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Effectiveness of Utilizing an Evidence-Based Clinical Skill Platform in Critical Care Nursing Course: A Quasi-experimental Study

Leena Khonji[1], Aida Alqarni[2], Enas Bassuni[2], Kawther Ahmed[2], Marwan Altheeb[1], Zohour Rashwan[1,3], Magda Bayoumi[1,4]

[1] Department of Nursing, College of Health and Sports sciences, University of Bahrain, Bahrain.
[2] Nursing College, King Khalid University, Abha, Saudi Arabia.
[3] Pediatric Nursing Department, Faculty of Nursing, Alexandria University, Egypt.
[4] Medical Surgical Nursing, Faculty of Nursing, Beni-Suef University, Egypt.

Abstract:

Background: In today's nursing education, incorporating innovative teaching pedagogies is highly valued, including the utilization of online clinical skills platforms. This study compared the effectiveness of the Clinical Skills platform, an evidence-based e-learning tool, with traditional face-to-face lab demonstration sessions. **Methods**: A quasi-experimental research study was conducted in the Nursing College, King Khaled University, Kingdom of Saudi Arabia. A convenient sample of 50 students enrolled in the critical care nursing course were divided into two groups: the intervention group utilized the Clinical Skills platform, while the control group received face-to-face lab sessions. Pre-posttest knowledge test for 10 skills were done. Objective Structured Clinical Evaluation (OSCE) were conducted to evaluate skill acquisition as well. **Results:** A significant improvements in students' knowledge regarding the ten critical care nursing skill practices as p-value ranged from p=0.042 to p<0.001. Additionally, the intervention group obtained higher percent scores in the OSCE 96% compared to in 80% the control group. Students reported a positive perception of the usability of clinical skill platforms where 84% of the students agreed or strongly agreed that incorporating the Clinical Skills platform was beneficial for their learning experience. **In conclusion**, these findings support the idea that innovative teaching pedagogies, such as the Clinical Skills platform, enhance the effectiveness of clinical nursing education. This comprehensive and user-friendly platform promotes skill development, active learning, and improved student performance in critical care nursing.

Keywords: Education, Distance, Nursing, Baccalaureate, Clinical Competence, Skilled Nursing Facilities

INTRODUCTION:

In a world grappling with a global health crisis of unprecedented proportions, the COVID-19 pandemic has caused a sudden disruption in nursing education. Higher educational institutions are now racing to adapt their curricula and find innovative ways to meet the students' evolving needs, especially in the nursing field (Tian et al, 2020). This has led to a renewed focus on online learning and blended learning approaches, aiming to optimize student learning outcomes (Poon.,2013; Kiviniemi., 2014).

Remote learning is considered a promise alternative in nursing education, particularly in the face of traditional face-to-face teaching methods. Supporters argue that context-based learning through technology can greatly enhance learners' knowledge construction, transfer, and application (Porter et al, 2013). However, the nursing profession, which heavily relies on practical experience, faces a significant challenge in transitioning to online learning, especially in light of the COVID-19 pandemic (Pawlyn, 2014).

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Nursing schools have had to quickly adapt their learning and teaching strategies, implementing virtual Objective Structured Clinical Evaluation (OSCE), utilizing clinical skill platforms, case studies, and clinical concept maps (Choi et al, 2010). The interruption in the study plan has the potential to impact students' future as registered nurses, making it crucial to find effective alternatives (Intachai, 2014).

The transition from face-to-face to online teaching requires the design of a new learning environment, taking into consideration modifications to learning outcomes, technical challenges, and the beliefs of faculty and students regarding the effectiveness of online teaching and learning strategies (Dewart et al, 2020). Applying adult learning principles can actively engage students and foster critical thinking and problem-solving skills (Maggio et al, 2018). By designing authentic and attractive learning resources based on a problem-solving approach and case-based learning, the online learning environment can enhance the learning process and promote active participation (Anderson, 2008; Zepke, 2010).

