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Effect of educational program on the psychological challenges of electronic learning among university nursing students: a quasi-experimental study

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Abstract

The COVID-19 pandemic has precipitated a paradigm shift in educational methodologies worldwide, necessitating a swift transition to e-learning platforms. Consequently, nursing students pursuing university degrees have encountered unique obstacles as they adapt to the e-learning milieu. This study aimed to evaluate the impact of an educational program on e-learning challenges for enhancing the psychological well-being of university nursing students. A quasi-experimental approach utilizing pretest–posttest evaluations was employed to appraise the program's effects on diverse psychological well-being variables. In the initial phase, an extensive literature review was conducted to identify pertinent challenges encountered by nursing students regarding e-learning. Based on this review, an educational program was formulated to address these challenges and fostering psychological well-being. The participants consisted of 341 students who were selected from the Faculty of Nursing at Assiut University. To evaluate the impact of the program, multiple psychological well-being variables, such as anxiety levels, motivation, and satisfaction with the e-learning experience, were measured both before and after the intervention. Psychological challenges towards electronic learning questionnaires were utilized as data collection tools. This study endeavors to provide valuable insights into the effectiveness of the educational program in enhancing the psychological well-being of university nursing students. Here we show that by addressing these challenges and promoting psychological well-being, the educational program has the potential to contribute to the overall success and satisfaction of nursing students in their academic pursuits. Subsequent investigations should delve into the enduring repercussions of such programs and assess their efficacy in diverse academic fields.

Keywords Psychological well-being, University nursing students, Educational program, E-learning, Challenges

Background

Universities all throughout the world moved to online learning as a consequence of the pandemic's troubles. In this context, e-learning has been used by every educational institution, including nursing institutions, to ensure a smooth continuation of the education and learning method [1]. In this respect, Ramos-Morcillo et al. [2] found that as scholars transitioned from traditional learning to virtual learning throughout the plague, they considered virtual learning to be more upsetting because

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the individual feels anger when forced to do the activity [3].

E-learning is a substitute for traditional teaching that may also be used in tandem with it [4]. Electronic learning has been identified as an educational strategy that enhances learning via the use of information technology and communication, giving students access to all needed educational programs [5], while e-learning offers the flexibility of taking lessons from anywhere at any time [6]. But integrating e-learning into learning and teaching may be a tough process with several hurdles [7]. Many individuals in Egypt are not familiar with using computers and the internet, which can make it difficult for them to navigate online learning platforms [8]. They also worry about technological advancement [9]. To be effective in the online setting, online learners must have not just computer abilities, but also the ability to explore the internet and use suitable resources; they faced confused teacher comments and instructions on the course site, which generated anxiety [10].

In this regard, Sasmal and Roy [1] found that the majority of students reported feeling anxious when they learned that electronic learning meetings would be held and that roughly two-thirds stated that they felt anxious about completing the curriculum. Also, Fawaz and Samaha [11], found that about 30% of the students felt anxious about their ability to use electronic learning successfully. Computer anxiety is an emotional reaction caused by apprehension about a negative consequence after utilizing a computer [12]. Because of the poor internet connection, 85.5% of people reported feeling more stressed [13].

Motivation is not a characteristic that lasts a lifetime. Rather, it is a dynamic condition that can be impacted by environmental elements such as pedagogy and interaction, as well as nursing students' active motivation control throughout teach [14]. One of the most common obstacles encountered by nursing students during online learning was a lack of motivation [15]. In this respect, Kuruvilla et al. [16] Found that the majority of students cited a lack of motivation as one of the difficulties of electronic learning.

Student satisfaction is described as a learner's impression of the value of educational experiences in a learning environment [17]. Student satisfaction is an essential notion because it may lead to increased levels of enthusiasm, engagement, performance, learning, and achievement [10]. According to Jyoti et al. [18], 57% were dissatisfied with their online education. Dissatisfied students find it difficult to concentrate on their academics, which leads to poor performance [19]. In this context, according to the findings of recent journal studies, the majority of the studies concentrated on assessing anxiety,

motivation, and satisfaction from e-learning. As a result, there is limited research into psycho-educational interventions for students in e-learning to deal with the difficulties associated with it.

Therefore, it is critical for teachers to make students feel at ease so that they may study and grow from their abilities. They may accomplish this by offering assistance, support, and reinforcement, as well as supporting and assisting the student in identifying transferable talents that they can use in any clinical environment during their career [20]. So, the aim of this study was to evaluate the impact of an educational program on e-learning challenges for enhancing the psychological well-being of university nursing students.

