

Effectiveness of a psycho-educational program on perception and obstacles regarding electronic learning among nursing students

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ABSTRACT

Background: Nowadays, electronic learning (e-learning) is necessary for organizations to support their learning activities. Besides, integrating e-learning into learning and teaching may be challenging with several hurdles. Therefore, a psycho-educational program is necessary for nursing students to improve their perception and overcome obstacles regarding electronic learning, thus, improving their learning experience. **Objective:** The study aims to evaluate the effectiveness of the psycho-educational program on perceptions and obstacles regarding electronic learning among nursing students. **Design:** This study used a quasi-experimental design, pretest-posttests; 341 students were chosen randomly from four academic years, at Assiut University's Faculty of Nursing, during the 2021-2022 academic year. **Methods:** Students were chosen randomly and given the psycho-educational program. Data were collected via student perceptions of electronic learning questionnaires and obstacles to electronic learning questionnaires before and after the program intervention. **Results:** This study showed an improvement in positive perception as the percentage was 90.3% compared to 56.9% before implementing the program, and negative perception decreased from 43.1% to 9.7% with $p < 0.001$). The mean difference was 13.07 (95% CIs: 11.364 - 14.782). This study revealed a reduction in obstacles regarding e-learning which in the pre-program, reported the presence of obstacles regarding technical and administrative support, infrastructure and technology, and curriculum content dimension with 78.9%, 74.5%, and 70.4%, respectively. While, in the post-program, obstacles regarding the same subdimension of obstacles were reported at 34.6%, 34.6%, and 28.7% respectively, the mean differences were -7.29, -6.85, and -6.41 (95% CIs : -8.292 to -6.294, -7.821 to -5.874, and -7.326 to -5.525), respectively. **Conclusion:** The psycho-educational program improved perception and reduced nursing students' obstacles to electronic learning. **Recommendation:** This study might serve as a guide for future studies delving into reasons for success that contribute to the positive viewpoint regarding e-learning systems.

Key words:

perception; obstacles; e-learning; psycho-educational program.

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INTRODUCTION

E-learning is becoming more important in academia and corporate training. It can potentially become one of the most significant advancements and uses in information technologies (ITs) ¹. E-learning refers to any educational activities carried out by people or groups using stand-alone or networked computers and other electronic devices, whether conducted synchronously or asynchronously online or offline ². For universities and lecturers, as well as students, because of its adaptability in offering education with a low-cost alternative that is accessible at any time and from any place, e-learning has become an essential educational tool ³.

The adoption of electronic learning by the Higher Education Ministry would be a positive step towards ensuring the continued education of nursing students during the COVID-19 pandemic⁴, especially during the implementation of strict social distancing measures to prevent the spread of the virus, which includes the complete closure of several institutions and universities⁵. Thus, all educational institutions, including nursing schools, have embraced electronic learning to ensure the seamless continuation of the teaching process⁶.

Nursing is a highly specialized career with precise requirements for students⁷, as technology increasingly drives education and nursing. It is vital to comprehend the relationship between learning theories and technologies ⁸. Based on the technology acceptance model (TAM), the performance expectancy of utilizing platform features and the user satisfaction with such tools impact the willingness to adopt e-learning networks⁹. In this respect, Gokuladas and Sam¹⁰ reported that students' attitudes toward accepting technology are influenced by their perceptions of technology's utility and

ease of use. According to Odit-Dookhan ¹¹, it was found that ease of use is a critical factor in determining student satisfaction with e-learning systems. If students find the system easy to navigate and understand, they are more likely to engage with the material and feel motivated to learn.

Overall, considering the nursing students' perception of electronic learning and addressing any obstacles they may face can significantly enhance their educational experience and outcome and contribute to the continued advancement of electronic learning in the field of nursing education. In this respect, Abbasi et al. ¹³ conducted a study about students' perceptions regarding e-learning and revealed that most scholars had negative perceptions. Moreover, Rana et al. ¹⁴ surveyed a sample of college students and found that 48% of participants reported having a negative perception of virtual learning.

