KIU Journal of Education (KJED)

Volume 5 Issue 1
Page 317 – 325

April – May 2025
https://kjed.kiu.ac.ug/

A comparative study of critical thinking levels in clinical decision-making of student nurses at Kampala International University, Uganda

Obeagu Getrude Uzoma [1], Marudhar[2] & Mohammad Turkur [3]
[1,2] Department of Nursing Science, Kampala International University, Uganda
[3] Department of Science Education, Kampala International University, Uganda
Corresponding Author: uzomagertrude@gmail.com

Abstract

Background: Critical thinking is the capability to adequately analyze information to make decision. Critical thinking development is an essential skill in nursing and medical profession. Goal of nursing education is to produce critical thinkers capable of making clinical judgments as well as clinical decision. Critical thinking is a form of reflective thinking or cognitive reasoning consisting of analysis and evaluation of existing communication, information and arguments using logic and reason. The study aimed to compare the critical thinking levels in clinical decision making among different groups within the student nurses at KIU using lecturing and CBL pedagogy. Research Design: Cross-sectional comparative design. Purposive sampling technique was adopted with total sample of 43 student nurses. The instrument for data collection was a structured test questionnaire. PBDSM Numerical Scoring Framework using a 4-point type scale was used to measure the level of critical thinking levels in clinical decision making. Data analysis methods were percentages and t-test. RESULT: CBL group showed participant's level of critical thinking in clinical decision making was levels 1 to 3 in pretest and levels 2 to 4 in post-test while lecture method group was levels 2 to 3 in pretest and levels 2 to 4 in post-test using PBDSM. The mean CBL group pretest scores were 11.75 ± 2.53 and post-test scores mean value of 16.10 ± 72.08. Lecture method group pretest score mean was 12.27 ± 1.44 while their mean post-test was 14.00 ± 2.75. Both groups have a statistically significant level of 0.000. Conclusion: This study showed CBL has positive impact on critical thinking in clinical decision making of student nurses contributing to growing body of knowledge on nursing education, offer insights for improving preparation of nursing students for real-world clinical challenges as well as understanding how nursing education can better prepare students for the dynamic demands of healthcare practice in Uganda and beyond. Key recommendations include adopting evidence-based teaching strategies, such as simulation-based learning and case-based learning/discussion, to foster critical thinking development at all levels.

Keywords: Critical thinking, clinical decision-making, nursing education, student nurses, Kampala International University, Uganda.

Introduction

Critical thinking is essential for effective clinical decision-making in nursing, directly impacting patient care results (Van Nguyen and Liu, 2021). Critical thinking is fundamental to nursing practice, allowing professionals to assess intricate situations, appraise evidence, and make informed clinical choices that enhance optimal patient outcomes (Anna et al., 2016). In the ever-changing and frequently uncertain clinical setting, nursing students need to cultivate these skills early in their education to guarantee safe and efficient patient care. Clinical decision-making, a process inherently tied to critical thinking, encompasses evaluating patient conditions, prioritizing interventions, and assessing outcomes, establishing it as an essential skill in nursing education (Connor et al., 2023). Critical thinking is an essential cognitive ability for healthcare workers, especially nurses, whose choices directly influence patient results. In healthcare environments, efficient decision-making requires assessing intricate situations, considering evidence, and forming judgments in high-pressure situations (Zavala et al., 2018). For nursing students, this ability grows through learning and hands-on experience, creating a basis for professional proficiency. Nurses must swiftly and accurately decide in intricate and changing healthcare settings, frequently while under stress. Consequently, cultivating robust critical thinking abilities in nursing education is essential for equipping students for the challenges of professional practice.

