

Effect of Scenario Based Interactive Learning on Knowledge, Self Efficacy and Competency on Clinical Handover Among Student Nurses

Efecto del aprendizaje interactivo basado en escenarios sobre el conocimiento, la autoeficacia y la competencia en el traspaso clínico entre estudiantes de enfermería

Authors:

 Sogyal Khando

 Shasikala Venkat

Krupanidhi College of Nursing, India

Corresponding author:

Shasikala V

nursing.kric@krupanidhi.edu.in

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Effect of Scenario Based Interactive Learning on Knowledge, Self Efficacy and Competency on Clinical Handover Among Student Nurses

Efecto del aprendizaje interactivo basado en escenarios sobre el conocimiento, la autoeficacia y la competencia en el traspaso clínico entre estudiantes de enfermería

Abstract:

Clinical handover is vital for patient care. This study examined the effectiveness of scenario-based interactive learning in improving student nurses' knowledge, self-efficacy, and competency in handover. A true experimental design was conducted among 80 final-year nursing students who were randomly divided into two groups. The experimental group received a lecture followed by scenario-based learning and debriefing, whereas the control group received only a lecture. Validated tools were used to measure competency, self-efficacy, and knowledge. Descriptive statistics, paired and independent t-tests, ANCOVA, and Pearson correlation were used to analyze the data. The experimental group's knowledge and competency significantly improved as compared to the control group, according to the results ($p < 0.001$). Self-efficacy levels increased within groups, but after controlling for baseline values, there was no discernible difference across the groups. Knowledge and competency ($r = 0.476$) and knowledge and self-efficacy ($r = 0.362$) showed positive associations. An efficient teaching method for improving nursing students' clinical handover knowledge and proficiency

Resumen:

El traspaso clínico es fundamental para la atención del paciente. Este estudio examinó la efectividad del aprendizaje interactivo basado en escenarios para mejorar el conocimiento, la autoeficacia y la competencia de los estudiantes de enfermería en el traspaso clínico. Se llevó a cabo un diseño experimental verdadero entre 80 estudiantes de enfermería de último año, quienes fueron asignados aleatoriamente en dos grupos. El grupo experimental recibió una clase magistral seguida de aprendizaje basado en escenarios y una sesión de debriefing, mientras que el grupo de control recibió solo una clase magistral. Se utilizaron instrumentos validados para medir la competencia, la autoeficacia y el conocimiento. Se emplearon estadísticas descriptivas, pruebas t pareadas e independientes, ANCOVA y correlación de Pearson para analizar los datos. Los resultados mostraron que el conocimiento y la competencia del grupo experimental mejoraron significativamente en comparación con el grupo de control ($p < 0.001$). Los niveles de autoeficacia aumentaron dentro de los grupos, pero después de controlar los valores basales, no se observó una diferencia significativa entre los grupos. El conocimiento y la competencia ($r = 0.476$) y el conocimiento y la autoeficacia ($r = 0.362$)

is scenario-based interactive learning, which may also lead to better patient safety and communication procedures. An efficient teaching method for improving clinical handover knowledge and proficiency is scenario-based interactive learning.

Keywords: ISBAR, nursing handover, handoff, simulated learning, scenario-based.

mostraron asociaciones positivas. El aprendizaje interactivo basado en escenarios es un método de enseñanza eficaz para mejorar el conocimiento y la competencia de los estudiantes de enfermería en el traspaso clínico, lo que también puede contribuir a mejorar la seguridad del paciente y los procesos de comunicación.

Palabras clave: ISBAR, traspaso de enfermería, transferencia de información clínica, aprendizaje simulado, basado en escenarios.