E-learning relies heavily on technology, and technical problems can be a significant barrier to integration. These issues include unreliable internet connections, outdated software, and compatibility issues¹⁵.

In the Middle East, countries such as Syria and Saudi Arabia face hurdles to online learning, including poor internet availability, limited public acceptance of virtual learning, and a paucity of online educational materials¹⁶. Organizational hurdles to virtual learning achievement include a lack of understanding regarding online education, trends in online courses, management commitment to distance classes, student registration, and teacher qualifications¹⁷.

Moreover, Mohamed and Fouad¹⁸ found that the highest hurdles in the electronic learning dimensions are technical and administrative support, infrastructure, and technology. In addition, Abdelrazek and Abdallah¹⁹ reported that infrastructure and technology improvements,

technical and administrative help, and teaching qualities were the most common electronic learning hurdles.

Furthermore, Zalat et al.²⁰ found that the most challenging obstacles to adjusting to e-learning were inadequate or unstable internet access, insufficient computer laboratories, deficient computers or laptops, and technical issues. Similarly, Ali et al.²¹ found that technical obstacles, such as a lack of technical assistance, inefficient computer systems, and network concerns, are significant hurdles to online learning.

Based on the recent review, most studies have focused on assessing the students' perception of and obstacles to e-learning. However, there is limited research into educational interventions for students to deal with the associated problems in e-learning. Consequently, the present study evaluated the effectiveness of a psycho-educational program on perceptions and obstacles regarding electronic learning among nursing students.

Hypotheses

There will be a valuable improvement in nursing students' perceptions and a reduction in obstacles related to e-learning after implementing a psycho-educational program.

METHODS

Design, setting, and participants

This study used a pretest-posttest design, and was conducted at the Faculty of Nursing-Assiut University. The participants were 341 students from four academic years. The sample size was determined using the Epi Info software version 3.0, a commonly used tool for calculating sample sizes in research. With a confidence level of 95% and a population size of 2982 students, stratified sampling was used where the population has diverse subgroups (different academic years).

Inclusion criteria

Nursing undergraduates who volunteered to participate in the study and engage in online learning were eligible.

Measurements

1. Students' demographic characteristics: the researcher created it and includes age, gender, academic years, computer courses taken, devices utilized for electronic learning, internet access at home, and preferred learning style.

2. Perceptions of students towards electronic learning questionnaire: The questionnaire was developed by Khan et al.²² (14 items) and used a 5-point Likert scale, ranging from strongly disagree, to strongly agree from 1 to 5. The items were designed to assess students' perceptions of e-learning in four sub-domains: perceived usefulness of e-learning, perceived self-efficacy of using e-learning, perceived ease of use of e-learning and behavioral intention of using e-learning.

The scores were calculated for 14 items, ranging from 14-70, which were computed to yield mean scores for sub-domains and an overall score. Subsequently, these scores were converted into percentages, allowing for a clear distinction between positive and negative perceptions toward e-learning, with a cut-off score of 42, representing the threshold of 60%. Scores of 60% and more were considered positive perceptions, while those of less than 60% were considered negative perceptions¹⁸.

Validity and reliability

The validity of this instrument was established by five specialists from Assiut University's nursing and medical faculties, who confirmed the accuracy and relevancy of the material. The Cronbach alpha coefficient test was used to determine its reliability, which was 0.84.

Obstacles to the electronic learning questionnaire

This tool was developed by Mohamed and Fouad¹⁸ to measure obstacles experienced by nursing students while utilizing the electronic learning system. It consists of 35 questions. It is separated into five dimensions: learner characteristics, technical and administrative support, infrastructure and technology, curriculum content, and instructor characteristics.

Scoring system

The responses of the respondents were assessed on a five-point Likert scale ranging from "1" (strongly disagree) to "5" (strongly agree). A score of 60% or higher indicates the presence of obstacles; a score of less than 60% means the absence of obstacles. The scale revealed a coefficient of reliability (Cronbach's alpha = 0.85).