Numerous studies have highlighted the importance of online learning in nursing education, emphasizing its contribution to effective pedagogy and the development of students' self-learning abilities (Zepke, 2010, Vaughan et al, 2013; Sin et al, 2017; McCutcheon et al, 2018). It has inspired faculty members to be creative in delivering their courses and achieving desired learning outcomes. Online courses offer students the flexibility to learn without time or place restrictions, although challenges related to technology and accessibility need to be address (Luo & Kalman et al, 2019).

In the realm of nursing education, a clinical skills platform presents an innovative and evidence-based e-learning solution that creates a safe and effective learning environment (Anderson, 2008). Nursing schools that have adopted clinical skill platforms have found them to be instrumental in addressing various challenges during clinical training and believe that such platforms will play a vital role in future clinical nursing education, enabling the achievement of core competencies (Vaughan et al, 2013).

In light of these considerations, the present study aims to investigate the effectiveness of utilizing an online clinical skill platform in nursing education. By exploring the impact of this platform on student learning outcomes, the study seeks to contribute to the ongoing efforts to enhance nursing education and equip future nurses with the necessary skills and competencies.

Methods

Study design and participants

A quasi-experimental, two-group pre-posttest study was carried out in 2021 at Nursing College, Kingdom of Saudi Arabia. Epi info program version 10 was used to estimate the sample size using the following parameters; population size of 60, Confidence coefficient of 95%, expected frequency of 50%, and acceptable error of 5%. The minimum sample size required was 52 students. A convenience sampling of 50 out of 52 critical care nursing courses who meet the inclusion criteria comprised the study subjects; had passed the pre-requisite courses successfully registered for the first time in a critical care nursing course, willing to study using an online clinical platform and have computer skills and access to the internet were included in the study while those students who repeated the course were excluded (n=8). The eligible students were randomly assigned to two equal groups; the control group in the Skill Clinical Lab Session (25 students), while the second group represented an intervention group who were utilizing the Clinical Skill Platform (25 students) as illustrated in Figure 1. The random allocation of eligible students was implemented by assigning one student to the intervention group while assigning the next one in the class list to the control one.
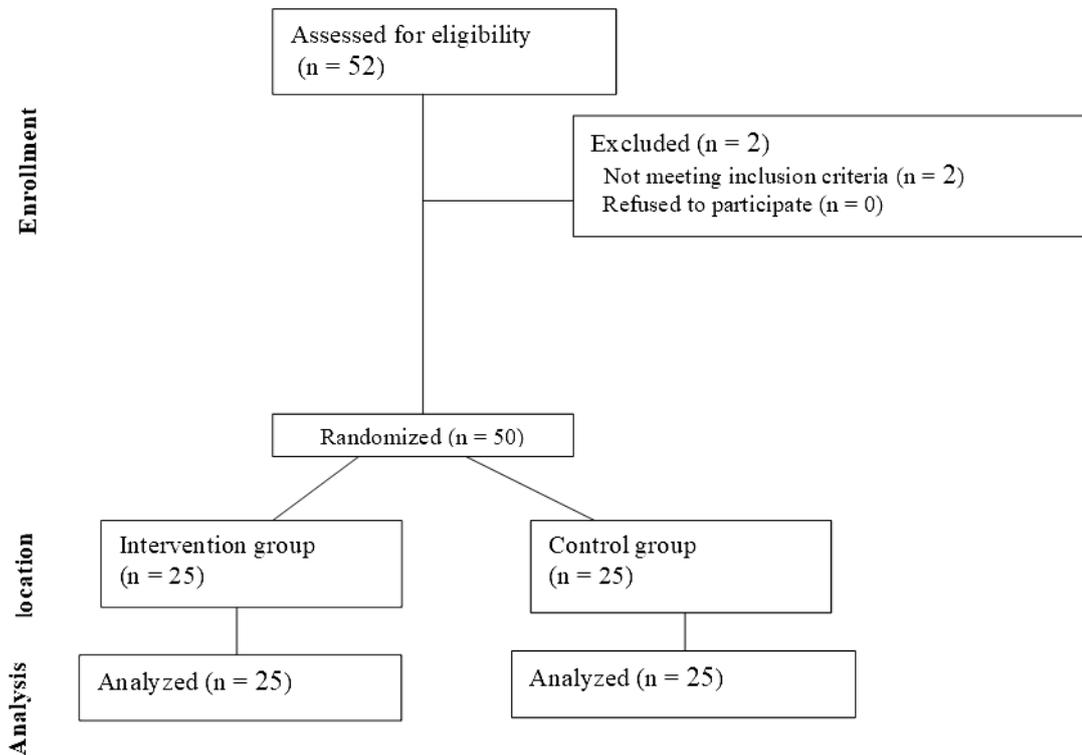
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FIGURE 1: Flowchart of participants' recruitment process.