1. Introduction

Clinical handover is defined as “the exchange of information between health professionals about a patient, accompanying either a transfer of control over or responsibility for the patient” (Burgess et al., 2020). A precise and thorough handover, when done correctly, improves stability; helps avoid mistakes and gaps in patient care; aids in the adequate comprehension of patients’ demands; and boosts nurses’ job satisfaction and expertise (Lee & Lim, 2021). Clinical handovers take place in various healthcare environments, ranging from ward handovers to high-risk emergency interfaces. The environments differ in complexity because of variations in pace, acuity, and team membership. Handovers in nursing take the form of bedside communication with patient engagement, whereas physician handovers are multidisciplinary and concerned with extensive clinical detail (Fealy et al., 2018). Outside of hospital settings, handovers from prehospital emergency staff to hospital teams are essential for the transfer of time-critical information. These tend to take place in dynamic, noisy conditions such as ambulances or emergency departments, where time constraints, distractions, and diverse professional relationships can impede good communication and information transfer (Wood et al., 2014). Inaccurate communication between healthcare personnel and inaccurate information exchange during handover are important causes of medical errors and unfavorable outcomes in health care settings across the world (Toumi et al., 2024). Numerous studies support that during

handovers between health care professionals, the information shared was inadequate, which affected patient care (Pilcher et al., 2022).

Over the years, several structured formats have been developed to improve the handover process. I-PASS is a system format created for pediatrics, which consists of “illness severity, patient summary, action list, situation awareness, contingency planning, and synthesis by receiver.” Other commonly used and studied formats include ISBAR, expanded as “Introduction, Situation, Background, Assessment, Recommendation.” ISBAR was built on SBAR, a communication system for nuclear submarines developed by the US Navy. The ISBAR framework, which has been promoted by WHO, is an established standard communication tool that can be easily used across various clinical situations, such as shift changeovers, patient transfers for diagnostics, inter-hospital transfers, and escalation for patients in need (Burgess et al., 2020). The ISBAR framework comprises five elements that focus on communication. “I” denotes introduction, which includes introducing oneself with designation, area of work, identifying the patient, person on call, and communicating the reason for the call. “S” stands for situation, which focuses on the current clinical condition of the patient. “B” refers to background, which states the issues that led up to the situation. “A” denotes an assessment that suggests what the nurse thinks is the issue. ‘R’ refers to recommendations that indicate the

essential steps that need to be taken to address the problem, including examining the patient's clinical condition for an accurate understanding of the scenario (Burgess et al., 2020).

Participating in clinical handovers prior to taking on patient care responsibilities prepares students for the profession (Malone et al., 2016). The Quality and Safety Education for Nurses Institute (2020) support the need for effective handoff communication skills as a necessary competency for undergraduate nurses to preserve patient safety and avoid unforeseen events (Le et al., 2023). Research examining the experiences of novice nurses in near-miss and adverse event scenarios revealed that communication breakdowns during handoffs were linked to seven out of eight cases. This finding highlights the necessity of incorporating handoff training into nursing education programs before licensure (Ebright et al., 2004). Despite its significance, little emphasis has been placed on teaching handoff communication skills through classroom instruction in varied nursing programs. Consequently, nursing students often rely on their clinical site experiences for handoff practice. This method presents challenges due to the varying handoff procedures across different clinical environments, ultimately leaving new graduates inadequately prepared for this essential aspect of nursing practice (Le et al., 2023). Often a successful clinical handover not only involves knowledge of procedure but also self-efficacy, the assumption that one has the ability to make the required communications in a stressful environment. Students with low self-efficacy have been associated with increased anxiety, communication failure, and reduced competence in the clinical environment. These findings underscore the potential of targeted, interactive education interventions in closing theory-practice divides and preparing the next generation of nursing professionals with the key competencies necessary to conduct safe, effective, and competent patient handovers.

Given the critical role of effective handoff communication in patient safety and the limited structured training provided in many nursing programs, there is a growing need for educational strategies that actively develop students'

communication competence and self-efficacy. Experiential and interactive teaching approaches have been increasingly recommended to bridge the gap between theoretical knowledge and clinical practice by providing opportunities for rehearsal, feedback, and reflection (Le et al., 2023). Among these approaches, scenario-based and simulation-based learning have gained prominence as pedagogical methods. Both Scenario-Based Learning (SBL) and Simulation-Based Learning are grounded in experiential learning theory, but they differ in their pedagogical focus for structured communication training. High-fidelity simulation is effective in improving psychomotor performance and short-term self-efficacy in clinical tasks (Cant & Cooper, 2017), yet it often emphasizes acute clinical management and technical skills, which may limit focused practice of standardized communication frameworks. In contrast, SBL emphasizes cognitive sequencing, contextual reasoning, and structured dialogue within realistic narratives, facilitating deeper understanding of communication protocols such as ISBAR (Yilmaz et al., 2020; Lavanya et al., 2024).

