical and managerial support, and instructors' characteristics were the most common difficulties mentioned by their nursing students, while curriculum content and learners' characteristics dimension were the least common. Also, supported by the study done by **Zalat et al., (2021)**, who found that insufficient/ unstable internet connectivity, inadequate computer labs, lack of computers/ laptops and technical problems were the highest challenge for adapting to e-learning and alignment with the study done by **Nguyen et al., (2020)**, who demonstrated that the main obstacles

to e-learning are based on several stakeholder perspectives of infrastructure, technology, management, support, execution, and pedagogical aspects.

In terms of correlation between the total attitude score of the studied students toward e-learning and the scores of each of the five dimensions of e-learning obstacles, the current study found that there was a statistically significant negative correlation between the total attitude score of the studied students toward e-learning and the scores of each of five dimensions of e-learning obstacles (table 6). The finding was supported by **Yekefallah et al., (2021)**, who reported that, satisfaction is a crucial aspect and an important predictor of educational quality. Structure, flexibility, teacher experiences and support, motivation, and communication are all aspects that influence e-learning satisfaction. Also agreed with the study done by **Pourtavakoli et al., (2021)**, who stated that regarding the learners, there are some important factors that affect learners' satisfaction such as the learners' attitude toward the computer, the learners' anxiety about the computer and the learners' self-efficacy. About the instructor, factors such as their attitude towards e-learning and the amount of response to learners; about the educational materials, flexibility and quality of the contents; in the technology domain, technology quality and internet; in the field of design, usefulness and ease of use; and finally, regarding the learning environment, diversity and the extent of learners' interaction with others were suggested effective on learners' satisfaction. Also was congruent with the study done by **Ahmed et al., (2018)**, who found that the most critical success factors that may enhance the sustainability and performance in e-learning are organizational infrastructure readiness, efficient technology infrastructure, appropriate e-learning course design, course flexibility, understandable relevant content, stakeholders' training, security, access control and privileges, commitment and being user-friendly and well-organized.

The present study also demonstrated that; students' characteristics had a significant positive correlation with the curriculum material and instructors' characteristics obstacles (table 6). This might be due to if the learners and instructors had a sufficient knowledge and skills on how to use e-learning system, this would lead to not difficulty to the learners to understand the contents of the subjects through e-learning and for to the instructor not difficulty to contact with academic staff when at home. This finding was in the same line with the study done by **Almaiah & Alyoussef, (2019)**, who revealed that the most critical barriers that influence the successful implementation of e-learning at Saudi Arabian universities could be classified into four main

dimensions namely: Students' dimension, instructors' dimension, infrastructure and technology dimension and institutional management dimension. In the same context, the finding was alignment with **Mtebe & Raphael, (2018)**, who stated that instructor quality has been discovered to have a considerable beneficial effect on learners' satisfaction with an e-learning system. and the study done by **Ghazal et al., (2018)**, who identified that the effect of instructor characteristics on students' usage and acceptance of e-learning was very important where the course content quality and course design factors significantly contribute to the success of e-learning systems' acceptance and usage and the study done by **Aldowah et al., (2019)**, who reported that course characteristics (course design and course content) might play a key role in shaping the learning process and consequently, motivate students to use and accept an e-learning system.

Also, the current study showed that; in terms of e-learning obstacles, there was a highly significant positive correlation between technical and managerial assistance and infrastructure and technological advancements dimensions regarding e-learning obstacles (table 6). This result agreed with the study done by **Alshehri et al., (2019)**, who indicated that facilitating conditions in terms of the availability of hardware, software resources and internet connection and technical support significantly influence the behavioral intention to use learning management system. In the same context, the finding was alignment with **Naveed et al., (2017)**, who showed that students' dimension, instructor's dimension, design and content's dimension, system and technological dimension and institutional management dimension were the most critical factors for ensuring the successful implementation of e-learning in Saudi Arabian universities.

In terms of the relationship between the studied students' demographic characteristics and the obstacles they faced while using e-learning, the results of the current study revealed that there were no statistically significant differences between the studied students' demographic characteristics such as residence, marital status, academic years, internet facility at home, and experiences in using a computer and the obstacles they faced (table 7). These findings disagreed with the study done by **Kutah, (2021)**, who revealed that in regards to gender characteristics, there are no statistically significant differences in the e-learning education problems faced by nursing students in Jordanian universities.

In regards to the relationship between the demographic characteristics of the studied students and their attitudes

toward e-learning, the current study found that there was a highly statistically significant difference in all demographic characteristics of the studied students except residence, marital status, and home internet access (table 7). These findings were in contrast with the study done by **Thapa et al., (2021)**, who reported that there was no significant association of overall attitude of their participants regarding e-learning with socio-demographic variables as age and year of study but agreed with the study done by **Bali & Liu, (2018)**, who demonstrated that there was no association between their participants' attitude regarding e-learning and residence and was in the same line with the study done by **Al Gamdi & Samarji, (2017)**, who claimed that age is believed to be one of the demographic variables that tends to shape learners' perceptions of e-learning and is an important independent variable affecting faculty members' perceptions of e-learning, and that gender is also a factor that is believed to have an influence on faculty member attitudes towards e-learning where female faculty members are believed to have a positive attitude towards e-learning. And the study done by **Martha et al., (2021)**, who reported that, there was a significant difference in their students' e-learning perceptions and readings based on their academic years at university and gender.

5. Conclusion & recommendations:

In the light of this study findings. It can conclude that; infrastructure and technological advancements were the most frequent obstacles faced by nursing students, followed by technical and managerial assistance and instructors' characteristics. There was a statistically significant negative correlation between nursing students' attitudes toward e-learning and the obstacles they face. Finally, except for residence and marital status, there was a statistically significant difference between nursing students' attitudes and all other demographic characteristics. Except age, sex variables, and the devices to be utilized in conducting e-learning activities, there was no statistically significant difference between other students' demographic variables and the obstacles they faced. Following a discussion of the findings, the study suggests that higher education institutions use an E-learning method to improve students' academic progress while taking into account the unique qualities of each program. It also suggests that more research be done on the elements that influence E-learning, whether they are connected to students, lecturers, or infrastructure, as these aspects have a significant part in enhancing the university's and students' performance.

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