The procedure of the program

Stage 1: The preliminary stage

To prepare for the intervention and increase a complete understanding of all elements of the study subject, the researchers examined current, past, local, and worldwide relevant literature. The study was formally allowed once the dean of Assiut University's Faculty of Nursing submitted a letter of permission.

Stage 2: Recruitment and group assignment

The students were communicated via in-class advertisements. The researchers initiated the study by selecting a sample of students. The researchers presented themselves to the students and interviewed each group of students to explain the steps of the research and its objectives. The number of students was 341. They were divided into nine groups. Each group consisted of 36-47 students (six groups with 37 participants, two groups of thirty-six students, and one group of forty-seven students). Each group received seven sessions; one session per week. Each

session took about an hour. The researchers communicated with those subjects by mobile phone and created group schedules for each group to inform them about the time of each session in the program.

Stage 3: Pre-test evaluation

The students were required to complete study tools, which took around thirty to forty minutes. The data were analyzed in order to prepare for the intervention sessions.

Stage 4: The planning phase

Following a review of pertinent literature, the researcher developed the contents of the psycho-educational program booklet according to the study goals and then identified students' needs in addition to the data obtained from the assessment phase. The identified needs were translated into intervention objectives and targets, which were then included in a booklet. Students were given the booklet as a self-study guideline.

Phases of implementation

Students received the intervention in seven sessions, one per week for each group. Each session has its own objectives and title based on its content. Each session lasted 45 to 60 minutes, and all students were taught the same materials using the same methods, such as talks, videos, and the booklet. The intervention was implemented from October 2021 to the end of December 2021. At the beginning of each session, a recap of what was covered in the prior session was offered. Throughout the lessons, motivation and reinforcement strategies, such as praise were used to foster learning and active participation.

The sessions were as follows:

- 1st session (45-60 minutes): In this session, the researchers gave an overview of the educational program, the goal of the program, the content of sessions, the time of each session, the advantages of implementing it, and the meeting

places and timings for each group. The data collection tools were then used to conduct the pre-test.

- 2nd session: The researcher discussed the concept of e-learning, as well as the types, reasons for moving towards electronic learning, benefits of electronic learning, and obstacles to e-learning during this session.
- 3rd session: After reviewing the preceding session, the researcher provided knowledge about the necessary skills to deal with courses of e-learning as well as how to use an e-learning platform such as "Moodle" through a simplified explanation. Video modeling and practice were used to provide the course. In conjunction with the students, a homework assignment was developed to allow them to practice these skills regularly until the next session.
- 4th session: Throughout this session, students were taught various relaxation techniques (deep breathing exercises, progressive muscle relaxation, and meditation exercises), explaining their significance and applying the steps many times throughout the session, ensuring that participants understood the relaxation techniques (demonstration and re-demonstration). After that, a homework assignment was developed to allow them to practice these abilities regularly till the next session.
- 5th session: Students were instructed to present a recap of the preceding abilities, comprehend their experience,

and respond to the previous session.

- 6th session: During this session, instructions for maintaining a healthy posture in front of a computer or phone were given through the use of video modeling and practice. In conjunction with the students, a homework assignment was developed to allow them to practice these skills regularly until the next session.
- 7th session: This session covered an overview of every session, the thoughts of the participants, and remarks on the advantages of the sessions. Additionally, it included contact methods, and thanking the participants for their participation, and making recommendations.

Stage 5: Evaluation phase

The program's effectiveness was evaluated by comparing the findings of the pre-test and post-test after the program's intervention using the same pre-test tools (2 and 3).

Ethical consideration

This research was ethically approved by the institutional review board of the Faculty of Nursing, Assiut University (Approval No: 3140022). All participants gave written informed consent to participate in the research. They were assured of data protection and were informed that the data had been anonymized.

Statistical analysis

The IBM SPSS version 20.0 software was used to enter and analyze data. Continuous data were expressed as the mean and standard deviation, whereas categorical variables were expressed as a numbers and percentages. The chi-square test was used to compare categorical groups

under study. For comparison between the means of two related groups (pre and post), paired *t*-tests were used. Pearson's *r* measured the linear association between two continuous variables. Researchers used multiple linear regressions between perception, obstacles regarding e-learning, and other parameters. A *P*-value less than 0.05 was considered statistically significant.