Scenario-based interactive learning, also termed scenario-based learning is a pedagogical approach that enables nursing students to engage in focused discussions. SBL is classified into four types of scenarios: professional argumentative scenarios, professionally hypothetical scenarios, scenarios for teaching skills and information, and scenarios for investigating problems. Well-crafted scenarios provide a foundation for educators to address the learning objectives and provide a meaningful learning experience for nursing students in delivering safer patient care in hospital settings (Ahmed, 2019). Previous literature states that simulation scenarios helped nursing students improve their communication abilities in areas such as reporting, documenting, patient instruction, and teamwork (Wang et al., 2015). Additionally, SBL promotes reflective debriefing and repeated verbal practice, which support self-efficacy development and knowledge integration (Ahmed, 2019; Safdar et al., 2020). Importantly, SBL is also more scalable and feasible in resource-limited settings, as it requires fewer simulation resources while still providing meaningful experiential learning.

The results of the study could add to the already established body of knowledge and could be used as part of the teaching strategy in the simulation or lab environment for effective clinical handover.

The researcher, therefore, aims at examining the effectiveness of using the scenario-based learning approach for the development of knowledge, self-efficacy, and competency for clinical handover.

2. Materials and methods

Design: The present study adopted a quantitative approach and true experimental design.

Ethical considerations: The institution's ethical committee provided ethical clearance prior to the proceedings and a formal permission from the institution was obtained. Informed consent was taken after explaining the study objectives and procedure. The participants were informed that they could dropout out at any time during study period voluntarily.

Sample and setting: To determine the exact sample size, it was calculated using G*Power version 3.1, which revealed that a sample of 35 participants in each group was needed to detect an effect size of 0.80 with 95% power ($1 - \beta = 0.95$) at a significance level of 0.05. However, to be on the safe side, a total of 40 participants were recruited in each group. The study participants were recruited from a total of 120 students of the 4th year Bachelor of Nursing and 3rd year Diploma Nursing course. Of these, a total of 80 participants who met all the eligibility criteria, were interested in participating in the study, and could attend the entire intervention process were randomly assigned into either the experimental or control group using a lottery method. Each group had a total of 20 Bachelor's degree and 20 Diploma nursing course students.

Instruments: Demographic data from research participants were obtained by using a Performa. The researcher developed a structured multiple-choice questionnaire on clinical handover and the ISBAR approach to evaluate the knowledge of students, consisting of ten items with "0" scored for wrong answer and "1" scored against correct answer. The validation of questionnaire was done by the nurse educators and practitioner

experts in the field and modifications were made as recommended. A self-efficacy scale to assess the individual's belief in performing clinical handover was adopted from a study by Lee & Lim (2021). The tool consisted of 17 items graded on a 5-point Likert scale. The scale ranged from "Strongly agree" to "Strongly disagree." The score ranges from 17 to 85 points. Higher scores indicate greater self-efficacy. The reliability of the tool was verified using Cronbach's α in the Lee & Lim study, which was 0.958 (Lee & Lim, 2021). The researcher developed a standardized checklist to measure the students' ability to perform ISBAR during clinical handover. It consisted of total 12 items: 3 items on introduction, 2 items on situation, 3 on background, 1 on assessment and 3 on readback/recommendations. Score "0" indicated not performed and "1" indicated performed. Experts in nursing practice and education validated the checklist and necessary corrections were incorporated. Prior to the main study, a pilot study was undertaken to evaluate the reliability of the research instruments. The questionnaire yielded a reliability coefficient of 0.71. The internal consistency of the self-efficacy scale was established using Cronbach's α ($\alpha = 0.85$), and the checklist demonstrated a Cronbach's α value of 0.75, indicating acceptable reliability.

