

Impact of Online Learning Platforms on Nursing Education Outcomes: A Comprehensive Systematic Review

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Abstract

Background: Online learning has positive and negative impact on nursing education. The present systematic review is aimed to examine the impact of online learning platforms on nursing education outcomes in Saudi Arabia. **Method:** To classify important research published between 2017 and 2023, a comprehensive search of databases such as PubMed, Scopus, and Web of Science was done. The inclusion criteria for this study were studies written in English that specifically studied the impact and results of online learning platforms, E-learning platforms, nursing education, and so on. Furthermore, the studies chosen had to use well-established scales for measurement and provide useful data on team dynamics. Ten studies were included in the synthesis after initial screening and quality assessment. **Results:** Within this systematic literature, six themes are identifies which are as dissatisfaction with online learning platform; Nurses have different perspective about Online learning platforms; Nurses' attitude link the outcomes of online learning platform; Psychological well-being link with positive impact and outcomes of online learning platform; Depressiveness and hopelessness link with the ambiguity in studies during online learning platform and Supportive educational environment needed during online learning. **Conclusion:** It is concluded that impact and outcome of online learning platforms in nursing education have both negative and positive, which is, depend on the students' attitude, perception, psychological well-being and environmental support.

Keywords: online learning platforms, outcomes, impact, nursing education

1. Introduction

Throughout the COVID-19 epidemic, online classes have gradually become a key element of the worldwide education system. Almost everyone may now access and manage educational processes through online classrooms. The notion of online and distance learning has been around for a few decades, but its impact in Saudi Arabia has only been measured in the last few years when contrasted with the traditional classroom technique in universities and institutions of higher learning. The conventional teaching method in the Saudi educational system has traditionally been the most visible. In comparison, the expertise and familiarity of using conventional teaching methods and the lack of demand for distant methods of delivering education, particularly amongst students, have been key impediments to the deployment of online education

(Shahbal et al., 2023; Junaid et al., 2023).

Many students believed online learning programs were easier than traditional classes, whereas few believed differently. The vast majority of students recorded and took notes on the online lectures. Students felt more confident in enrolling in online classes rather than traditional classes. They believe that teachers should educate themselves to adopt sophisticated teaching methods and be creative in creating novel and successful approaches to teaching their students (Ahmed, 2020; Alharbi et al., 2022).

Over 40% of undergraduate nursing students found online learning difficult during the COVID-19 epidemic, and more than 45% found it extremely stressful. Furthermore, during the COVID-19 outbreak, undergraduate nursing students expressed low satisfaction (less than 40%) and moderate satisfaction (more than 45%) with online learning. The undergraduate nursing student's

academic performance was influenced by the COVID-19 pandemic, resulting in low to fair academic performance. The worldwide outbreak affected more than 42% and more than 30% of the students. Online learning stress was significant and inversely related to satisfaction with online education and academic success (Oducado & Estoque, 2021). E-learning is an excellent way to continue your education, but it is ineffective in underdeveloped nations like Nepal unless the elements impacting the online education process are considered. This discovery will aid in resolving the actual problem encountered by professors and students while conducting online classes to improve the educational system's effectiveness (Subedi et al., 2020).

In total, 60 nursing students exhibited negative views regarding e-learning. The maximum total impediments among students studying in the first year were more than 65%, while the lowest number of total barriers present among academic learners in the following year was more than 50%. Facility and technological advances, technical and managerial support, and teacher qualities were the most common elements of e-learning hurdles (87%, 85%, and 83%, respectively). A substantial statistically significant negative link existed between nursing students' challenges and their views toward e-learning (Diab & Elgahsh, 2020).

Stress generated by unexpected changes during the COVID-19 crisis affected nurse-midwife students. The majority of those who took part demonstrated moderate stress resilience. The following main themes emerged from the focus groups: Recognizing the consequences of COVID-19 on academic and social life, viewing change as a chance to grow and a challenge that increases self-discipline, and recuperating with the help of family, teachers, and peers (Karuna & Jittitaworn, 2023).