In Uganda, nursing education has grown considerably to address the increasing demand for qualified healthcare workers. Kampala International University (KIU), a premier institution in the area, provides nursing programs aimed at providing students with practical skills and theoretical understanding. Nonetheless, the degree to which these initiatives promote critical thinking and its use in clinical decision-making has not been thoroughly examined. Even

with attempts in nursing education to incorporate critical thinking, deficiencies remain in its use during clinical decision-making (Hafiz et al., 2023). This shortcoming may result in mistakes, jeopardizing patient safety. At KIU, it is still ambiguous how much critical thinking student nurses exhibit during clinical practice. Research worldwide indicates that levels of critical thinking in student nurses differ by academic year, typically enhancing with greater exposure to clinical environments and problem-solving activities (Mclean, 2016). Nevertheless, these advancements are not always reliable or adequate, emphasizing the necessity for focused educational approaches. In Uganda, there is insufficient research evaluating critical thinking growth among nursing students, leading to a knowledge gap that this study aims to fill. This study intends to evaluate the critical thinking abilities of nursing students at KIU throughout various academic years and to examine the application of these skills in clinical decision-making. The study aims to uncover patterns, strengths, and weaknesses in students' critical thinking skills to offer insights on improving nursing education for better preparation of graduates for clinical practice. The results will not only guide curriculum development at KIU but may also add to wider conversations about enhancing nursing education in Uganda and comparable settings.

Literature Review

Critical Thinking in Clinical Decision Making

Nursing education in Uganda is transforming to align with the requirements of an evolving healthcare environment, striving to create proficient and flexible nurses who can provide excellent care and meet the healthcare needs of the community (Al-Harahsheh et al., 2020; Telfer et al., 2021). Nurses applied specialized abilities such as assessment, teamwork, evaluation, critical thinking, and clinical decision-making in their everyday clinical work. Critical thinking developed during nursing education is essential to the nursing process. Nurses need to evaluate situations, collect pertinent information, interpret data, and make informed decisions regarding patient care. This method includes combining information from multiple sources to create suitable interventions. Nurses face intricate and varied healthcare issues every day (Hundial, 2020). Critical thinking provides them with the ability to solve problems by recognizing issues, assessing options, and applying solutions promptly and effectively. Nurses who possess strong critical thinking abilities are more capable of detecting slight variations in a patient's status, predicting possible complications, and implementing proactive strategies to guarantee patient safety, which is vital for avoiding medical mistakes and delivering high-quality care (Sole et al., 2020).

Nurses employ critical thinking to evaluate research results, scientific data, and optimal practices to incorporate this information into their clinical decision-making process, guaranteeing that patient care relies on the latest and most trustworthy information accessible (Risling, 2017). Essentially, critical thinking in nursing extends beyond simple problem-solving; it involves a comprehensive approach to patient care. Nurses with strong critical thinking skills in clinical decision-making greatly enhance patient outcomes, improve care quality, and further the nursing profession. Therefore, cultivating and developing critical thinking abilities is crucial in nursing education and career advancement. In the evolving realm of healthcare, nursing education is crucial in developing skilled and proficient professionals. Among the essential skills required for nursing students to excel in clinical practice, critical thinking and effective clinical decision-making stand as cornerstones. Kampala International University (KIU) in Uganda, recognizing the significance ofthese skills, has been actively exploring educational methodologies to enhance their students' capabilities. This study aims to investigate the profound influence of utilizing case-based learning as an educational tool on the development and refinement of critical thinking skills in clinical decision-making among nursing students at KIU

Case-based Learning

Case-based learning acts as a link between theoretical understanding and practical use, providing students the chance to participate in real-world situations within a structured educational setting. Uganda's healthcare system, similar to numerous others around the world, requires nurses capable of quickly assessing intricate situations, making knowledgeable choices, and delivering efficient patient care (Albutt et. al., 2018). Incorporating case-based learning into the nursing curriculum at KIU aims to foster these skills in students, empowering them to tackle the complex obstacles of clinical practice with assurance and skill.

Moreover, case-based learning is essential in education across multiple fields, including nursing, owing to its diverse contributions to skill enhancement and knowledge acquisition. Case-based learning connects the theoretical ideas presented in classrooms with their real-world applications in practical situations (O'Donovan and McAuliffe, 2020). They allow student nurses to utilize their theoretical knowledge in simulated or real patient scenarios, improving their grasp of intricate concepts. Case-based learning fosters critical thinking by offering real-world, complex scenarios that necessitate analysis, evaluation, and resolution. Student nurses are encouraged to evaluate data, recognize trends, explore different viewpoints, and make well-informed choices, thus enhancing their critical thinking skills in clinical decision-making.