Measurement:

Tool I: Critical Ill Patients' Nursing Care Observational Checklists

This tool was developed by the researcher after thorough review of related literature to assess the students' skills in providing nursing care for critically ill patients (Clinical The checklist included that covered ten nursing skills; ABGs Sampling (14 items), Arterial Blood Gases (ABGs) Interpretation (18 items), Central Venous Catheter (CVC) Insertion (assisting) and Monitoring (13 items), CVC Maintenance & Dressing Change (22 items), ECG: 12 Lead & Interpretation (24 items), Electrocardiography (ECG): Right Precordial and Left Posterior Leads (22 items), Pulmonary Artery Catheterization (PAC) Insertion (Assisting) and Monitoring (18 items), Chest Tube: Closed Drainage System Management (Monitoring & Caring) (29 items), Suctioning: Oropharyngeal, Endotracheal Tube and Tracheostomy Tube Suctioning (30 items), Mechanical Ventilation: Volume and Pressure Modes (31 items). The students' skills were scored one for the steps that have been done complete and correct while zero score was given for the steps that have been done incorrect, incomplete or not done. The total score was summed up and the percent scores were calculated by dividing the obtained total score on the maximum score of each skill.

Tool II: Critical Care Nursing Practice Knowledge Test:

This tool was developed by researchers to assess the students' knowledge regarding the critical nursing skills under the study. The test included 10 quizzes each one had 10 Multiple Choices (MCQs) for each skill. These skills included ABGs Sampling, ABGs Interpretation, CVC Insertion and Monitoring, Central Venous Catheter, Maintenance & Dressing Change, ECG: 12 Lead & Interpretation, ECG: Right Precordial and Left Posterior Leads, PAC Insertion (Assisting) and Monitoring, Chest Tube: Closed Drainage System Management (Monitoring & Caring), Suctioning: Oropharyngeal, Endotracheal Tube and Tracheostomy Tube Suctioning, Mechanical Ventilation: Volume and Pressure Modes.

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Tool III: Assessment of Students' Perception of Usability and Learning of the Clinical Skill Platform

This questionnaire was developed by Rowe et al., (2018). It included eight questions divided into two major themes: the first theme is relevant to the platform's usability (4 items) and second theme reflects the Learning enhancement while using the platform (4 items). Each item was scored on a three-point Likert scale as follows: Strongly agree or agree (3), Neither agree nor disagree (2), and strongly disagree or disagree (1). The overall perceptions of students with both online and traditional lab experiences included, and scores ranged between (1-3) 1= Much better than or better than, 2= About the same as 2, Much worse than or not as good as 3. The total Score ranges from 8 to 24 where the higher the score reflects the higher perception of usability and learning of the online skill platform.

Content Validity

The three tools were submitted to a panel of 7 experts in critical care nursing, medical-surgical nursing and nursing education to assess the content validity. The results from the panel of experts yielded 0.94 for the checklist. The experts also agree upon the content of Tool II as the Item Content Validity (I-CVI) ranged from 0.88-1. Besides, Tool III was valid as the Scale content validity index (S-CVI) was 0.93 for relevancy and 0.92 for clarity.

Pilot Study and Reliability Testing of the study Tools

A pilot study was done on 42 senior nursing students. Those students are excluded for the study sample. Regarding Tool I, two raters (demonstrators) were trained to assess students' performance using the standardized checklists. Both raters independently recorded their observations of the student's performance using the checklists. The Intraclass Correlation Coefficient (ICC) revealed P-values above 0.82 for all checklists' procedures, reflecting a good agreement among the raters and the internal consistency, the alpha coefficient was 0.86. Moreover, the Cronbach's alpha coefficient was 0.89 for Tool II and 0.93 for Tool III.