The majority of nursing students had a higher mean

score of satisfaction with electronic tests at Qassim (81%), Umm al-Qura (83%), Tiba (73%), and Shaqra (75%), with a statistically significant difference. Most students' satisfaction with electronic tests varied from highly agree to agree. Students must maintain and obtain frequent, periodic in-service knowledge of computer courses. The quality of learning, accessibility of instruction and training, and the cost-effectiveness of education all benefit from maintaining and developing learning environments made possible by technology (Qalawa et al., 2021; Shahbal et al., 2022).

2. Method

Research Objective

The objective of the present study was to examine the impact of online learning platforms on nursing education outcomes.

Research Questions:

In this systematic review, the research questions include the following;

- What is the impact of online learning platforms on nursing students' education?
- What are the outcomes of online learning for nursing students?

Literature Search Strategy:

A detailed and methodical examination of academic databases identified relevant papers published in peer-reviewed journals. PubMed, Scopus and Web of Science were among the searchable databases to be searched. The search phrases were chosen with care to include relevant themes, such as "Online learning," "E-Learning," "Nursing Students," "Online Learning Outcome," "Impact of E-Learning on Education," and "KSA."

Syntax 1	"Online Learning," "Nursing," "Education," "KSA:"
Syntax 2	"Impact of E-Learning Platforms," "Impact of Online Learning Platforms," "Nursing Students," "KSA:"
Syntax 3	"Outcomes of Online Learning Platforms," "Outcomes of E-Learning Platforms," "Nursing Students Education," "KSA:"

No	Database	Syntax	Year	No of Researches
1	PubMed	Syntax 1	2019-2023	4
		Syntax 2		18
		Syntax 3		3
2	Scopus	Syntax 1		8569
		Syntax 2		8767
		Syntax 3		8738
3	Web of Science	Syntax 1		2009
		Syntax 2		1280
		Syntax 3		165

To discover relevant research publications, three prominent databases were used: Scopus, PubMed, and Web of Science—the chosen search to assure validity and applicability focused on papers issued during 2019 and 2023. According to the statistics, Scopus produced the greatest number of research articles, totalling 26,074. PubMed contributed 23 articles, while Web of

Science contributed 4654. These findings show the thoroughness of the scientific search and lay a solid foundation for the next steps of the systemic review.

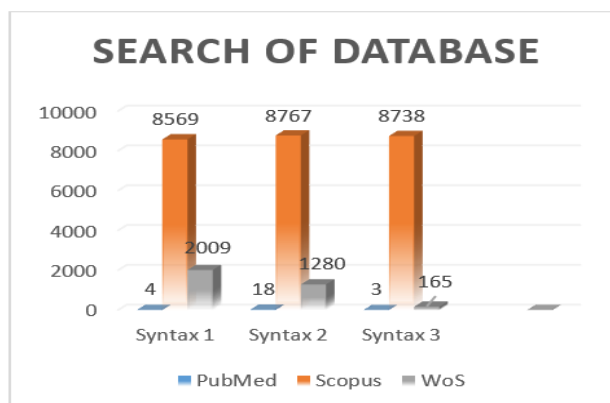


Figure 1. Graphic representation of search database according to the syntax 1 to 3 with different search engine.

Inclusion and Exclusion Criteria

The study requires English-language communication, full-text papers published between 2019 and 2023, and research on online learning platforms' impact on nursing education outcomes. Exclusions include non-English, older than 2019, and grey articles.

Study Selection

Data search involves identifying, monitoring, maintaining, formulating, and synthesizing concepts. It begins with study selection and search engine identification using inclusion and exclusion criteria. Databases, search engines, and literature libraries are used.

Table 3. Selected Studies for SR (Systematic Review)