Scenarios: Three scenarios based on various clinical handover situations were developed. The scenarios encompassed shift handover, transfer out to a ward, and referral to another hospital, and were developed with reference to actual clinical cases. Handover guidelines based on ISBAR and a debriefing plan were also developed. The scenarios were reviewed by a panel of experts, including nursing educators and clinicians with expertise in simulation-based education and

patient safety communication. They reviewed the scenarios for relevance, clarity, realism, and appropriateness based on the ISBAR framework. Minor modifications were made to the scenarios based on the experts' feedback to enhance clarity. Content validity was determined based on the Content Validity Index (CVI) method. Content validity for the scenarios was satisfactory with CVI of 0.75, indicating the scenarios' appropriateness for training participants on the use of the ISBAR framework for effective clinical handovers.

2.1 Data collection procedure

The study was done from the 4th of September 2023 to the 30th of September 2023. On the first day, the participants were made aware of the study objectives and the procedures. The baseline measurements for the study consisted of administering the knowledge questionnaire and the self-efficacy scale (Likert scale) for the participants in both the experimental and control groups. The competency assessment tool for the study was the Objective Structured Clinical Examination (OSCE), based on scenarios and using a structured checklist, conducted by the assessor who was blind to the groupings.

Intervention:

The control group was provided with the standard lecture on clinical handover and the components of the ISBAR system. The experimental group was provided with the interactive teaching in the skill laboratory for 3 hours using the pre-developed scenarios. The intervention consisted of the lecture and the scenarios using role play.

Phase 1: Lecture Session

The session began with a 1-hour interactive lecture delivered by the research team. The lecture covered the importance of effective clinical handover in patient safety, common communication errors during handover, and the principles and components of the ISBAR communication tool. Examples of structured handover using ISBAR were demonstrated to familiarize participants with the framework.

Phase 2: Scenario Demonstration (20 mins)

Following the lecture, the research team conducted scenario-based role play using pre-developed clinical scenarios related to patient care situations requiring handover communication.

Example of Case scenario 1:

Component	Description
Scenario Title	Use of ISBAR Structured Communication for Referral of a Child with Acute Diarrhoea
Learning Objectives	1. Identify the components of the ISBAR communication tool. 2. Apply ISBAR for structured patient handover. 3. Communicate patient information clearly and concisely during referral.
Target Participants	Nursing students
Scenario Setting	Remote community health clinic
Clinical Context	A 15-year-old child presenting with persistent diarrhoea and worsening dehydration requiring referral to a higher center
Scenario Duration	Pre-briefing (5 min), Simulation scenario (15min), Debriefing (20 min)
Patient Condition	Acute diarrhoea with signs of moderate dehydration and hemodynamic instability
Key Clinical Information	Initial vitals: BP 90/60 mmHg, Pulse 118 bpm, RR 26 bpm, Temp 98.6°F, SpO ₂ 98%. After 3 hours: BP 88/58 mmHg, Pulse 124 bpm, RR 28 bpm.
Interventions Initiated	IV Normal Saline 500 mL over 90 minutes, Oral Rehydration Therapy (ORS), Zinc supplementation, Ecobion sachet
Simulation Activity	Participants perform a telephonic referral to a higher center using the ISBAR communication framework
Expected Learner Actions	Assess patient condition, recognize worsening dehydration, prepare referral, and communicate patient information using ISBAR format
Evaluation Method	Performance checklist assessing ISBAR components, clarity of communication, and accuracy of patient information
Debriefing Focus	Reflection on communication clarity, accuracy of information transfer, and clinical decision-making during referral

These demonstrations illustrated the practical application of the ISBAR structure in clinical communication.

Phase 3: Small Group Practice (20 mins)

Participants were organized into small groups of four, forming a total of ten groups, to engage in scenario-based handover practice. Each group received clinical scenarios and was instructed to perform handovers using the ISBAR framework. Within each scenario, participants were assigned specific roles: one as the nurse, one as a healthcare team member at the referral unit, and two as observers, to facilitate structured role-based practice.