Method
Samples and procedure
The research employed a pretest–posttest design, adopting a quasi-experimental methodology to assess the effects of the program on diverse variables associated with psychological well-being [21, 22]. Initially, a thorough literature review was undertaken to ascertain the primary e-learning challenges encountered by nursing students. These challenges encompassed heightened levels of anxiety, reduced motivation, and decreased satisfaction. Utilizing the findings from this review, an educational intervention program was devised to specifically address these challenges and foster psychological well-being.The participants were recruited from the Faculty of Nursing at Assiut University throughout the 2021–2022 academic years based on the next eligibility criteria: those who consented to participate in the study and utilised online education using a stratified randomization method where the population has diverse subgroups (different academic years) and researchers want to be sure that the sample includes all of them. The sample size was calculated using the Epi Info program, version 3, where the total population size was 2982 students and the confidence coefficient was 95%. It consisted of 341 students from four academic years, who were randomly chosen using the random number method and divided into the following groups:

Year	Total no. of students in each year	Sample size	Percent %
First year	757	85	24.9
Second year	1150	132	38.7
Third year	663	77	22.6
Four year	412	47	13.8
Total	2982	341	100

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The study was ethically approved by the institutional review board of the Faculty of Nursing at Assiut University (Approval No. 3140022) as part of the thesis.

Measurements

Students' demographics include the following: The researcher designed a demographic survey that covered information such as the participant's age, gender, academic standing, previous computer course work; devices used for electronic learning, availability of internet access at home, and preferred method of learning.

Psychological challenges towards electronic learning questionnaire: The researcher developed a tool for evaluating the psychological challenges faced by students in the Faculty of Nursing related to e-learning. This tool was created after conducting a review of relevant literature [10, 23–27]. It consists of three sections, each with seven items, rated on a five-point Likert scale.

The scoring system is as follows:

I: Anxiety towards e-learning	Rated from "1" (not at all) to "5" (extremely): Scores of 7–14 indicate low levels of anxiety Scores of 15–21 indicate moderate levels of anxiety Scores of 22–35 indicate high levels of anxiety
II: Motivation towards e-learning	Rated from "1" (strongly disagree) to "5" (strongly agree): The scores are summed up, divided by the number of items, and transformed into a percent score A score of 60% or higher is considered motivated, while a score below 60% is considered unmotivated
III: Satisfaction with e-learning	Rated from "1" (strongly disagree) to "5" (strongly agree): The scores are summed up, divided by the number of items, and transformed into a percent score A score of 60% or higher is considered satisfactory, while a score below 60% is considered unsatisfactory

Validity and reliability

The validity of the tool was established through the evaluation of five experts from Assiut University's nursing and medical faculties. Subsequent to the professional opinion of the professionals, some elements were adjusted to better suit the nursing students. They employed the Cronbach alpha coefficient test to assess the internal reliability and pertinence of the tool's information, yielding coefficients of 0.922 for anxiety, 0.931 for motivation, and 0.937 for satisfaction.

The pilot study

10% of the sample was recruited for the pilot study to evaluate the clarity, feasibility, and effectiveness of the study instruments and to determine the required time for data collection. The tools remained unchanged and were easily understood by the students. Consequently, all participants included in the pilot study were included in the main study.

Procedure for data collection

1st stage: preparatory phase

To do the intervention and get a full understanding of the features of the study topic, the researchers studied present, past, local, and universally relevant literature. The study was officially accepted after Assiut University's faculty of nursing dean submitted a letter of approval.

2nd stage: recruitment and group allocation

The students were contacted through classroom announcements. The researcher began to collect a sample of students. The researchers presented themselves to the students and discussed the study's goal and methodology. These students were divided into nine groups (six groups consisted of 37 students, two groups consisted of 36 students, and one group consisted of 47 students). The researcher communicated with those subjects by mobile phone, making group schedules for each group to tell them about the time of each session in the program. All groups met with the researchers once a week (two sets per day, and 1 day contained three groups).

3rd stage: pretest assessment

Students were told to complete a questionnaire form, which took around 15 to 20 min. The information was largely assessed to lay the groundwork for the intervention sessions.