RESULTS

Participants' demographic data

65.1% of the studied students were females, 38.7% were in their second year, 87.7% had no computer courses, and 64.8% had internet facilities at home. Moreover, 81.2% use the telephone for electronic learning, and 47.8% prefer hybrid mode (Table 1).

Student's perceptions mean score in pre- and post-tests

There is a statistically significant improvement ($p < 0.001$) in the mean scores of all sub-items of students' perception after the implementation of the program, with the total mean score of students' perception improving from 42.83 ± 11.67 before the program to 55.91 ± 11.05 after the program with a mean difference of 13.07 (95% CI: 11.364-14.782) (Table 2).

Figure 1 shows the types of students' perceptions regarding e-learning. There is an improvement in the percentage of positive perceptions (90.3%) and a decrease in the percentage of negative perceptions (9.7%), with a statistical difference at post-program implementation ($p = 0.001$).

Obstacles mean score in pre- and post-tests

There is a statistically significant ($p < 0.001$) reduction in the mean scores of all sub-domains of obstacles in the post test with the total mean score of obstacles reduced from 113.90 ± 23.18 before the program to 80.07 ± 30.61 after the program with a mean difference of -33.82 (95% CI (-37.907) -(-29.741)) (Table 3).

Figure 2 compares the percentage of sub-domains of obstacles in pre and post tests. At pre-program, 78.9%, 74.5%, and 70.4% of participants reported the presence of obstacles regarding technical and administrative support, infrastructure, and the technology sub-dimension of obstacles regarding e-learning, and the curriculum content dimension, respectively. However, at the post-program stage, 34.6%, 34.6%, and 28.7% of participants reported the presence of obstacles regarding the same sub-dimension of obstacles.

Baseline measures at the pre-test

The multiple linear regression analysis revealed several significant associations between the examined variables and students' perceptions of e-learning. Taking Computer courses ($P = 0.033$), having internet facilities at home ($P < 0.001$), hybrid modes of learning ($P < 0.001$), greater obstacles to e-learning ($P < 0.001$) and female gender ($P = 0.022$) were associated with lower levels of students' perception toward e-learning (Tables 4). Additionally, lower academic years ($P < 0.05$) were associated with increased obstacles to e-learning (Table 5).

Table 1. The distribution of demographic data of nursing students (N=341)

Variables	Participants (N=341)	
	No	%
Age groups: Mean $\pm$ SD (range)	20.18 $\pm$ 1.19(18-23)	
• 18-20 years	221	64.8
• 21-23 years	120	35.2
Sex		
• Male	119	34.9
• Female	222	65.1
Academic years		
• First	85	24.9
• Second	132	38.7
• Third	77	22.6
• Fourth	47	13.8
Computer courses taken		
• Yes	42	12.3
• No	299	87.7
Internet facility at home		
• Yes	221	64.8
• No	120	35.2
Devices for e-learning activities		
• Computer/Laptop	18	5.3
• Telephone	277	81.2
• Both	46	13.5
Which mode of learning you preferred		
• Only face- to-face	154	45.2
• Only online	24	7.0
• Hybrid	163	47.8

Table 2. The total mean scores of student's perception regarding e-learning and its sub-domains at pre- and post the educational program (N=341)

Items	Pretest	Posttest	P. value	MD	95 % CI
	Mean $\pm$ SD	Mean $\pm$ SD			(Lower – Upper)
Perceived Usefulness of E-learning	12.59 $\pm$ 3.62	16.26 $\pm$ 3.36	<0.001*	3.67	(3.146- 4.197)
Perceived Self-Efficacy of Using E-learning	8.52 $\pm$ 3.27	11.66 $\pm$ 2.88	<0.001*	3.14	(2.677- 3.604)
Perceived Ease of Use of E-learning	11.90 $\pm$ 3.64	15.71 $\pm$ 3.45	<0.001*	3.81	(3.273- 4.340)
Behavioural Intention of Using E-learning	9.82 $\pm$ 3.07	12.28 $\pm$ 2.55	<0.001*	2.45	(3.273- 4.340)
Total score of students' perceptions of e-learning	42.83 $\pm$ 11.67	55.91 $\pm$ 11.05	<0.001*	13.07	(11.364-14.782)