Phase 4: Debriefing (1 hr 20 mins)

After the small group practice, a structured debriefing session was conducted for all participants. At this time, participants were able to review the scenarios, reflect on their communication practices, and examine the application of each component of the ISBAR framework. This ensured that participants were reinforced in the proper handover techniques. To minimize contamination, data collection for the control group was completed before the experimental group, and participants were instructed not to discuss the intervention with peers in the control group.

Posttest measurement: Post-test measurement was conducted for both the experimental and control groups consequently after intervention in the same manner with the tools.

Statistical analysis: The data were compiled, coded in Excel, and analyzed using SPSS version 26.0. Descriptive statistics like percentage and mean was used to describe the demographic data. The baseline characteristics of experimental and control groups were compared using person chi square and independent test. The distribution of outcome variables was assessed using the Shapiro–Wilk test. Knowledge scores were normally distributed in both the control and experimental groups ($p > 0.05$). Self-efficacy scores were normally distributed in the control group but not in the experimental group, whereas competency scores were not normally distributed in either group ($p < 0.05$). Despite these deviations from normality, ANCOVA and t-tests are generally robust to moderate violations, particularly with sample sizes ≥ 30 ; thus, the use of ANCOVA was deemed appropriate. Paired t-tests were employed to examine within-group differences between pretest and posttest scores, while Analysis of Covariance (ANCOVA) was used to compare posttest scores between the experimental and control groups. Pearson's correlation coefficient was applied to assess the relationships among the study variables.

3. Results

Table 1: Analysis of socio-demographic data of experimental and control group.
Source: Own elaboration, 2025.

Variables	Category	Control (n=40) n (%)	Experimental (n=40) n (%)	χ^2 value	p value
Gender*	Male	7 (17.5%)	12 (30.0%)	1.10	0.29
	Female	33 (82.5%)	28 (70.0%)		
Witnessed clinical handover during practicum*	Yes	13 (32.5%)	11 (27.5%)	0.06	0.80
	No	27 (67.5%)	29 (72.5%)		
Variable		Control (n=40) M(SD)	Experimental (n=40) M(SD)	t value	p value
Age (years)+		20.55 (1.43)	20.93 (2.29)	-0.88	0.38

Note:

*. Pearson Chi square

+-. Independent t test

The table 1 shows the demographic characteristics of experimental and control group. Among the participants of the experimental group, 70% (n = 28) were females, and 30% (n = 12) were males, whereas among the participants of the control group, 82.5% (n = 33) were females, and 17.5% (n = 7) were males. None of the participants from either group reported having undergone any specific training program on clinical handover. Most of the participants in the experimental group (75%, n = 30) and the control group (70%, n = 28) reported having not witnessed the handover during clinical practice.

For assessing the homogeneity of demographic variables in the experimental and control groups, a Chi-square test was applied. It was revealed that there were no statistically significant differences in gender composition ($\chi^2 = 1.10$, $p = 0.29$) and witnessing a shift handover ($\chi^2 = 0.06$, $p = 0.80$) between the two groups. As all participants in both groups declared a lack of any prior training in clinical handover, it is not possible to apply a Chi-square test in this case because of a lack of variability in the data. In general, it could be concluded that the experimental and control groups were homogeneous in their composition. The mean age of participants in the control group was 20.55 ± 1.43 years, whereas in the experimental group it was 20.93 ± 2.29 years. The homogeneity of age between the control and experimental groups was assessed using an independent t-test. The calculated t value was -0.88 with a p value of 0.38, which is greater than 0.05, which indicates that there is no statistically significant difference in age between the two

groups. Therefore, the control and experimental groups were homogeneous with respect to age.