4th stage: the planning phase

Following a review of relevant literature, the contents of the intervention were prepared by the researcher in the form of a booklet in Arabic according to the needs of the selected participants, the study objectives, and the data attained during the assessment phase. The recognized requirements were turned into intervention goals and targets, which were then included in a brochure. Participants were provided the pamphlet as a self-study guide.

Goals of the intervention

- Be aware of the meaning, concept, and types of electronic learning.
- Discuss the reasons for moving towards electronic learning and its advantages.

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- Discuss the psychological challenges of e-learning and suggest solutions for them.
- Identify the necessary skills to deal with courses of e-learning and some coping methods, such as strategies for relaxing (deep breathing, progressive muscle relaxation, and meditation exercises), to deal with anxiety towards e-learning.
- Apply the instructions associated with a healthy position in front of the computer or phone and maintain it. Practice relaxation techniques to overcome anxiety.
- The obvious importance of motivation and satisfaction from e-learning for academic performance.

Implementation phase

The program was delivered to participants in eight sessions, one per week for each group; each session's purpose and title reflected its content. Each session continued for 45 to 60 min, and all students were educated using the same content and techniques, such as the booklet, videos, and conversations. From October 2021 to the end of December 2021, the intervention was in effect. Photographs and videos were exhibited in a data show during the sessions to ease learning and explain the intervention brochure. To accommodate the students' knowledge level, a brief linguistic recap of what was taught in the previous session is offered at the start of each session. Incentive and support tactics, such as praise, were utilised during the session to promote active participation and learning.

The following were the sessions:

Session	Content
First	In this session, the researchers gave a summary of the intervention, including the intervention's goal, the number of sessions, the duration of each session, the benefits of using it, and the meeting places and times for each group. The pretest was then conducted using the data collection sheet
Second	The researcher discussed the concept of electronic learning, the types and reasons for moving towards electronic learning, the advantages of electronic learning, and its psychological challenges in this session
Third	Following a review of the previous session, students learned about the concept of electronic learning, as well as the types, reasons for moving towards electronic learning, advantages of electronic learning, and psychological challenges of electronic learning

Session	Content
Fourth	Throughout this session, the researchers provided data about the necessary skills to deal with courses of e-learning as well as how to use an e-learning platform such as Moodle. During the session, a combination of video modeling and practice was used to teach. In consultation with the students, a homework assignment was developed to allow them to practice these abilities on a regular basis until the next session
Fifth	Taught the students about maintaining a healthy position in front of the computer or phone, and the concept of relaxation and its significance, trained students on various relaxation techniques (deep breathing exercises, progressive muscle relaxation, and meditation exercises), explaining and applying the steps many times throughout the session, ensuring that participants understand the relaxation techniques (demonstration and re-demonstration) and developed a homework assignment to allow them to practice these abilities on a regular basis till the next session
Sixth	Students were instructed to present a recap of the preceding abilities, comprehend their experience, and respond to previous session
Seventh	Understand the importance of motivation and satisfaction from e-learning for academic performance by discussing the concept and importance of motivation, ways for self-incentives, and the motivation of students towards electronic learning
Eighth	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 thanked the participants for their participation and recommendations

5th stage: evaluation phase

The usefulness of the program in reducing anxiety levels and increasing motivation and satisfaction with online learning was assessed by comparing the findings of the pretest and posttest.

Data analysis

SPSS version 20 was used for data entry and analysis. The data were given in the form of numbers, percentages, means, and standard deviations. To compare categorical quantitative variables, the Chi-square and Fisher exact tests were utilized. To compare quantitative data before and after the training program, a paired samples *t*-test

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was used. To compare quantitative variables between two groups, an independent sample *t*-test was used, and for more than two groups, an ANOVA test was utilized. The Pearson correlation coefficient was used to measure the correlation between quantitative variables. The *p*-value is considered statistically significant when the *p*-value is 0.05.

Results

The studied students' demographic (Table 1)

Approximately 64.8% of the studied students fall within the age range of 18 to 20, with 65.1% of them being female. 38.7% of the students are in their second year of university. Nearly 87.7% of the students do not participate in computer courses, while 64.8% have internet access at home. The majority of the students under investigation (81.2%) prefer using their phones for e-learning, while 47.8% prefer the hybrid method.