No	Author	Research	Year
1	Alqahtani et al.	Virtual education during COVID-19: Exploring factors associated with e-learning satisfaction among Saudi nursing students.	2021
2	Castro et al	Nursing educators' and students' perspectives regarding online learning during the pandemic in Saudi Arabia	2022
3	Diabe et al.	E-learning during COVID-19 pandemic: Obstacles faced nursing students and its effect on their attitudes while applying it.	2020
4	Riaz et al.	Effects Of Online Learning Experience, Cognitive Presence And Psychological Well-Being Among University And College Students During Pandemic In Pakistan And KSA.	2022
5	Ahmed	Nursing students' satisfaction with online learning experiences during covid-19 pandemic at Albaha University, Saudi Arabia.	2022
6	Al Fajar	Coping Strategies and Their Influencing Factors Among Nursing Student in Online Learning	2023
7	Suliman et al.	Experiences of nursing students under the unprecedented abrupt online learning format forced by the national curfew due to COVID-19:	2021
8	Al-Mugheed et al.	Effectiveness of game-based virtual reality phone application and online education on knowledge, attitude and compliance of standard precautions among nursing students.	2022
9	Bdair	Nursing students' and faculty members' perspectives about online learning during COVID-19 pandemic: A qualitative study.	2021
10	Nyumirah,	Stress Level of Nursing Students During Online Learning During the Covid-19 Pandemic.	2022

Identification of studies via databases and registers

Quality evaluation is a systematic approach to assessing the quality of a study based on data from

peer-reviewed journals, total evaluation, and quality management. This thorough literature evaluation contains much information on research methodology and the study to exert pressure lies.

Identification of Studies via Database

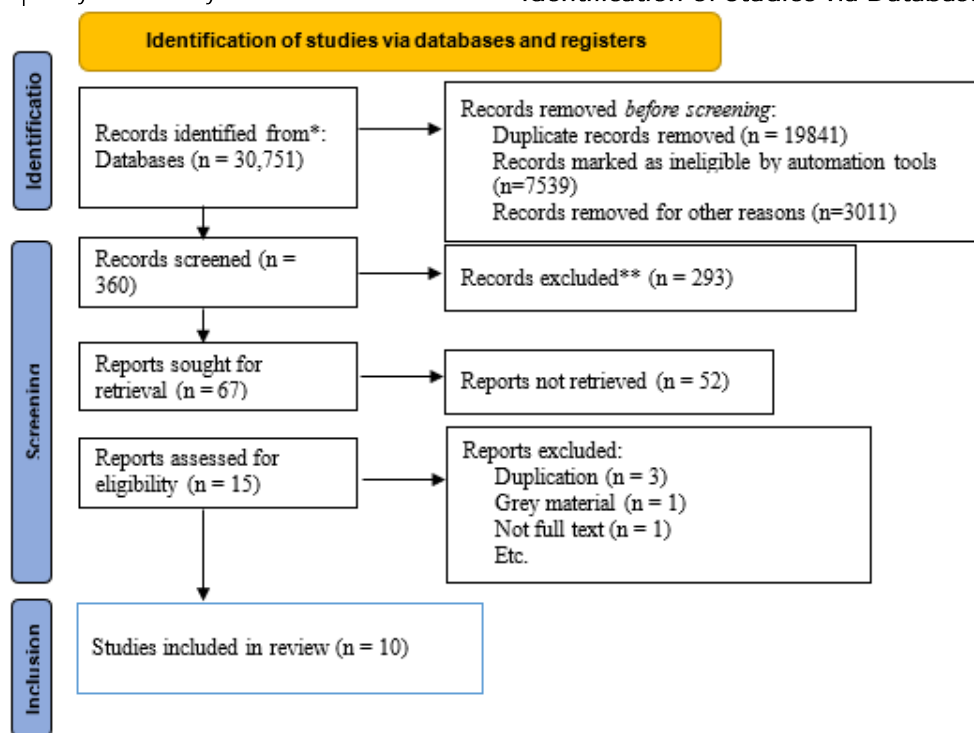


Figure 2. Identification of Studies via Database

Data Extraction

The data was extracted using a tool with specific inclusion and exclusion criteria, including study characteristics, participant characteristics, measures

used to assess online learning platforms' impact on nursing education, and key findings related to online learning platforms and their outcomes in nursing education.