Lecture Method

The lecture approach is a conventional educational strategy frequently employed in nursing education, particularly for nursing students. Although it is frequently used because it can transmit substantial information effectively to an audience, it demands meticulous planning and implementation to achieve success (Liu et al., 2023). The lecture method is defined by organized presentation, the ability to accommodate a large audience, efficiency in time usage, and an emphasis on fundamental ideas (Lowe and Borkan, 2021). Structured instruction; the teacher delivers well-organized material on a particular subject, frequently utilizing aids such as PowerPoint, whiteboards, or handouts. It adheres to a distinct structure, including an introduction, body, and conclusion. Spacious audience capacity; Perfect for delivering theoretical material to extensive groups at once. Time efficiency; a large amount of information can be conveyed in a brief timeframe (Lowe and Borkan, 2021).

Concentrate on Fundamental Ideas; Valuable for presenting basic principles that learners will subsequently use in practical environments (Makhene, 2022). Its challenges, however, involve passive learning, requiring instructors to integrate active learning components such as questions or problem-solving activities. Retention is limited; instructors must support lectures with handouts, summaries, and subsequent activities. Combine lectures with various educational techniques such as group discussions, simulations, or practice of skills (Henk et al., 2015). To sum up, by integrating the lecture approach with interactive and hands-on teaching techniques, instructors can successfully involve nursing students, improve comprehension, and equip them for clinical practice.

Critical Thinking in Clinical Decision-Making of Student Nurses

Critical thinking is the ability to effectively assess information to form judgments (Ryan, 2023). Developing critical thinking is a vital ability in the nursing and medical fields. The aim of nursing education is to develop critical thinkers who are skilled in making clinical judgments and decisions. Critical thinking represents a type of reflective thinking or cognitive reasoning that involves analyzing and assessing current communication, information, and arguments through the application of logic and reasoning (Heard et al., 2020). David Hitchcock in 2017 states that critical thinking involves evaluating current intellectual outputs. The term critical thinking was coined by John Dewey in 1910, an American philosopher and educator, in his book How We Think. The progressive education movement embraced it as the primary educational goal that provided a vibrant contemporary alternative to conventional teaching methods known for memorization (Gosner, 2024). Rote learning is a technique for memorizing information through repeated exposure, which helps solidify the information in memory (Ahmed, 2017). Critical thinking in education involves a cognitive approach that employs intentional reasoning and unbiased analysis of data to reach a discernible solution to an issue. It requires a collection of logical abilities acquired through educational experiences and a framework oriented towards reflective open inquiry that can be developed (Gosner, 2024).

Critical thinking consists of six fundamental skills: interpretation, analysis, inference, evaluation, explanation, and self-regulation (Facione, 2023). The skill encompasses the capacity to deconstruct information or issues into their constituent elements to uncover their foundational logic and assumptions, recognize personal biases in judgment and experience, assess evidence, and arrive at a decision to propose a solution to a problem (Heard et al., 2020; Almulla and Al-Rahmi, 2023). In health care delivery, nurses apply critical thinking in clinical decision-making utilizing the nursing process (Chacon and Janssen, 2021). Critical thinking is crucial in nursing education because of its vital role in developing skilled and capable nurses. Nurses require robust critical thinking abilities to recognize and resolve patient issues efficiently, enabling them to make informed clinical decisions (Hundial 2020). Nurses often face ethical challenges in healthcare; critical thinking enables them to address ethical concerns, honor patient autonomy, support patient rights, and make ethical choices. Analytical reasoning enhances cultural awareness and flexibility in nursing practices. Critical-thinking nurses can grasp various patient viewpoints, honor cultural distinctions, and offer culturally aware care (Turkson-Ocran et al., 2022). In conclusion, Sapeni and Said (2020) alongside Roshangar et al. (2020) indicate that case-based learning significantly enhances nursing students' critical thinking abilities, promoting proficiency in clinical decision making.