Table 1 The studied students' demographic ($N = 341$)

Variables	Studied students ($N = 341$)	
	No	**%**
Age groups: mean ± SD (range)	**20.18 ± 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**

Levels of psychological challenges towards electronic learning (Figs. 1, 2, 3)

Figure 1 shows the level of anxiety towards electronic learning: 50.2% and 12.6% of students experienced high and low levels of anxiety throughout program implementation, respectively. However, they reported a decrease in high levels of anxiety and an increase in low levels of anxiety after program implementation (15.8% and 53.1%, respectively). There is a highly statistically significant (*p* 0.001) difference in the degrees of anxiety towards e-learning before and after program implementation.

Figure 2 shows levels of motivation towards electronic learning; at the time of pre-program implementation, 38.4% of respondents said they were unenthusiastic about e-learning. However, during the post-program, 9.1% only reported that they were unmotivated. There is a significant difference in e-learning motivation levels between before and after program implementation (*p* 0.001).

Figure 3 shows levels of satisfaction towards electronic learning; 39% of respondents were unsatisfied with e-learning at the time of pre-program implementation. However, during the post-program, only 6.7% reported that they were unsatisfied. There is a significant difference in e-learning satisfaction levels between before and after program implementation (*p* 0.001).

Correlation between anxiety, motivation, and satisfaction towards electronic learning

Table 2 shows that there is a negative statistically important correlation between the anxiety score and the motivation and satisfaction scores from electronic learning during pre- and post-implementation of the psycho-educational program ($r = -0.392$, -0.692, -0.350, -0.655, and $p = 0.000$, respectively).

Relationship between the studied students' demographic and psychological challenges towards electronic learning (Table 3)

The findings indicate that while demographic characteristics do not significantly impact anxiety regarding electronic learning, academic year does play a significant role. There are no statistically significant differences among all demographic characteristics and anxiety towards e-learning except for the academic year (*p* value = 0.000) at post-program implementation.

The findings indicate that demographic characteristics, except for age, have a significant impact on motivation regarding electronic learning at the time of program implementation. With the exception of gender and academic year, there are no significant differences in all demographic characteristics at post-program implementation (*p* values of 0.015 and 0.000, respectively).
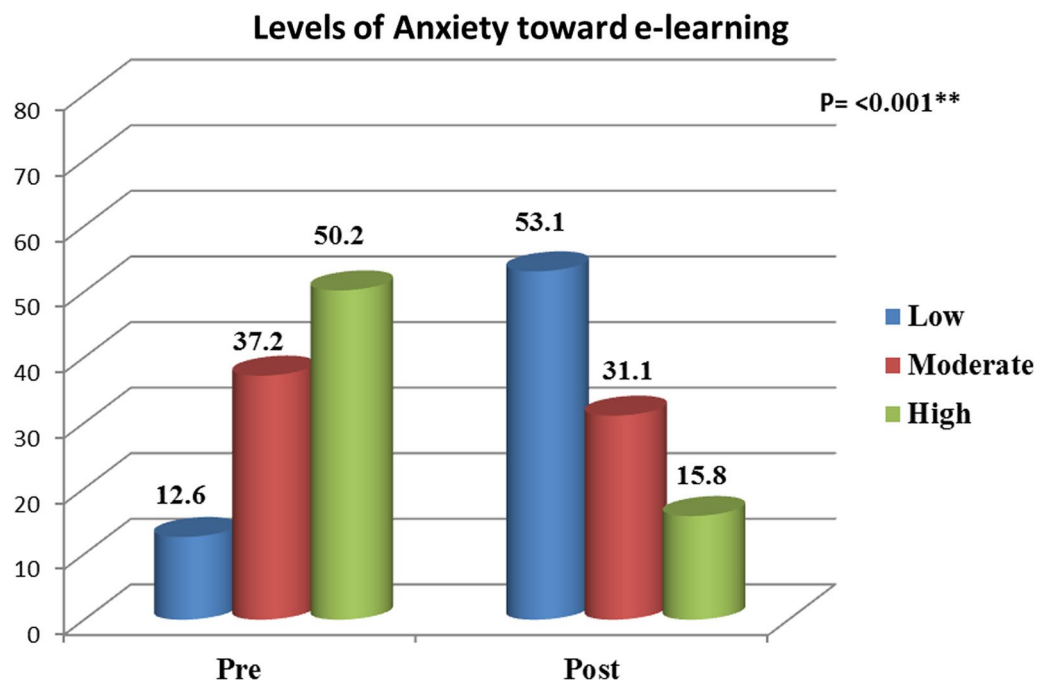
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Levels of Anxiety toward e-learning