Table 4. Research Matrix

Author, Year	Aim of study	Methodology	Sample	Setting	Result
Alqahtani, N., Innab, A., & Bahari, G. (2021).	The purpose was to determine factors associated with students' satisfaction with e-learning among Saudi nursing students.	A cross-sectional, correlational descriptive stud.	139 nursing students from different nursing programs	Saudi Arabia	Previous experience with and readiness for e-learning influenced students' overall satisfaction with e-learning and satisfaction with assessment. Only readiness for e-learning was associated with satisfaction with teaching and generic skills and learning experiences.
Castro, G. M. T., Taala, W. D., Guerrero, J. G., Rosales, N. S., De Sagun, R. S., Cordero, R. P., ... & Javines, R. G. (2022).	The study aimed to determine nursing educators' and students' perspectives concerning the shift of teaching methodologies to online learning platform in nursing education during the COVID-19 pandemic.	The cross-sectional study investigated nursing educators' and students' perspectives on online learning. who answered the Test of e-Learning Related Attitudes scale. The data collection was conducted from November to December 2020	Non-probability convenience sampling technique was used to recruit 120 educators and 350 students,	5 selected colleges and universities in	The findings of the study revealed that the overall mean score of the nursing educators' perspectives on online learning based on the 4 dimensions were 4.18 with a SD of 0.57 and an overall mean score of 4.22 with a SD of 0.61 for the students. Furthermore, the perspectives of both participant groups on challenges and benefits dimensions shows that there was significant difference as supported by a p-value of <0.001 and 0.046. However, it shows in the attitude and interest dimensions that there was no significant difference as supported by a p-value of 0.313 and 0.088, respectively.
Diab, G. M. A. E. H., & Elgahsh, N. F. (2020).	To investigate the effect of obstacles faced nursing students on their attitudes towards e-learning while applying it during COVID-19 pandemic.	Descriptive correlational research design. Interviewing questionnaire, attitude towards e-learning scale, and obstacles of e-learning questionnaires.	A stratified random sample technique was employed for the selection of 30% from the students in each of the four academic years enrolled in Faculty of Nursing, Menoufia University during the academic year 2019/2020	In Faculty of Nursing, Menoufia	The results revealed that overall, 61.6% of students had negative attitudes towards e-learning. There was the highest level of total obstacles present among academic students in the first year were (67.6%) and the lowest level of total obstacles present among academic students in the fourth year was (55.7%) that faced nursing students during using e-learning. the most common dimensions of obstacles to e-learning were infrastructure and technology, technical and management support, and instructors' characteristics.
Riaz, A., Zaman, K., Safdar, T., Shahbal, S., Alsolami, A. R., Alfi, E. A. M., & Alamrani, A. H. (2022).	To study the relationship between online learning experience, cognitive presence and psychological well-being among university and college students during covid-19 pandemic.	Online learning scale (Bernard et al., 2004), community of inquiry (Arbaugh et al., 2008) and psychological well-being scale (Ryff, 1989) were used for the collection of data from students including both males and females.	The target population was students with the age range of 17-27 years. The study was conducted by using purposive-convenient sampling technique (N = 283).	In Pakistan And KSA	The results of the present study showed that online learning experience has a positive relationship with community of inquiry. Teaching presence, social presence and cognitive presence are significantly positively correlated with each other. Community of inquiry shows significant positive relation with online learning experience and they both shows significant negative relation with psychological well-being.
Ahmed, W. A. (2022).	To assess nursing students' satisfaction with online learning during the pandemic.	This is a descriptive cross-sectional study; it was conducted among nursing students during the COVID-19 pandemic. The authors used an adopted online questionnaire to assess students' satisfaction. The data were analysed by SPSS software.	The study found that nursing student's age was mainly between 22-24 years (78.9%), both male (46.1%) and female (53.9%) students.	Albaha University, Saudi Arabia	Nursing students' satisfaction with online learning during COVID-19 was moderate (23.68%) to high (64.47%). A significant relationship was observed between student's age and sex with satisfaction levels in online learning with a p-value less than 0.05.