Clinical decision making is a balance of established best practices based on research and evidence, awareness of the current conditions and environment, along with understanding the patient (Nibbelink and Brewer, 2018). A skilled nurse is responsible for making clinical decisions involving patients and clients during the provision of their health care. Clinical decision making is where experience, awareness, knowledge, and data collected through appropriate assessment tools converge with evidence-based practice (Homberg et al., 2019). Clinical decision-making skills are essential for delivering safe, effective, and patient-focused nursing care (Asna et al., 2021). Critical thinking serves as the basis for clinical decision-making. It entails reasoning logically, analyzing data, assessing evidence, and the capacity to weigh various viewpoints in order to make informed choices (Obeagu et al., 2024). Nursing students need to learn how to integrate evidence-based guidelines and research results into their decision-making.

Clear interaction with patients, families, and healthcare teams is essential for informed decision-making. Nursing students need to communicate information effectively and work with others during the decision-making process (McCarthy Veach et al., 2018). Case-based learning effectively teaches clinical decision-making and critical thinking skills in the training of health care professionals. Case-based learning acts as an effective educational resource in nursing education, offering students an opportunity to actively participate in real-world situations, utilize critical thinking skills, and enhance their clinical decision-making capabilities to equip them for the diverse challenges they will face in their nursing professions (Roshangar et. al., 2020; Saab et al., 2021). Effective clinical decision-making results from an integration of experience and skills that promote safe care, developed primarily through a student-centered learning approach. The Fundamental Skills of Clinical Decision Making are recognition/ learningfrom experience, Critical thinking, Communication Skills, evidence-based approaches/available evidence plus best practice guidelines, team work and reflection (Lai *et al.*, 2022).

Moreover, critical reflection is an essential professional skill that nurses require. The capability of nurses to apply critical thinking involves reflection, induction, deduction, data analysis, and evaluation of information to inform clinical decision-making (Homberg et al., 2019). In an integrative review, Nibbelink and Brewer (2018) indicated that nursing experience, organizational factors, and ward dynamics affect decision-making, education, awareness of patient status and situations, and autonomy in nursing practice. Hamideh et al. (2021), in a quasi-experimental study assessing critical thinking in clinical decision-making among nurses in Iran using a pre-post-test two-group design with 74 cardiac care unit (CCU) nurses, found that the average score for the intervention group's clinical decision-making pretest was

141.59, while for the control group, it was 148.56. The posttest revealed an average total score for nurses' clinical decision-making in the intervention group (163.82), indicating a significant improvement compared to a score of 154.50 in the control group. The study finds that teaching critical thinking through the critical card tool improves clinical decision-making for CCU nurses. Additionally, Rezaee et al. (2022) conducted a pre- and post-test study involving 128 nursing students enrolled in nutrition courses, utilizing a problem-solving inventory; they found pretest scores of problem-solving confidence (39.64), approach-avoidance style (58.98), and personal control (18.57), with mean score reductions in the posttest (33.39, 47.47, 14.16) respectively. Furthermore, the scientific assessment of academic performance after training improved significantly, rising from 47.89 to 81.32 ($P < 0.001$). The study concludes that the case-based experimental learning (CBEL) methodology enhances nursing students' capabilities in solving educational challenges, improving academic performance, and addressing clinical issues in practice.