Fig. 1 Levels of anxiety toward e-learning among students at pre- and post-implementation of the psycho-educational program (*N*=341)
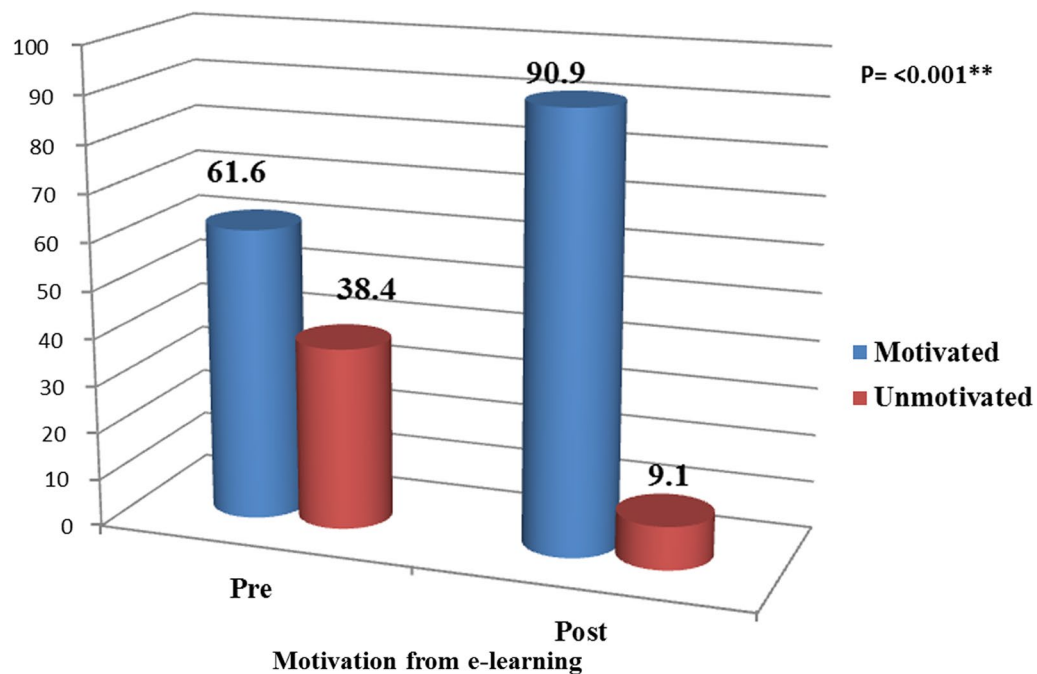

Fig. 2 Levels of motivation regarding e-learning among students at pre- and post-implementation of the psycho-educational program (*N*=341)

Moreover, demographic characteristics have a significant impact on satisfaction with electronic learning at the pre-program implementation stage except for age, sex, and academic year (*p* values of 0.032 and 0.000, respectively) at post-program implementation.

In order to cultivate an educational milieu that nurtures psychological well-being, it is imperative for institutions of higher learning to acknowledge and confront the unique challenges encountered by students. Progressing ahead, it is of paramount importance to
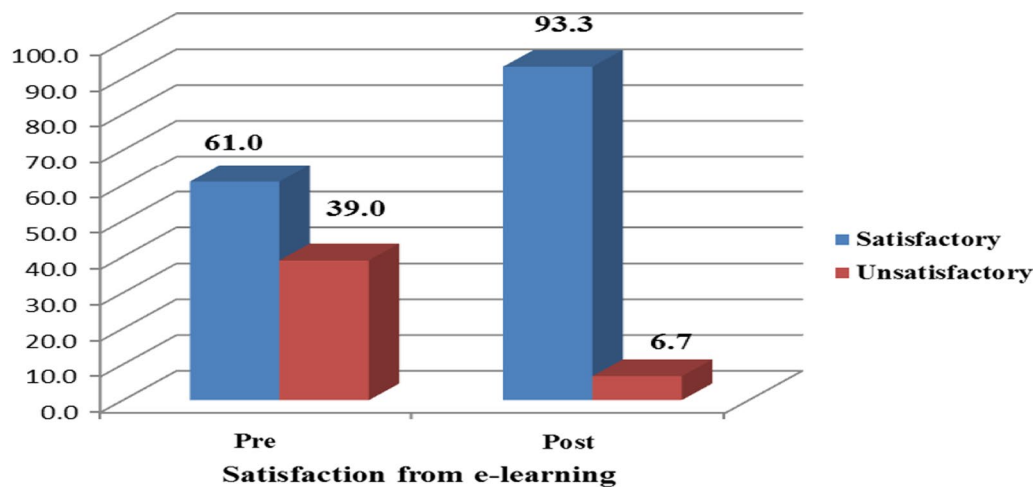
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Fig. 3 Levels of satisfaction from e-learning among students in pre and post-implementation of the psycho-educational program (*N* = 341)