Paired sample t-test P=comparison between Pre-test Vs. Post-test

Md=Mean difference between Pre-test Vs. Post-test

95 % CI= 95 %Confidence Interval of the Mean Difference

*statistically significant difference (p<0.05)

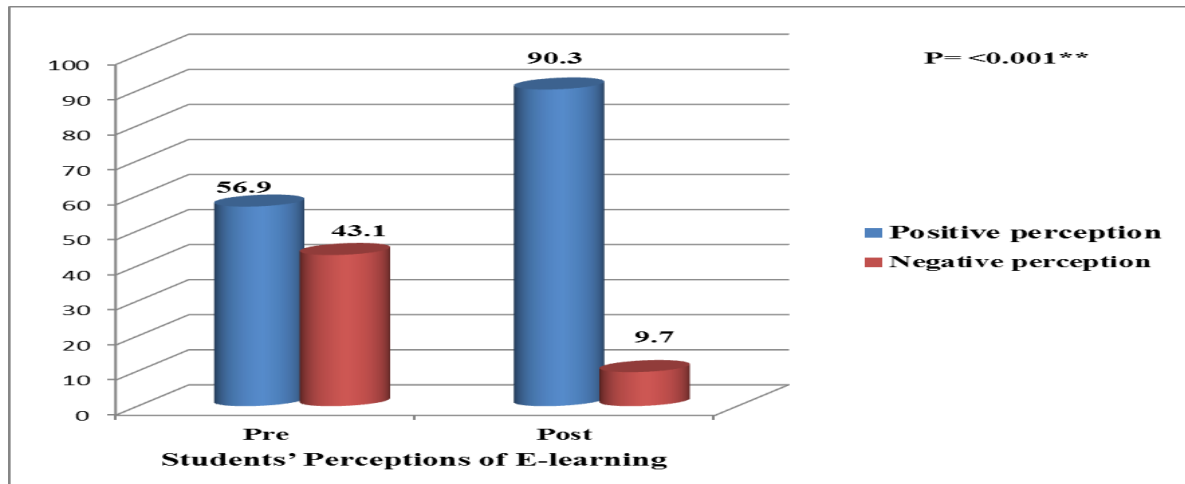


Figure 1. Types of students' perception regarding e-learning at pre- and post the educational program (N=341)

Table 3. The total mean scores of obstacles towards electronic learning and its sub-domains among nursing students at pre-and post the educational program (N=341)

Items	Pretest	Post	P. value	MD	95 % CI (Lower – Upper)
	Mean±SD	Mean±SD			
Learners' characteristics dimension	21.98±6.23	15.81±6.82	<0.001*	-6.17	(-7.149 - (-5.185))
Technical and Management support dimension	24.27±6.09	16.98±7.16	<0.001*	-7.29	(-8.292 - (-6.294))
Infrastructure and technology dimension	23.48±6.12	16.63±6.81	<0.001*	-6.85	(-7.821 - (-5.874))
Curriculum content dimension	22.35±5.28	15.93±6.63	<0.001*	-6.41	(-7.326 - (-5.525))
Instructors' characteristics dimension	21.82±5.82	14.73±6.37	<0.001*	-7.09	(-8.008 - (-6.174))
Total mean score of obstacles of E-learning	113.90±23.18	80.07±30.61	<0.001*	-33.82	(-37.907 - (-29.741))

Paired sample t-test

P=comparison between Pre-test Vs. Post-test

Md=Mean difference between Pre-test Vs. Post-test

95 % CI= 95 %Confidence Interval of the Mean Difference

*statistically significant difference (p<0.05)