Data collection Procedure:

Pretest

Initially, students of both groups were assessed for their Sociodemographic and academic characteristics such as age, gender and Cumulative Grade Point Average (CGPA). Moreover, they were asked to complete the Critical Care Nursing Practice Knowledge quiz offered on the Blackboard just before each training session (either through skill lab demonstration or through the Skills online Platform session) to evaluate their baseline data.

Control Group

Students received the routine teaching technique in nursing skill laboratories focused on establishing core skills. The teacher initially demonstrated the steps of clinical skills in front of students. Then, they were allowed for redemonstration under the supervision and guidance of the faculty at a time and sign off on checklists at the end of the clinical day.

Intervention Group

During the orientation session, students were informed about the clinical content scope of practice and the group distribution. The study was conducted in three phases: preparatory phase, implementation phase, and evaluation phase.

Preparatory Phase: the researchers provided the students an online training session to orient them about the contents of the platform after receiving their username and password. Then, the researchers assigned the clinical modules (10 scopes of practices) for students one day before the scheduling the skill lab session.

Implementation Phase: The researchers equipped students with the list of the required procedures namely; (1) Arterial Blood Gas Sampling, (2) Arterial Blood Gas Interpretation, (3) Central Venous Catheter Insertion (Assisting) (4) Central Venous Catheter: Maintenance and Dressing Change, (5) Electrocardiogram: 12 Lead, (6) Electrocardiogram: Right Precordial and Left Posterior Leads(7) Pulmonary Artery Catheter Insertion (Assisting) and Monitoring, (8) Chest Tube: Closed Drainage System Management, Monitoring and Caring, (9) Suctioning:

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Oropharyngeal, Endotracheal Tube and Tracheostomy Tube Suctioning, and (10) Mechanical Ventilation: Volume and Pressure Modes. The researchers asked students to review the required skills on the skill platform i.e., watching the demonstration videos, read the background information such as the quick sheet and the extended sheet. The researchers scheduled a 10 free lab session in the nursing laboratories, assembled all the needed equipment and were available to clarify any doubts and answer students' questions. During the free lab sessions, the researchers divided the students into subgroups (5 each) and asked them to practice the skills as per the online platform while the researchers acted as resource person who facilitated the training sessions.

Evaluation Phase:

Immediately after each session, students of both groups were asked to complete the relevant knowledge quiz on the Blackboard. At the end of the semester, students of both groups were scheduled for OSCE.

The researchers prepared the three clinical scenarios to be utilized in the OSCE and instructed the students to perform the required skill on the mid-fidelity manikin as shown in Table I. In the practical station, the researchers instructed students to read the patients' files within 2 minutes, receive handover from the instructor within 3 minutes as well as they allowed to perform the required skills within 20 minutes and the last 5 minutes for reflection. The researchers evaluated the students' performance against the standardized checklist. Then, the students were instructed to move to answer the test in the written station where the questions were prepared to cover the relevant clinical objective based on Bloom's taxonomy. According to Exam Policy and Procedure, students should pass the practical station (100%), as well as the relevant written station (70%), to achieve a pass in that scope of practice skill. Those who failed in the practical exam were scheduled for re-site exam

Table 1: The structure of the OSCE

No.	Stations Scenario	Areas of Assessment (Skills)		Methods Students' Assessment	Time allotted
1	Coronary artery bypass grafting (CABG)	a. b.	Chest Tube Oropharyngeal, ETT Suctioning	Practical Exam Written quiz	30 minutes
2	An ST-elevation myocardial infarction (STEMI)	a. b. Change	ECG (12 Leads +Interpretation) CVC: Maintenance and Dressing	Practical Exam Written quiz	30 minutes
3	Stroke	a. b.	ABGs Interpretation 2-Assess GCS.	Practical Exam Written quiz	30 minutes

Ethical Consideration:

 Formal letters were issued from the investigators to the Dean College of Nursing, and approval was obtained from the Ethical Committee of the Nursing College, King Khaled University (234-1-1-2021). Agreement to utilize and evaluate the effectiveness of the clinical skill platform as a clinical nursing education teaching strategy in the clinical critical nursing care course was obtained from the responsible authorities (ClinicalTrials.gov Identifier: NCT04977921). Information about the study was given to all students to ensure a clinical teacher's protection of human rights. Verbal informed consent was obtained from students after explaining the purpose of the study. Moreover, the participants in the intervention group were informed that they had full right to switch to the traditional clinical lab session teaching strategy at any time without affecting their course evaluation. However, to ensure students in the control group were exposed to the same learning experience, they were assigned to the clinical skill modules after completing the study. Doubtless, the confidentiality of the obtained data was confirmed, and participants' learning experience satisfaction anonymously was collected.

Data analysis

 The Statistical Package for Social Sciences (SPSS) version 25 was utilized for data analysis. Data is presented using descriptive statistics in the form of frequencies, means, and standard deviations for quantitative variables in

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tables and charts. The data was tested for (U) was used to determine the relationship between critical care nursing practice mean scores knowledge regarding 10 scopes of practices. Statistical significance was considered at p-value <0.05.

RESULTS:

The demographic characteristics of students in the study sample are described in Table 2. Students' age for both groups ranged between 21-24 years, with a mean of 22.2 ± 0.57 for the Clinical Skill Platform (CSP) group and the Clinical Skill Lab (CSL) group of 22.08 ± 0.57. More than half of the students have had a Grade Point Average (GPA) of more than 4 for both groups; as for pre-requisite courses, both groups completed Medical-Surgical Nursing I (NURS 313) and Medical-Surgical Nursing II (NURS 321).

Table 2: Sociodemographic and Academic Characteristics **of nursing students**

Characteristics	Clinical Skill Lab (CSL) Group	Clinical Skill Platform (CSP) Group
	n= 25 (%)	n= 25 (%)
Age (Years)		
21	2 (8%)	1 (4%)
22	20 (80%)	19 (76%)
23	2 (8%)	4 (16%)
24	1 (4%)	1 (4%)
Min-Max	21-24	21-24
Mean (SD)	22.08 ± 0.57	22.20 ± 0.57
Gender (Female)	25 (100%)	25 (100%)
GPA		
< 3	4 (16%)	2 (8 %)
3- 4	5 (20%)	9 (36%)
> 4	16 (64%)	14 (56%)
Mean (SD)	2.48 (0.77)	2.48 (0.65)

Table 3 illustrates the pre- post-test scores of 10 scopes of practices as assessed among both study groups. Obviously, the post-test scores are improved in the CSP Group. The difference is statistically significant compared to the post-test of CSL Group in all scopes of practices as ABG Sampling ($p=0.004$), ABGs Interpretation ($p<0.001$), CVC Insertion (assisting) and Monitoring ($p<0.001$), CVC Maintenance & Dressing Change ($p=0.035$), ECG: 12 Lead & Interpretation ($p=0.002$), ECG: Right Precordial and Left Posterior Leads ($p=0.023$), PAC Insertion (Assisting) and Monitoring ($p=0.008$), Chest Tube: Closed Drainage System Management: Monitoring & Caring ($p=0.042$), Suctioning: Oropharyngeal, Endotracheal Tube, and Tracheostomy Tube Suctioning ($p=0.038$), Mechanical Ventilation: Volume and Pressure Modes ($p=0.002$) and for total scope of practices score post-intervention ($p<0.001$).

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Table 3: Comparison between Critical Care Nursing Practice mean Scores Knowledge regarding 10 scopes of practices among both study groups at **Pre- post-test**