Rababa and Al-Rawashdeh (2021) carried out a descriptive correlational study in Jordan with 115 nurses focused on pain management utilizing the Critical Thinking Self-Assessment Scale (CTSAS) and Nursing Decision-Making Instrument (NDMI). The study revealed a mean score for the CTSAS of 307.3, which is lower than the average mean of 345 for the scale indicating a low level of critical thinking. The average NDMI score for nurses was 78.9, with a significant portion (66.9%) identified as knowledgeable decision-makers, while 33.1% were procedure decision-makers, highlighting deficiencies in critical thinking and decision-making abilities among critical care nurses. Ahmady and Shahbazi (2020) conducted a quasi-experimental study employing a pre-test/post-test design with two groups, involving 40 fourth-year nursing students in Iran who were randomly assigned to experimental and control groups for a CBL course on social problem-solving, which focused on critical thinking and decision-making, utilizing the California critical thinking skills test and a decision-making questionnaire. The study showed mean scores of the experimental group (9.98) and the control group (10.25) in the pretest, while the posttest scores were (14.36 and 10.72) respectively for critical thinking. Mean scores for decision-making were 13.72 for the experimental group and 13.63 for the control group in the pretest, while the posttest scores were 18.35 and 14.05 respectively, indicating improved critical thinking and decision-making abilities. In summary, educational strategies like problem-based learning, case-based learning, group discussions, role plays, the think-aloud method (Raymond et al., 2018), and utilizing a concept map (Meraji et al., 2016) from the literature review promote critical thinking and clinical decision-making. Abu et al. (2023) found that age, gender, and nursing education are factors influencing critical thinking in clinical decision-making.

Research Methodology

Research Design: This research adopted cross-sectional comparative design, a type of observational research design that collects data from different groups at a single point in time to examine and compare student nurses' critical thinking in clinical decision making. The study aims to compare **critical thinking levels** among different groups within the student nurse population at KIU using quantitative approach. Study Population was 55 Bachelors of nursing science students in third and fourth year at KIU. The researcher adopted purposive sampling technique and sampled the entire study population into two groups. However, 43 student nurses consented and participated in the study. Case-based learning group were 28 student nurses from third year second semester and fourth first semester year. Lecture method group were 15 in number consisting of student nurses from third year first semester.

Instrument for data collection: Instrument for data collection was structured test questionnaire on topic anaemia in pregnancy. Structured test questionnaire as Performance-Based Development System Model (PBDSM) was designed to assess developed critical thinking in clinical decision-making among student nurses by written test with clinical scenarios. PBDSM Numerical Scoring Framework using a 4-point -type scale with total score range of 5-8 (poor/minimal), 9-12 (moderate/developing), 13-16 (proficient/safe) and 17-20 (excellent) which correspond to levels 1, 2, 3 and 4 respectively.

Method of data collection: Researcher administered pretest to both group. Delivered lecture on anaemia in pregnancy to lecture group and gave the group posttest. For case-based learning group, after pretest, researcher carried out teaching on anaemia in pregnancy using framework for teaching. Posttest was given. Pretest and posttest were structured test questionnaires on Anaemia in pregnancy to both groups.

Data Analysis: The data were analysed using percentages and student t-tests to compare mean critical thinking in clinical decision-making scores between the two groups. Data were presented on figure and table.

Ethical Considerations: Ethical approval was gotten from Kampala International University Research ethics committee with REC number KIU-2024-424 and permission obtained from students with informed consent to carry out this study. Researcher observed ethical principles during the study.

Results

Sociodemographic Characteristics of the Case-based learning Group Participants

According to Table 1, the mean age of the CBL participants was 25.61±5.61, the majority (82.1%) of the participants were within the age of 22-27 years, 7.1% were within 28-32 years while the rest of the participants shared equal percentages (3.6%) among the remaining age groups (33-37 years; 38-42 years; 43-47 years). More than half (53.6%) were in class 4.1, while the rest (46.4%) were in class 3.2.

Above half (53.6%) of the participants were female's while 46.4% were males. A higher percentage (92.9%) of the participants were single while just 7.1% were married. It was observed that majority (75.0%) of the participants preferred lecturing as the form of teaching method for the pre-test, 21.4% preferred CBL, and only 3.6% chose demonstration as their preferred form of teaching method.

Higher percentage (53.6%) of the participants also preferred lecturing as the post-test teaching method, followed by

42.9% who preferred CBL and only 3.6% preferred discussion as their preferred teaching method.