3.1 Within subject effects

Table 2 presents the Within-group analysis using paired t-tests revealed significant improvements in the experimental group across all outcome variables. Knowledge scores increased significantly from 4.05 ± 1.82 to 5.55 ± 2.79 ($t(39) = -2.89$, $p = 0.006$), demonstrating a moderate effect size ($d = 0.46$). Self-efficacy showed a substantial increase from 55.00 ± 8.32 to 66.10 ± 5.73 ($t(39) = -9.60$, $p < 0.001$), with a large effect size ($d = 1.52$). Similarly, competency scores improved markedly from 4.85 ± 1.16 to 10.27 ± 2.28 ($t(39) = -13.50$, $p < 0.001$), indicating a very large effect ($d = 2.13$).

In the control group, self-efficacy and competency scores showed statistically significant improvements, though the effect sizes were smaller. Knowledge scores did not demonstrate a statistically significant change ($p = 0.47$). Overall, the intervention produced moderate to very large improvements in the experimental group, particularly for competency and self-efficacy outcomes.

3.2 Between-Subject Effects

Table 3 depicts the ANCOVA analysis revealed a comparison of post-test knowledge, self-efficacy, and competency scores of both groups while controlling pre-test values. After adjusting pre-test values, a significant effect of group

Table 2. Within-Group Comparison of Pre-test and Post-test Scores of Knowledge, Self-Efficacy, and Competency Using Paired t-test, n1=40, n2=40.
Source: Own elaboration, 2025.

Variable	Group	Pre-test Mean ± SD	Post-test Mean ± SD	t (df)	p value	Effect Size (Cohen's d)
Knowledge	Experimental (n = 40)	4.05 ± 1.82	5.55 ± 2.79	-2.89 (39)	0.006*	0.46
	Control (n = 40)	3.25 ± 1.12	3.45 ± 1.70	-0.72 (39)	0.470	0.11
Self-Efficacy	Experimental (n = 40)	55.00 ± 8.32	66.10 ± 5.73	-9.60 (39)	<0.001**	1.52
	Control (n = 40)	54.80 ± 7.35	58.25 ± 7.59	-3.01 (39)	0.004*	0.48
Competency	Experimental (n = 40)	4.85 ± 1.16	10.27 ± 2.28	-13.50 (39)	<0.001**	2.13
	Control (n = 40)	5.92 ± 1.67	7.37 ± 1.14	-4.80 (39)	<0.001**	0.76

Note: * $p < 0.05$ significance level; ** $p < 0.001$ level of significance
df = degrees of freedom.

Table 3. Between-Subjects Effects of the Intervention on Knowledge, Self-Efficacy, and Competency at Post-test Using ANCOVA, (N = 80)
Source: Own elaboration, 2025.

DV	IV and COV	Control (n = 40) M (SD)	Experimental (n = 40) M (SD)	ANCOVA F	p	Partial η^2	R ² (adjusted R ²)	Power
Knowledge	Group	3.45 (1.70)	5.55 (2.79)	F(1,77) = 13.49	<.001	0.149	0.182 (0.162)	0.95
	T ₁ (Pre-test)	3.25 (1.12)	4.05 (1.82)	F(1,77) = 0.90	.346	—	—	0.16
Self-Efficacy	Group	58.25 (7.59)	66.10 (5.73)	F(1,77) = 0.17	.681	0.002	0.075 (0.051)	0.07
	T ₁ (Pre-test)	54.80 (7.35)	55.00 (8.32)	F(1,77) = 6.45	.013	—	—	0.71
Competency	Group	7.37 (1.14)	10.27 (2.28)	F(1,77) = 46.97	<.001	0.379	0.402 (0.387)	1.00
	T ₁ (Pre-test)	5.92 (1.67)	4.85 (1.16)	F(1,77) = 0.26	.612	—	—	0.08

Note:

DV = dependent variable; IV = independent variable; COV = covariate; T₁ = pre-test score.

ANCOVA = analysis of covariance.

η^2 = partial eta squared (effect size).