Table 2 Correlation between anxiety towards e-learning, motivation and satisfaction from e-learning among students (*N* = 341) at pre- and post-implementation of the psycho-educational program

Correlations	Motivation toward e-learning				Satisfaction from e-learning			
	Pre		Post		Pre		Post	
	r	*P*	*r*	*p*	*r*	*P*	*r*	*P*
Anxiety toward e-learning	− 0.392	0.000**	− 0.692	0.000**	− 0.350	0.000**	− 0.655	0.000*

** Highly statistically significant difference ($p < 0.01$)

* Statistically significant difference ($p < 0.05$)

persevere in the exploration of inventive methodologies and interventions that prioritize the comprehensive growth and mental well-being of students within the context of the digital age.

Discussion

The present study findings shed light on the significance of addressing the unique challenges faced by students in the digital learning environment. The results revealed that the implementation of the educational program led to notable improvements in psychological well-being of students, including reduced anxiety levels, heightened motivation, and enhanced satisfaction. Building upon the previous work in this area, our study seeks to extend the understanding of the impact of e-learning challenges on psychological well-being in university nursing students. By implementing an educational program specifically designed to address these challenges, we aim to explore the potential for improving the psychological well-being of nursing students in this context.

Nursing students encounter increased levels of anxiety as well as detrimental impacts on their well-being as a result of their fears. While studying how anxiety affects

nursing students' health gives significant insight into their experiences, given the negative consequences of growing anxiety levels, it is critical to offer good management programs and strategies to cope with and diminish anxiety in nursing students, paying attention to these techniques of stress and anxiety management is very important [28]. Also, a study by Fawaz and Samaha [11], found a strong connection between student satisfaction in undergraduate university students who were educated through online platforms and the frequency of stress, anxiety, and depression. This has a negative influence on the motivation of nursing students to learn [29]. So the goal of this study was to evaluate the effects of a psycho-educational program on nursing students' anxiety, motivation, and satisfaction with electronic learning.

The present study revealed that the average age of the scholars studied was (**20.18 ± 1.19**). This age range is considered to be the prime age for learning and is also a crucial period for personal and professional development, which is parallel to previous studies reported by Thapa et al. [13], Ibrahem et al. [25], and Mohamed and Fouad [30], who discovered that the mean age of students

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Table 3 Relationship between the studied students' demographic and psychological challenges towards e-learning (*N* = 341) at pre- and post-implementation of the psycho-educational program