Pre and Post Test Scores of the CBL Group Participants

Figure 1 illustrated pretest and posttest scores of CBL group using PBDSM to show the levels of critical thinking in clinical decision making of participants. Pretest scores reported 13 (46.4%) of participants were proficient/safe (level 3), 12 (42.9%) had moderate/developing (level 2) while 3 (10.7%) scaled minimal / unsafe (level 1). Posttest scores revealed 13 (46.4%) respondents at excellent point (level 4), 13 (46.4%) were proficient/safe (level 3) and 2 (7.1%) had moderate/developing (level 2) on PBDSM.

Table 1: Sociodemographic Characteristics of the Case-based Learning Group

Variables	Frequency	Percentage
Age (25.61±5.61)		
22-27 years	23	82.1
28-32 years	2	7.1
33-37 years	1	3.6
38-42 years	1	3.6
43-47 years	1	3.6
Total	28	100.0
Class		
3.2	13	46.4
4.1	15	53.6
Total	28	100.0
Gender		
Male	13	46.4
Female	15	53.6
Total	28	100.0
Marital Status		
Single	26	92.9
Married	2	7.1
Total	28	100.0
Pre-Test Preferred Teaching Method		
Case-based learning	6	21.4
Lecturing	21	75.0
Demonstration	1	3.6
Total	28	100.0
Post-Test Preferred Teaching Method		
Case-based learning	12	42.9
Lecturing	15	53.6
Discussion	1	3.6
Total	28	100.0

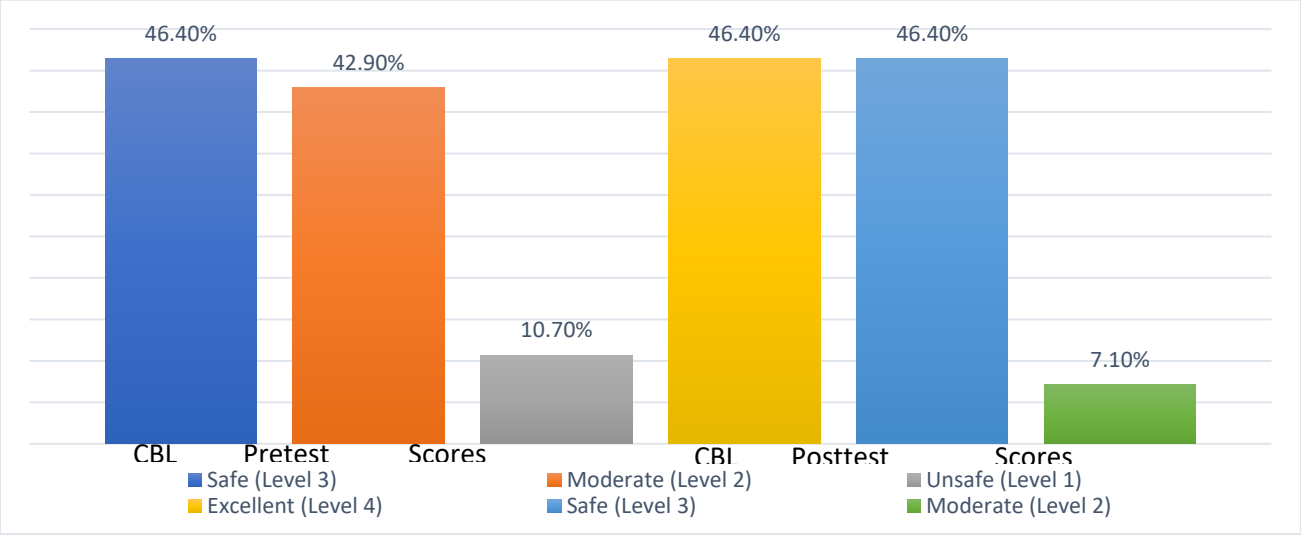

Figure 1: Pre and Posttest Scores of Case-based Learning (CBL) group showing percentages of participants using the Performance-Based Development System Model.