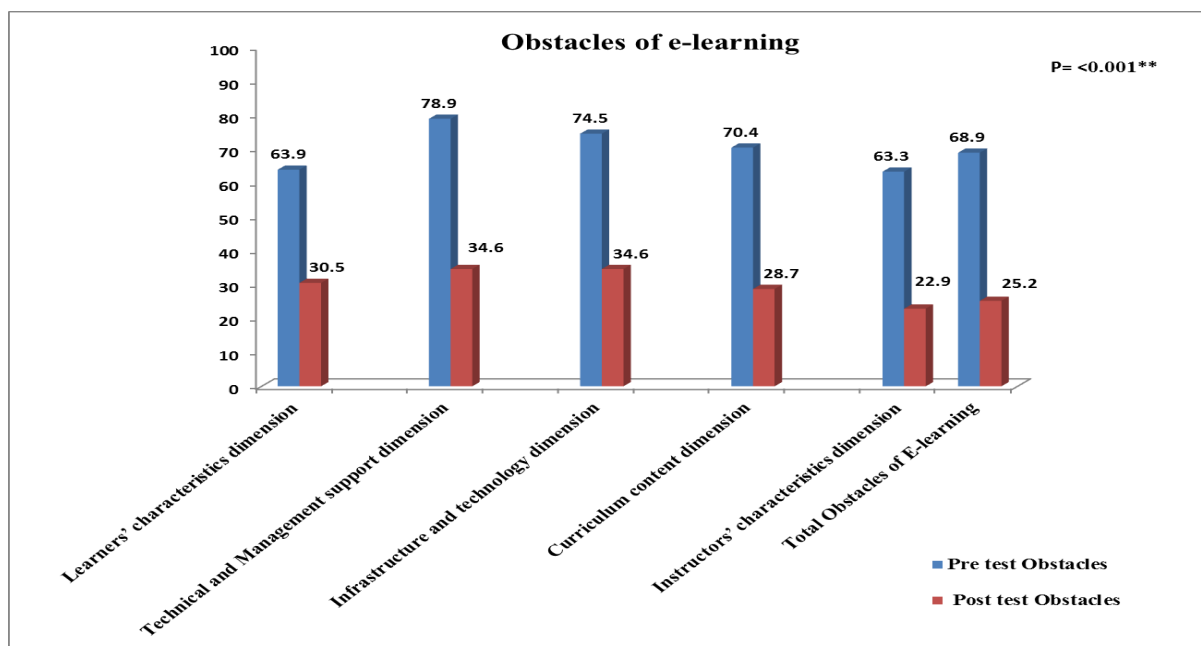


Figure 2. Percentage of obstacles of e-learning among students at pre- and post the educational program (N=341)

Table 4. Multiple linear regression between total perception and other parameters among nursing students at pre educational program (N=341)

Variables	B	Std. Error	Beta	t	P value	Confidence Interval	
						Lower Bound	Upper Bound
Age	0.284	0.720	0.029	0.394	0.694	-1.133	1.701
Gender	-0.196	1.202	-0.008	-0.163	0.871	-2.560	2.168
Academic years	0.599	0.861	0.050	0.696	0.487	-1.095	2.294
Computer courses taken	-3.761	1.756	-0.106	-2.141	0.033*	-7.217	-0.306
Internet facility at home	-4.551	1.202	-0.186	-3.787	<0.001*	-6.915	-2.187
Devices for e-learning activities	0.794	1.357	0.029	0.585	0.559	-1.875	3.463
Which mode of learning you preferred	3.574	0.602	0.296	5.940	<0.001*	2.390	4.758
Total obstacles of e-learning	-0.106	0.025	-0.210	-4.293	<0.001*	-0.154	-0.057

*statistically significant difference ($p < 0.05$)

Table 5. Multiple linear regression between total obstacles of e-learning and other parameters among nursing students at pre educational program (N=341)

Variables	B	Std. Error	Beta	t	P value	Confidence Interval	
						Lower Bound	Upper Bound
Age	0.330	1.603	0.017	0.206	0.837	-2.824	3.483
Gender	-2.137	2.672	-0.044	-0.800	0.425	-7.394	3.120
Academic years	-4.058	1.904	-0.172	-2.131	0.034*	-7.804	-0.311
Computer courses taken	-2.380	3.908	-0.034	-0.609	0.543	-10.067	5.306
Internet facility at home	3.338	2.668	0.069	1.251	0.212	-1.911	8.588
Devices for e-learning activities	-1.206	3.019	-0.022	-0.399	0.690	-7.145	4.734
Which mode of learning you preferred	-2.454	1.333	-0.102	-1.841	0.066	-5.075	0.167