Variables	N	Psychological challenges towards e-learning					
		Anxiety towards e-learning		Motivation towards e-learning		Satisfaction from e-learning	
		Pre	Post	Pre	Post	Pre	Post
		Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age groups							
18–20 years	221	21.70 ± 5.85	14.78 ± 6.53	21.38 ± 6.64	28.20 ± 5.90	21.43 ± 6.61	28.60 ± 5.72
21–23 years	120	20.17 ± 5.70	15.63 ± 6.72	22.29 ± 5.67	27.90 ± 6.01	22.44 ± 5.66	28.58 ± 5.11
T		2.336	− 1.143	− 1.280	0.444	− 1.425	0.022
P value		0.020*	0.254	0.201	0.657	0.155	0.982
Sex							
Male	119	19.65 ± 6.52	16.02 ± 6.99	22.87 ± 7.36	27.03 ± 6.77	22.11 ± 6.91	27.72 ± 6.04
Female	222	21.97 ± 5.27	14.58 ± 6.34	21.07 ± 5.60	28.67 ± 5.36	21.61 ± 5.96	29.06 ± 5.15
T		− 3.570	1.929	2.518	− 2.453	0.700	− 2.147
P value		0.000**	0.055	0.012*	0.015*	0.485	0.032*
Academic years							
First	85	20.68 ± 6.85	16.07 ± 7.03	21.27 ± 7.41	26.69 ± 6.43	20.92 ± 7.22	27.20 ± 5.98
Second	132	21.86 ± 5.57	12.58 ± 5.23	21.39 ± 6.32	30.83 ± 3.64	21.82 ± 6.60	30.95 ± 4.13
Third	77	21.68 ± 5.20	17.77 ± 6.53	21.05 ± 4.97	25.22 ± 6.14	21.36 ± 4.94	26.14 ± 5.46
Fourth	47	19.23 ± 5.17	15.91 ± 7.12	24.40 ± 5.59	27.64 ± 6.76	23.94 ± 5.22	28.51 ± 5.59
F		2.768	12.663	3.453	19.913	2.513	17.065
P value		0.042*	0.000**	0.017*	0.000**	0.058	0.000**
Computer courses taken							
Yes	42	18.98 ± 5.65	13.52 ± 5.97	25.02 ± 6.23	29.10 ± 6.31	24.14 ± 6.36	29.88 ± 5.26
No	299	21.47 ± 5.80	15.30 ± 6.66	21.23 ± 6.20	27.95 ± 5.88	21.45 ± 6.23	28.41 ± 5.52
t		− 2.615	− 1.635	3.711	1.169	2.615	1.624
P value		0.009**	0.103	0.000**	0.243	0.009**	0.105
Internet facility at home							
Yes	221	20.16 ± 5.77	15.19 ± 6.81	22.71 ± 6.23	27.88 ± 6.31	22.75 ± 5.89	28.58 ± 5.46
No	120	23.00 ± 5.51	14.88 ± 6.20	19.84 ± 6.09	28.48 ± 5.18	20.00 ± 6.67	28.61 ± 5.60
t		− 4.404	0.403	4.089	− 0.893	3.932	− 0.039
P value		0.000**	0.687	0.000**	0.373	0.000**	0.969
Devices for e-learning activities							
Computer/laptop	18	18.83 ± 5.60	17.06 ± 5.75	22.72 ± 7.04	26.56 ± 6.63	22.44 ± 6.78	28.56 ± 4.93
Telephone	277	21.87 ± 5.58	15.01 ± 6.65	20.93 ± 5.92	28.39 ± 5.53	21.31 ± 6.19	28.78 ± 5.27
Both	46	17.78 ± 6.08	14.70 ± 6.59	25.91 ± 6.75	26.89 ± 7.67	24.39 ± 6.23	27.48 ± 6.91
F		11.940	0.898	13.428	1.912	4.945	1.104
P value		0.000**	0.408	0.000**	0.149	0.008**	0.333
Which mode of learning you preferred							
Only face-to-face	154	22.18 ± 5.34	15.76 ± 6.47	19.42 ± 5.64	27.80 ± 5.32	18.78 ± 5.28	28.07 ± 4.98
Only online	24	17.29 ± 7.02	15.29 ± 6.99	23.33 ± 8.38	27.00 ± 6.48	24.13 ± 7.61	28.54 ± 5.78
Hybrid	163	20.77 ± 5.84	14.40 ± 6.63	23.61 ± 5.90	28.53 ± 6.38	24.28 ± 5.76	29.09 ± 5.91
F		8.314	1.689	20.310	1.047	39.071	1.365
P value		0.000**	0.186	0.000**	0.352	0.000**	0.257

**Highly statistically significant difference ($p < 0.01$)

*Statistically significant difference ($p < 0.05$)

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were (**19.34 ± 1.46** and **20.78 ± 0.415** and **20.91 ± 1.55**), respectively.

A significant portion of students studied hadn't taken computer courses. This might be due to the fact that computer courses are not mandatory, the cost of in-service training for them is high and they may choose to take other courses instead. This result is supported by Ibrahem et al. [25] who stated that no computer courses had been taken by more than three-quarters of the students studied. In terms of internet access at home, the existing study reported that roughly two-thirds of the students studied had access to the internet at home. These results are similar to those of a previous study reported by Mohamed and Fouad [30], which revealed that about two-thirds of the students studied, had home internet access.

The results of the existing study showed that more than half of the students studied had significant levels of anxiety towards e-learning at the time of program implementation. This might be due to the students sense of being overloaded after electronic learning [2], in addition to the fact that a significant portion of the students had not taken computer courses. Also, there was a high statistically significant difference in the reduction level of high anxiety from 50.2% at pre-program to 15.8% after implementing the program. This might be due to the educational sessions that were adapted to the wants and interests of the students, allowing them to use e-learning effectively. Furthermore, in Perera et al. [31], they reported that spiritual interventions, such as meditation and praying can reduce anxiety and provide favorable psychological, physiological, and spiritual outcomes.