Power represents the observed statistical power of the test.

difference on knowledge ($F(1,77) = 13.49$, $p < .001$, $\eta^2 = 0.149$) and competency ($F(1,77) = 46.97$, $p < .001$, $\eta^2 = 0.379$) were found. The observed power of these analyses was high (0.95 and 1.00 respectively), indicating a high power of this study to detect differences. In contrast, no statistically significant difference in self-efficacy scores between both groups after adjusting pre-test values ($F(1,77) = 0.17$, $p = .681$, $\eta^2 = 0.002$) was found; moreover, the observed power of this analysis was found to be low (0.07). Pre-test self-efficacy significantly contributed to post-test self-efficacy ($F(1,77) = 6.45$, $p = 0.013$).

A high effect size of this intervention on knowledge (0.149) and a very high effect size (0.379) was found, while a negligible effect size (0.002) on self-efficacy was found.

Table 4 shows the adjusted post-test means calculated using ANCOVA revealed that the experimental group showed higher scores than the control group with respect to knowledge and competency after controlling the baseline data. With respect to knowledge, the adjusted mean score for the experimental group was 5.48 (95% CI: 4.74-6.23), whereas the adjusted mean score for the control group was 3.52 (95% CI: 2.77-4.26).

Similarly, the scores for competency were higher for the experimental group than the control group. Here, the adjusted mean score for the experimental group was 10.31 (95% CI: 9.72-10.91), whereas the adjusted mean score for the control group was 7.34 (95% CI: 6.74-7.93). This showed a high intervention effect.

However, the scores for self-efficacy were not significantly different for the two groups. Here, the adjusted mean score for the experimental group was 57.39 (95% CI: 54.08-60.70), whereas the adjusted mean score for the control group was 56.41 (95% CI: 53.10-59.72).

3.3 Correlation of Knowledge, Self-Efficacy and Competency Scores

Table 5 displays the correlation analysis was carried out to investigate the relationship between knowledge, self-efficacy, and competency.

Table 4. Adjusted Post-Test Means and 95% Confidence Intervals After ANCOVA.
Source: Own elaboration, 2025.

Outcome Variable	Group	Adjusted Mean	95% Confidence Interval
Knowledge	Control	3.52	2.77 – 4.26
	Experimental	5.48	4.74 – 6.23
Self-Efficacy	Control	56.41	53.10 – 59.72
	Experimental	57.39	54.08 – 60.70
Competency	Control	7.34	6.74 – 7.93
	Experimental	10.31	9.72 – 10.91

Table 5: The relationship between scores of knowledges, self-efficacy and competency, n=80
Source: Own elaboration, 2025.

Karl Pearson correlation	1	2	3
Knowledge	-		
Self-Efficacy	0.362* (0.022)	-	
Competency	0.476** (0.0002)	0.053 (0.745)	-

Note:

*p<0.05 significance level

**p<0.001 significance level.

Pearson's correlation analysis showed a moderate positive correlation between knowledge and self-efficacy ($r = 0.362$, $p = 0.022$). This implies that an increase in knowledge level corresponds to an increase in self-efficacy level. Moreover, a positive correlation between knowledge and competency ($r = 0.476$, $p = 0.0002$) suggests that an increase in knowledge level corresponds to an increase in competency level. However, no statistically significant relationship was found between self-efficacy and competency ($r = 0.053$, $p = 0.745$), indicating that perceived confidence may not necessarily translate into measurable competency outcomes.

4. Discussion

The present study examined the effectiveness of the scenario based interactive learning approach on the development of knowledge, self-efficacy, and competency. The results showed that the participants who underwent the scenario based interactive learning approach showed a significant improvement in their knowledge and competency compared to the participants of the control group. However, the results showed that there was no significant impact of the scenario based interactive learning approach on the self-efficacy of the participants after adjusting the results. These findings highlight the potential of scenario-based learning strategies in enhancing cognitive and practical competencies among learners.