Scope of practice	Pre-test			Post-test		
	CSL Group	CSP Group	P-value	CSL Group	CSP Group	P-value
	Mean ±SD	Mean ±SD		Mean ±SD	Mean ±SD	
1. ABGs Sampling	2.20±0.76	2.12 ±0.72	0.351	6.52 ±1.04	8.44 ±0.96	0.004[b]
2. ABGs Interpretation	0.92 ±0.64	1.44 ±0.82	0.076	5.32 ±0.98	7.28 ±0.79	<0.001[c]
3. CVC Insertion ±assisting and Monitoring	2.48 ±0.87	2.24 ±0.87	0.631	6.36 ±0.63	8.20 ±0.91	<0.00[c]
4. CVC Maintenance & Dressing Change	2.52 ±0.96	3.24 ±0.66	0.063	7.4 ±0.65	8.52 ±0.65	0.035[a]
5. ECG: 12 Lead & Interpretation	1.04 ±0.61	1.32 ±0.55	0.423	6.80 ±0.81	8.20 ±0.76	0.002[b]
6. ECG: Right Precordial and Left Posterior Leads	1.12 ±0.66	2.92 ±0.70	0.046	7.44 ±0.96	8.52 ±0.58	0.023[a]
7. PAC Insertion ±Assisting and Monitoring	1.52 ±0.91	1.40 ±0.50	0.456	6.00 ±0.70	7.88 ±0.78	0.008[b]
8. Chest Tube: Closed Drainage System Management ±Monitoring & Caring	1.28 ±0.67	2.60 ±1.22	0.045[a]	6.24 ±0.77	8.04 ±1.01	0.042[a]
9. Suctioning: Oropharyngeal, Endotracheal Tube and Tracheostomy Tube Suctioning	2.06 ±0.95	2.36 ±0.95	0.128	7.20 ±0.86	8.08 ±0.95	0.038[a]
10. Mechanical Ventilation: Volume and Pressure Modes	0.88 ±0.60	0.96 ±0.67	0.681	5.40 ±0.95	7.48 ±0.71	0.002[b]
Total scope of practice	18.40 ±2.25	19.28 ±2.31	0.527	64.72 ±2.42	80.64 ±2.89	<0.001[c]

Z^{MW}: Mann Whitney Test   **Significant at**   [a]**P≤0.05**   [b]**P<0.01** [c]**P<0.001**

FIGURE 2 presents the effectiveness of utilizing different teaching lab pedagogy on summative OSCE scores in both study groups, whereas the percentage of successful students in the CSP intervention group (96%) more than the successful percentage rate in the CSL group.
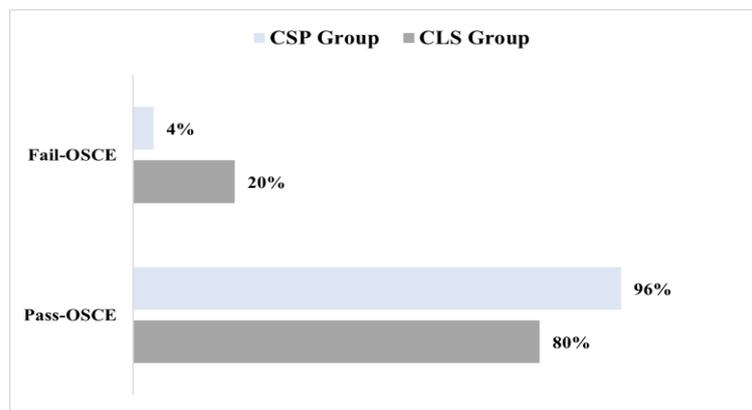
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FIGURE 2: The effectiveness of utilizing different teaching lab pedagogy on summative OSCE scores