Regarding motivation towards electronic learning, the existing study shows that more than one-third of the participants were unmotivated towards electronic learning in pre-program. Which experienced difficulties; this can be explained by the fact that learners are generally more comfortable with traditional-style teaching where the teacher takes control of everything in the teaching space [32], which is similar to that recorded in a prior study reported by Kuruvilla et al. [16] who found that the majority of students cited a lack of motivation as one of the difficulties of electronic learning. Also, there is a significant difference in e-learning motivation levels between before and after program implementation, and more than a third of respondents report being unenthusiastic about e-learning. However, during post-program, 9.1% only reported that they were unmotivated. This finding highlights the effectiveness of using educational programs in enhancing student motivation towards e-learning. Where students with a lower anxiety level will properly motivate themselves in the learning experience of e-learning, this result can have important implications for educational institutions, as they can consider incorporating educational programs into their e-learning programs to improve student motivation.

Regarding satisfaction from e-learning, Pourtavakoli et al. [33], revealed that some major aspects that influence learner satisfaction include the learners' perspective towards the computer, anxiety about the computer, and self-efficacy. The present study revealed that less than two-thirds of the students studied were satisfied with the electronic learning program; from the students' point of view, they felt that e-learning provided them with a flexible schedule, they also appreciated the availability of online resources, such as video lectures, reading materials, and interactive activities. Additionally, they felt that e-learning allowed them to study at their own step and gave them the opportunity to review and revisit the material as many times as they needed. This result is parallel to that reported in an earlier study by Ibrahem et al. [25], who found that the majority of the students studied were satisfied with their electronic learning experience.

Despite these positive findings, more than one-third of participants reported unsatisfactory electronic learning experiences in pre-program implementation; this could be due to a variety of reasons, such as poor internet connectivity, inadequate technical support, a lack of interaction with instructors and peers, a lack of hands-on activities, and difficulty accessing course materials. In addition to the worry of adopting new technologies, there are poor attitudes towards electronic learning and the perception that electronic learning is an additional workload [34].

Also, there is a significant difference in e-learning satisfaction levels between before and after program implementation, with more than one-third of respondents were unsatisfied with electronic learning at the time of pre-program implementation. However, post-program, only 6.7% reported that they were unsatisfied. This proves those educational sessions were effective in improving satisfaction level regarding electronic learning.

The present study exhibited that anxiety negatively correlated with motivation and satisfaction from electronic learning; this could be explained as high levels of anxiety can lead to procrastination and avoidance behaviors, which can further decrease incentive and satisfaction regarding electronic learning. The anxiety may cause the individual to feel intimidated by the material or overwhelmed by the demands of online learning, making it difficult for them to stay engaged and motivated. This observation is consistent with another previous study by Bolliger and Halupa [10], which found that anxiety was negatively correlated with student satisfaction.

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The improvement in level of motivation, satisfaction, and decrease in level of anxiety in this study after implementing the program could be related to the interest of the nursing students in acquiring knowledge about electronic learning and how to deal with its requirements, the clarity and consistency of the program's content, the simple language used, and the appropriate teaching methods that were incorporated.

Implications of findings and future research

The findings of this study have significant implications for both academia and practice. Firstly, from an academic perspective, this study will contribute to the growing body of knowledge on the psychological well-being of university nursing students in the context of e-learning. It will shed light on the specific challenges faced by these students and the potential impact on their mental health. Secondly, from a practical standpoint, the results of this study can inform the development and implementation of educational programs aimed at addressing the identified challenges and improving the psychological well-being of nursing students.

Limitations

The present study employed a quasi-experimental design within a singular research setting, thereby exhibiting a limitation pertaining to the extent of generalizability. Moreover, the acquisition of a representative sample and the preservation of participant engagement over the duration of the study may pose logistical obstacles. Additionally, the fluid characteristics inherent in technology and e-learning platforms may introduce supplementary intricacies, necessitating an ongoing adaptation of the educational program.

Conclusions

In conclusion, the research on the impact of an educational program addressing e-learning challenges has provided valuable insights into enhancing the psychological well-being of university nursing students. By recognizing the unique difficulties faced by students in the virtual learning environment and implementing targeted interventions, educational institutions can play a pivotal role in supporting students' mental health and overall well-being. These considerations pave the way for further research and the development of evidence-based interventions to foster a supportive and thriving e-learning environment for nursing students and beyond.

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