The improvement in knowledge acquisition in the experimental group could be attributed to the active learning environment provided through scenario-based learning strategies. Scenario-based learning strategies and simulation-based learning strategies provide learners with opportunities to apply theoretical knowledge in real-life situations, thereby promoting better understanding and retention of knowledge. Recent studies have shown that simulation-based learning strategies are a viable approach in nursing education to improve knowledge acquisition and skill development in nursing

students (Alharbi et al., 2024). Scenario-based learning strategies also provide opportunities for experiential learning through problem-solving strategies in real-life situations, thereby promoting cognitive understanding of complex clinical situations (Baek et al., 2022). Scenario-based learning strategies also provide opportunities to promote experiential learning through problem-solving strategies in real-life situations, thereby promoting cognitive understanding of complex clinical situations (Baek et al., 2022).

Moreover, the findings of the present study revealed a significant development in the competency of the participants of the experimental group. The development of competency is an essential part of the education of nurses since it is the integration of knowledge, psychomotor skills, and decision-making. Scenario-based learning is an approach to education that allows learners to exercise their clinical decision-making skills in a controlled environment of learning. Scenario-based learning bridges the gap between the classroom and the clinical environment. Previous studies have shown that scenario-based training is effective in improving the clinical competencies of nursing students. Scenario-based training is effective in improving the clinical competencies of nursing students in the following areas: communication skills, teamwork skills, and practical skills for

the safe care of patients (Sadeghi et al., 2023). Moreover, studies have shown that simulation-based education is effective in improving the clinical skills, decision-making ability, and professional competence of nursing students (Görücü et al., 2024).

Despite the progress in knowledge and competency, the results did not demonstrate a statistically significant impact on self-efficacy after adjusting the scores. One possible explanation for this could be that self-efficacy can be influenced by a variety of psychological factors. For example, self-efficacy can be shaped by previous experiences, levels of confidence, and mastery experiences. While educational interventions can be effective in improving knowledge and skill levels in the short term, the development of self-efficacy can be a long-term process that involves repeated exposure to the learning content. Past studies have also indicated

that simulation-based learning can be effective in improving learners' confidence and competence. However, the level of improvement in self-efficacy can vary depending on the length of the educational intervention. For example, Saragih et al. (2024) indicated that the improvement in self-efficacy can vary depending on the length of the educational intervention.

Overall, the findings of the current study lend support to the emerging body of evidence that scenario-based interactive learning is an effective approach to improving the knowledge and competency of learners. This is because scenario-based learning provides learners with real-life situations that allow them to learn by experience, which can improve their understanding and skills as future healthcare practitioners. Scenario-based learning can improve the curriculum used to train healthcare professionals to become more effective and competent.

5. Strengths and Limitations

There are several strengths to the present study. First and foremost, the study had a controlled design that enabled the comparison between the experimental and control groups. This helped to increase the internal validity of the study. Secondly, the study had more than one outcome variable, including knowledge, self-efficacy, and competency. This helped to provide a more complete evaluation of the effectiveness of the scenario-based interactive learning intervention. Thirdly, the study had a more robust statistical analysis with the inclusion of both within-group analysis using the paired t-test and between-group analysis using ANCOVA to control for baseline differences in the pre-test scores between the groups. In addition, the inclusion of effect size measures helped to provide more insight into the study's results.

Despite the above-mentioned strengths of the study, a few limitations need to be mentioned. Firstly, the sample size of the participants was relatively small, and the study setting was a single location. Secondly, the duration of the intervention period was relatively short. This could be the reason for the lack of improvement in the self-efficacy scores of the participants. Generally, changes in psychological constructs take a longer period to occur. Thirdly, the study used self-reported methods to collect data for a self-efficacy outcome which may have subjected to response bias. Future studies need to be carried out with a large sample size, a longer duration of the intervention period, and a multicenter setting to confirm the findings of the present study.

6. Conclusions

Scenario-based interactive learning has been observed to be effective in the improvement of the level of knowledge and competence of nursing students. It has been noted that the intervention has a positive effect on the critical thinking, reflective learning, and problem-solving skills of the students. Although the intervention has a positive effect on the level of

self-efficacy of the students, the results are not significant, psychological states need a long-term intervention. It has been observed that the application of scenario-based interactive learning provides a viable and creative way of addressing the gap between theory and practice in the improvement of the level of educational outcome in nursing education.

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