FIGURE 3 demonstrates the student's perceptions of the intervention study group regarding the usability of the clinical skill platform, as most of the students agreed or strongly agreed to use such a clinical platform in clinical lab teaching. They highlighted that the clinical platform enhances their learning experiences.
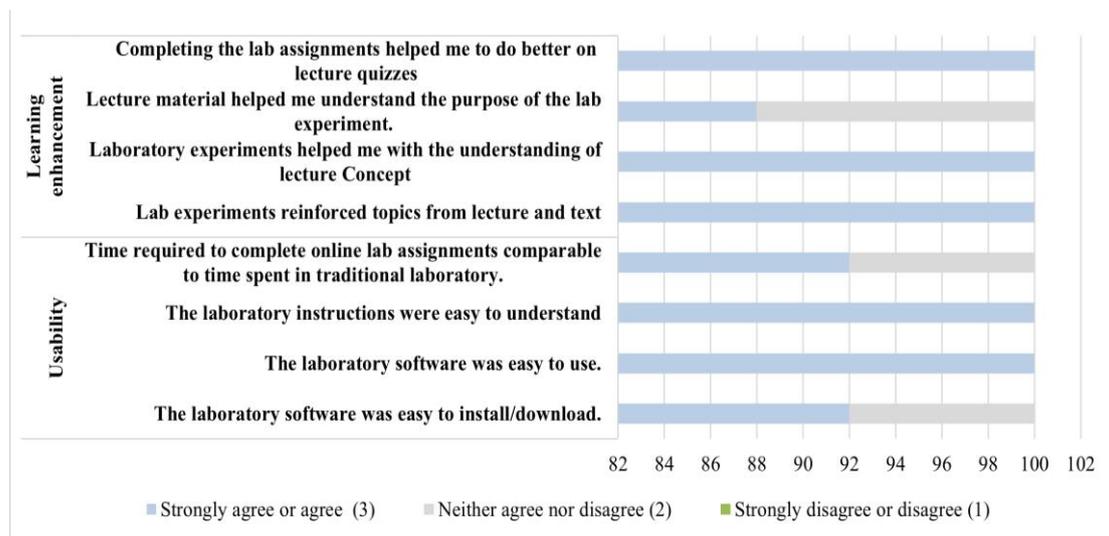

FIGURE 3: The student's perceptions of intervention study group regarding usability of clinical skill platform

The overall students' perception of both online and traditional lab experiences within intervention study group demonstrated in table 3 that around 84% of CSP group represents the experience was much better than or better than traditional classroom lab.

Table 4: Overall students' perception with both clinical skill platform and traditional clinical skill lab experiences

Question	Response	No. (%)
My online lab experience was _____my experience in a traditional classroom lab	Much better than or better than	21(84)
	About the same as	1(4)
	Much worse than or not as good as	3(12)

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DISCUSSION:

Nursing instructors in Saudi Arabia are primarily responsible for carrying out clinical education as well as theoretical teaching in the nursing school program, as in Turkey and many nursing schools (Logue etal, 2021). Dağ et al., 2019 reported that the most challenging issue identified by the most significant number of teachers was a severe teaching workload, insufficient instructors in institutions, excessive number of students, and insufficiently equipped laboratories to create a positive learning environment. As a result of these factors, nursing students graduate with a lack of knowledge and clinical experience. Unfortunately, clinical education issues negatively influence the nursing profession's aims and, as a result, directly impact public health (Dutta et al, 2021).

Pre-COVID-19 pandemic, the traditional face-to-face teaching approach was used in professional clinical nursing courses as a standard pattern teaching laboratory session to focus on skill demonstration and assure student engagement (Reglitz 2020). Post-COVID-19 era, many educational programs found an emerging to utilize technology to provide a big part of the solution and to play a significant role in the future of distance learning. Some proponents see technology as a panacea that has allowed vast parts of the industrialized world to work and learn remotely (Sinacori &Williams-Gregory, 2021). Indeed, the finding of the present study supports the utilization of online clinical skill platforms, which positively affect students' clinical performance.

A recent study highlighted that an online teaching pedagogy outperforms face-to-face training in terms of clinical skill development, and the use of the Internet to accomplish coursework is referred to as online education. Online teaching and learning have grown over the years to become an essential component of nursing education (Tahery, et al 211). In contrast, an evaluation of the effectiveness of utilizing online teaching on knowledge and clinical acquisition is highly recommended.

Dutta et al., 2021, investigated the satisfaction level of 1068 undergraduate medical and nursing students regarding utilizing online teaching during the COVID-19 pandemic with approximately a similar age range (54%) of the present study. On the other hand, the authors reported that online learning is vital in today's world, but it is not an efficient substitute for medical and nursing education. Practical lab sessions and face-to-face classes can be integrated with online learning approaches to empower the teaching pedagogy (Sinacori et al, 2021). Staykova et al. (2017) compared traditional and innovative teaching strategies in clinical nursing education and concluded that the satisfaction rate of students who were exposed to innovative teaching pedagogy in clinical education was statistically significant compared to those who were involved in face-to-face traditional lab sessions ($p > 0.013$). In disagreement with the present study finding, Gibson and Molloy highlighted that online learning is essential at current times but is not an effective alternative for medical and nursing education and emphasized that the combination of traditional face-to-face teaching with innovative teaching methodology creates an active learning environment (Gibson & Molloy, 2012).