*statistically significant difference ($p < 0.05$)

DISCUSSION

The present study clarified that more than half of the studied students positively perceived e-learning. This could be attributed to various factors such as accessibility, flexibility, convenience, and the use of technology. These findings suggest that e-learning can be an effective and viable option for students during times of crisis or uncertainty, such as the ongoing pandemic; however, it is important to note that more research is needed to understand further the effects of e-learning on students' perceptions and learning outcomes in the long-term.

These observations were in agreement with Rana et al.¹⁴, who revealed that most studied students positively perceived virtual learning. These results were contrasting results of Abbasi et al.¹³, who revealed that most scholars had negative perceptions, might be related to the students' lack of preparation to transfer from in-person to virtual classrooms due to the coronavirus epidemic. Furthermore, this

study was conducted during the early epidemic stages (April 2020), when students had yet to adapt and familiarize themselves with virtual learning.

The present study demonstrated that less than half of the participants had negative perceptions about electronic learning. These can be interpreted as student opposition and refusal to a sudden shift to virtual learning and thus highlight the importance of adequate preparation, support, and accommodations for students to ensure their success in this new learning environment. Rana et al.¹⁴ surveyed a sample of college students and found similar findings; 48% of participants reported having a negative perception of virtual learning.

Therefore, the educational program was valuable in improving participants' perceptions of electronic learning. This was proved by the statistically significant differences in the total mean score and its sub-items of perception regarding e-learning before and after implementing the program. In addition, the mean difference

between pre- and post-program perception scores was 13.07 (95% CIs: 11.364 - 14.782). This indicates that, on average, participants' positive perception scores increased by 13.07 points after implementing the program. The mean difference and confidence intervals further support the robustness and reliability of these findings. An explanation was given to students about the benefits of e-learning, the skills that must be learned to help deal with it, and training on them during the program's implementation, which resulted in simplification and user-friendliness of e-learning systems and thus student acceptance of such technologies.

The current study revealed that before program implementation, nearly two-thirds of the studied students reported the presence of obstacles regarding e-learning. This result follows Teo and Zhou²³, who found that more than half of participating students were concerned about possible obstacles to online learning. These findings disagree with a study by Alshwaier²⁴, who found that students were impressed with the different features offered by Google Apps for Education. Moreover, Lis and Paula²⁵ discovered that most students used educational technology well in their studies. However, they conducted their research in normal settings rather than during a disease pandemic, which might explain the discrepancy.

The current study revealed that technical and administrative support, infrastructure, and technology are major hurdles to electronic learning. This might be a result of low internet bandwidth, a lack of computers in the home, and insufficient training for using the Ministry of Higher Education's programs for the application of online teaching. These may have contributed to students' unfavorable attitudes toward online classes, for which computers and high internet speeds are essential requirements.

These results were similar to a previous study carried out by Mohamed and

Fouad¹⁸, who found that "the highest hurdles in the electronic learning dimensions are in technical and administrative support, infrastructure, and technology." Furthermore, a study conducted by Abdelrazek and Abdallah¹⁹ reported that infrastructure and technology improvements, technical and administrative help, and teaching qualities are the most common features of electronic learning hurdles.

Moreover, the current study is supported by Zalat et al.²⁰, who found that the most challenging obstacles for adjusting to e-learning are inadequate or unstable internet access, insufficient computer laboratories, deficient computers or laptops, and technical issues. Similarly, Ali et al.²¹ found that technical obstacles, such as a lack of technical assistance, inefficient computer systems, and network concerns, are major hurdles to online learning.