<p>Al Fajar, M. G., Fitriya, N., Senjaya, S., & Karisa, P. (2023).</p>	<p>To identify a description of the coping strategies used by students of the Faculty of Nursing, Universities Padjadjaran in carrying out online lectures and the factors that influence them</p>	<p>This research was a cross sectional design. The instrument used is The Brief COPE questionnaire with 28 statement items, and questionnaire on factors that affect coping strategies with 40 statement items, then analysed descriptively.</p>	<p>The population in this study was students of the Faculty of Nursing, Universities Padjadjaran with a total sample of 271 students who were selected based on the proportional stratified random sampling technique.</p>	<p>In KSA</p>	<p>The results of the study showed that almost all respondents, namely 208 students (76.75%) had problem focused coping strategies. Problem solving skills are the highest factor in the use of coping strategies with a mean value of 0.8413 and physical health being the lowest factor with a mean value of 0.3210.</p>
<p>Suliman, W. A., Abu-Moghli, F. A., Khalaf, I., Zumot, A. F., & Nabolsi, M. (2021).</p>	<p>To investigate the experiences of undergraduate nursing students during their first uses of OL to increase the understanding of their encountered opportunities and challenges.</p>	<p>A descriptive qualitative design guided by a phenomenological approach was used. Data were collected using two focus group discussions, and the discussions with participants were audio/video recorded through the online platform Zoom due to the national imposed curfew. Content analysis employed Colaizzi's steps to derive the themes/categories.</p>	<p>The study used a purposive sampling technique to recruit 18 undergraduate nursing students from two universities.</p>	<p>In KSA</p>	<p>The study revealed four themes: experience of helplessness, burdens, and burnout; the need for social and technical support to manage OL; the propensity to consider OL as a positive opportunity; and the deficiency of OL in fulfilling the educational outcomes of clinical courses.</p>
<p>Al-Mugheed, K., Bayraktar, N., Al-Bsheish, M., AlSyouf, A., Aldhmadi, B. K., Jarrar, M. T., & Alkhazali, M. (2022).</p>	<p>To determine the effect of online education and game-based virtual reality phone applications related to standard precautions.</p>	<p>Experimental study. Students were divided randomly into two groups; the experimental group used online education and game-based virtual reality phone applications, while the control group used traditional education.</p>	<p>126 nursing students' from the third and fourth nursing levels</p>	<p>In KSA</p>	<p>The results showed that the knowledge of, attitudes towards, and compliance with standard precautions differed between the two groups. The performance of the experimental group of nursing students significantly improved with online instruction and game-based virtual reality phone applications. This study demonstrated the effectiveness of online education and game-based virtual reality phone application among nursing students.</p>
<p>Bdair, I. A. (2021).</p>	<p>This study aims to explore the nursing students' and faculty members' perspectives of online learning during the COVID-19 era.</p>	<p>This qualitative study was conducted using a descriptive-phenomenology method.</p>	<p>Data were collected in August 2020 using a purposive sampling method and telephone semi-structured interviews based on the real-life experience of nursing students and faculty members with online learning during the COVID-19.</p>	<p>In KSA</p>	<p>The results revealed three themes for advantages, four themes for challenges, and four themes for recommendations. The advantages themes include a flexible learning environment, academic achievement, and student-centered learning. The challenges themes were inadequacy, academic integrity, learning environment, and family burden. The themes for recommendations were training, teaching, assessment, and quality monitoring.</p>
<p>Nyumirah, S. (2022).</p>	<p>All students and educators who implement the learning process require time for the adaptation process in its application.</p>	<p>Quantitative descriptive</p>	<p>Sampling of 140 samples but 2 people refused because they were not willing to fill out the questionnaire</p>	<p>In KSA</p>	<p>The results showed that most of the female respondents (84.8%), with an average age (20 years: 28.98%) with a high level of stress experienced by students experienced moderate stress (86.95%).</p>

Quality Assessment

The included studies' methodological quality and bias risk were evaluated using relevant quality

assessment tools adapted to various study designs. This process ensured that the research was a compact and trustworthy source of knowledge.

Table 5. Assessment of the literature quality matrix

Sr #	Author	Are the selection of studies described appropriately	Is the literature covered all relevant studies	Does the method section describe?	Were findings clearly described?	Quality rating
1	Alqahtani et al.	Yes	Yes	Yes	Yes	Good
2	Castro et al	Yes	Yes	Yes	Yes	Good
3	Diabe et al.	Yes	Yes	Yes	Yes	Good
4	Riaz et al.	Yes	No	Yes	Yes	Good
5	Ahmed	Yes	Yes	Yes	Yes	Good
6	Al Fajar	Yes	Yes	Yes	Yes	Good
7	Suliman et al	Yes	Yes	Yes	Yes	Good
8	Al-Mugheed et al.	Yes	Yes	Yes	Yes	Good
9	Bdair	Yes	Yes	Yes	Yes	Good
10	Nyumirah	Yes	Yes	Yes	Yes	Good

The systematic review of studies provided clear descriptions, methods, selection processes, literature coverage, and clear conclusions, resulting in a "Good" rating for their quality.