The findings of several studies supported the present study results and indicated higher satisfaction with a positive perception towards online learning among the learners (Chan et al, 2017; El-Sayed & El-Raouf; 2019; Elarousy et al, 2014). Zhai et al., 2012 described that laboratory classes are held in real-world laboratory settings that would be impractical in the event of a pandemic like COVID-19. Nonetheless, virtual when students are not physically present, laboratories, remote control labs, or video-based labs are viable options on campus (Gamage et al, 2020). Virtual lab reality is utilized in clinical skills in remote laboratories. It allows students to conduct experiments through the internet. In contrast, video-based activities give a step-by-step skill overview of a real lab so that students may visualize the whole experimental procedure and its environment through video (Tabatabai, 2020), as utilized in the present study the clinical skill platform which provides each procedure the following sequence as skill quick sheet, extended sheet, illustration, list of equipment, checklist supported by animated step by step educational based video and creating online creative teaching environment based on evidence-based, learning anytime, and anywhere which can consider a valuable teaching pedagogy based on students pre-post test results and OSCE compared to traditional teaching strategy.

These preceding present study findings are those highlighted by Alkhowailed, 2020 that online learning has been a valuable tool for a long time. However, the education system has changed drastically with technological advances

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and easier ways to support teaching pedagogy. There has been an enormous rise in online learning via various digital platforms, proving that distance learning is viable (Alkhowailed et al, 2020). One of the assessments was conducted to identify the effectiveness of the teaching strategy on the post-test, as supported by McDaniel, Wildman, & Anderson, 2012 who reported that the pre-posttest practice is beneficial in both laboratory and classroom settings. In laboratory settings, a pre-testing effect has also been demonstrated with encouraging outcomes; when compared to no retrieval preparation, completing a test before being exposed to learning information improves retention (Little & Bjork, 2016). Moreover, using video-based learning enhanced the post-test score result. In agreement with the present study, Richland et al., 2009 studied the pre-test effects. They found that the majority of the participant's pre-test score results reported 95% wrong answers, and pre-test practice improved the learning experience. Meanwhile, Latimier et al., 2019 reported that the post-testing effect was substantially more significant than the pre-testing effect.

The previous, present study finding concerning the high results of OSCE after implementing the innovative clinical teaching methodology compared to the traditional method, which emphasized by Solà et al., 2017, the value of conducting an OSCE as a valuable assessment that reflects the level of students' performance based on the effectiveness of training laboratory sessions. The study findings established a new concept in clinical nursing education to achieve essential and valuable learning outcomes and confidently prepare nursing students for clinical practice.

In nursing clinical education, to overcome the challenges of utilization, the clinical skill platform provides a comprehensive online training program to paper nursing students who master practical skills across the entire clinical nursing curriculum and prepare them to enter the workforce with confidence. Ultimately, the clinical skill platform is a designed and structured tool based on evidence-based supported by videos and quizzes to give students a solid understanding of how skills are developed. Further research is recommended in many nursing schools with a larger sample of the population.

The study's limitations are that the sample size is considerably small and the study's setting came from only one university in KSA, which may have limited the feasibility of generalization of results to other universities. Therefore, future research should involve multisite analyses with a larger sample size in various geographic locations. Furthermore, the cost of adapting such a clinical platform should be considered based on the universities' budget.

CONCLUSION:

Post-COVID-19 pandemic, nursing education has been interrupted. The theory covered using online teaching effectively, but the clinical part was challenging. Consequently, the nursing schools adjust the clinical plan accordingly. In the present study, the utilization of an online clinical platform was a magic contingency plan to support students in clinical education and prepared them to pass the scope of practices post-test (Z^{WSR}=-4.377, p=0.000) and OSCE successfully (96%), and most of students were agreed or strongly agreed and support the usability of clinical skill platform in clinical lab teaching (84 %), these findings highlighted the utilization of such clinical platform should be constructed in the nursing curriculum to improve nursing students' performance in the clinical setting.

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