Regarding the curriculum content dimension, the present study revealed that two-thirds of the students strongly felt that it was difficult to grasp the subject's contents via electronic learning and that some courses were not given electronically owing to practical issues. This might be because some areas, such as nursing courses, require the learner and teacher to meet in person. Thus, it is difficult for them to understand the content without clarification from real examples or situations alone. This finding is consistent with the results of a study conducted by Yaw Koi-Akrofi et al.²⁶, which found that content concerns one of the most critical issues in electronic learning.

Regarding hurdles posed by instructor characteristics, the study's results indicated that most students strongly agreed that it was hard to reach instructional personnel at home. From the students' point of view, their attitudes toward using e-learning were influenced by their instructors, who played a significant role in simplifying the curriculum, providing feedback, and supervising and monitoring

students' learning. If the instructors do not use electronic learning methods efficiently, students may not use e-learning effectively.

This finding aligns with a study conducted by Osman et al.²⁷, who found that engaged and supportive instructors in the e-learning process can significantly enhance the student experience and lead to better learning outcomes.

The results of this study demonstrated a significant reduction in the mean scores of all sub-domains of obstacles in the post-test compared to the pre-test. The total mean score of obstacles decreased from 113.90 ± 23.18 before the program to 80.07 ± 30.61 after the program. The observed mean difference was -33.82, with a 95% CI ranging from -37.907 to -29.741. These findings indicate a statistically significant improvement in obstacle perception following the intervention program.

Moreover, the multiple linear regression analysis revealed several significant associations between the examined variables and students' perceptions of e-learning. Firstly, the computer courses students took showed a significant association ($P = 0.033$) with their perception of e-learning, indicating that students with greater exposure to computer courses tended to have a reduced perception of e-learning. Secondly, the availability of an internet facility at home showed a highly significant association ($P < 0.001$) with lower levels of perception toward e-learning, suggesting that students lacking internet access at home are more likely to perceive e-learning less favorably.

Furthermore, the learning mode has a significant association ($P < 0.001$) with students' perception of e-learning. Specifically, students engaged in a hybrid mode of learning (combining both online and offline components) had lower levels of perception toward e-learning than those who followed a solely online or offline

mode of learning. Moreover, greater obstacles to e-learning are significantly associated ($P < 0.001$) with lower levels of students' perception toward e-learning. This implies that students who faced more challenges and difficulties in the e-learning environment had lower levels of perceptions toward e-learning than those who experienced fewer obstacles.

Additionally, the results revealed a significant association ($P = 0.022$) between gender and students' perceptions of e-learning. Specifically, female students had lower levels of perception toward e-learning than their male counterparts. Furthermore, lower academic years are significantly associated ($P < 0.05$) with increased obstacles to e-learning. This suggests that students in earlier academic years faced more obstacles in the e-learning environment than those in higher academic years.

LIMITATIONS

The study used a quasi-experimental design in a single location and thus presented a limitation due to generalizability. Besides, the sample was typically large, necessitating more work and time to manage and allowing each participant to participate and display the practice. Moreover, the study might not have accounted for all possible confounding variables that could have influenced the results, such as individual differences, prior experiences, or external support systems that were not explicitly controlled, which may have affected the outcomes.

CONCLUSION

The psycho-educational program effectively improved perception and reduced obstacles faced by nursing faculty students towards e-learning with

statistically significant differences between the pre- and post-test.

IMPLICATIONS OF THE STUDY

This study highlights the importance of investing in programs that foster positive perceptions among students while addressing obstacles they encounter. By implementing such interventions, institutions and educators can create an environment that enhances students' educational experiences and supports their academic development. In addition, this study provides evidence of significant associations between various factors and students' perceptions of e-learning. The findings highlight the importance of considering factors such as computer courses taken, internet facility at home, learning mode, obstacles to e-learning, gender, and academic years in understanding students' perceptions and experiences in the e-learning context.

RECOMMENDATION

This present study recommended applying the psycho-educational program to all college students to improve their perception and minimize obstacles toward e-learning. Moreover, it highlights the importance of regularly measuring nursing students' perceptions and obstacles related to electronic learning regularly, so that efforts can be geared toward enhancing their learning experience.

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CONFLICT OF INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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