The following sub-themes have been observed among the studies, including in the systematic review.

3. Results

Table 6. Themes and Sub-themes for the Results of the Systematic Review:

Themes	Sub-themes
1	Dissatisfaction with online learning platform
2	Nurses have different perspective about Online learning platforms
3	Nurses 'attitude link the outcomes of online learning platform
4	Psychological well-being link with positive impact and outcomes of online learning platform
5	Depressiveness and hopelessness link with the ambiguity in studies during online learning platform
6	Supportive educational environment needed during online leaning

4. Discussion

The majority of students, including first-year students, expressed dissatisfaction with their education, with no significant difference between medical and nursing students. Faculty members who were supportive and responsive had the highest satisfaction score, while issues related to peer interaction had the lowest. Over 660 opinions were provided, highlighting widespread dissatisfaction with practical and clinical learning (Dutta et al., 2021). Studies show insecurity among online learners due to technological issues, internet issues, and inadequate audio-visual transmission. Hands-on practical learning and clinical placements are crucial in professional courses, but conventional lectures may not be necessary (Singh et al., 2020).

Moreover, nurses have different perspective regarding the online learning platforms in education. According to the findings of the systematic study, E-learning is an excellent tool for integrating information with practice and encouraging professional growth among Registered nurses in healthcare settings. However, Registered nurses may lack enthusiasm to participate in E-learning and may experience difficulties with user-friendly systems (Alfaleh et al., 2023).

A survey of more than 500 responses from radiography, nursing, medical laboratory sciences,

pharmacy, and physiotherapy disciplines revealed a 76% response rate. Smartphones were preferred for online access, with Zoom being the most used platform. Despite online learning being more comfortable, 48% of respondents had negative perceptions of practical subjects. Challenges faced included poor internet connections and lack of electronic devices (Chandrasiri & Weerakoon, 2022). Nursing students showed a modest level of dependence on technology and a somewhat positive attitude toward e-learning. Learners' dependence on technology and views toward e-learning were revealed to have a statistically significant positive association. Identifying nursing how well pupils are doing of technology addiction and attitudes towards e-learning aids nurse educators in establishing curriculum and e-learning in this area (Guyen Ozdemir & Sonmez, 2021).

Psychological disturbance also experienced by the nurses students during online learning. The survey revealed that nursing students experience moderate stress, anxiety, and depressive disorders, strongly linked to demographic, disease-related, and online learning characteristics. Further research is needed for professional psychological assistance and teaching strategies (Rayan, 2023). Also, academic stress and COVID-19 anxiety negatively impact quality of life and resilience. Resilience, on the other hand, positively

impacts quality of life and mitigates the impact of academic stress. Resilience significantly mediates the relationship between academic stress and quality of life, as demonstrated by a reduction in COVID-19 anxiety among nursing students (Berdida & Grande, 2023).

Limitation

This systematic review is limited by the risk of publication bias because only published studies were included. This may result in the removal of unreported or grey material that may lack information concerning the outcomes and effect of online learning platforms.

Suggestions

Future study could involve using unpublished information and research from government-run and a nonprofit groups, as well as engaging subject-matter experts, to reduce this limitation. While participating in online learning, it is also recommended to identify the aspects linked with psychological wellness as well as educational challenges.

5. Recommendations

It is recommended to explore factors associated with the students dissatisfaction with the online learning platforms also negative perspective about it outcomes. It is also recommended to identify the common themes among the nursing students who experience psychological disturbance during online learning.

6. Conclusion

On the basis of systematic review, it is identified the six themes which are as dissatisfaction with online learning platform; Nurses have different perspective about Online learning platforms; Nurses' attitude link the outcomes of online learning platform; Psychological well-being link with positive impact and outcomes of online learning platform; Depressiveness and hopelessness link with the ambiguity in studies during online learning platform and Supportive educational environment needed during online learning. It is concluded that impact and outcome of online learning platforms in nursing education have both negative and positive which is depend on the students' attitude, perception, psychological well-being and environmental support.

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