Sociodemographic Characteristics of the Lecturing Group Participants

The mean age of the respondents was 26.93±3.94 according to Table 2. About 46.7% of the participants were within the age range of 46.7%, 20.0% were within 26-29 years, and 33.3% were within the age group of 30-34 years. All (100.0) the control group participants were in class 3.1%. Little above half (53.3%) of the control group participants were females, while the rest (46.7%) were males. Majority (73.3%) of the participants were single, while 26.7% were married. Higher percentage (73.3%) of the participants preferred lecturing for their pre-test teaching method, while 20.0% preferred case-based learning method and few (6.7%) preferred demonstrations as their form of teaching method. Above half (53.3%) of the participants preferred case-based learning for their post-test teaching method, 46.7% preferred lecturing as their preferred post-test teaching method.

Pre and Post Test Scores of the Lecturing Group Participants

From figure 2, pretest scores of Lecture method group scaled 7(46.67%) of participants at point of proficient/safe (level 3) while 8 (53.33%) had moderate/developing (level 2). Posttest scores reported majority of participants 9 (60%) were proficient/safe (level 3) and 3 (20%) had excellent (level 4) as well as moderate/developing (level 2) respectively in PBDSM.

Table 2: Sociodemographic Characteristics of the Lecturing Group Participants

Variables	Frequency	Percentage
Age (26.93±3.94)		
22-25 years	7	**46.7**
26-29 years	3	**20.0**
30-34 years	5	**33.3**
Total	15	**100.0**
Class		
3.1	15	**100.0**
Total	15	**100.0**
Gender		
Male	7	**46.7**
Female	8	**53.3**
Total	15	**100.0**
Marital Status		
Single	11	**73.3**
Married	4	**26.7**
Total	15	**100.0**
Pre-Test Preferred Teaching Method		
Case-based learning	3	**20.0**
Lecturing	11	**73.3**
Demonstration	1	**6.7**
Total	15	**100.0**
Post-Test Preferred Teaching Method		
Case-based learning	8	**53.3**
Lecturing	7	**46.7**
Total	15	**100.0**

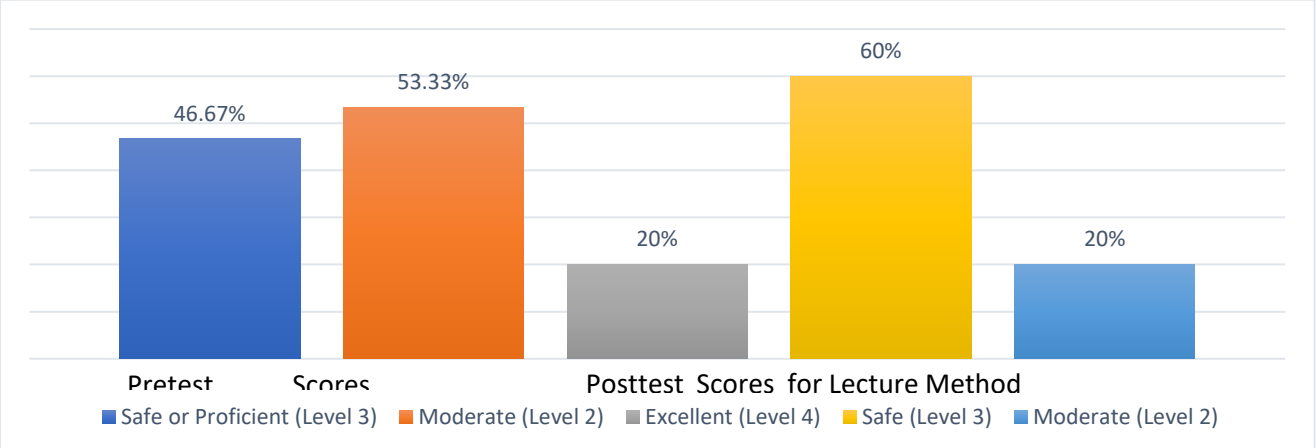

Figure 2: Pre and Post-tests Scores of Lecture Method group showing percentages of participants using Performance-Based Development System Model.

Participants Mean Test Distribution Characteristics

As seen on Table 3, the mean CBL group pre-test scores were found to be 11.75 ± 2.53 with a strong statistically significant level of 0.000. Their mean post-test scores were also significant with a mean value of 16.10 ± 72.08. For the lecturing group pre-test score, the mean was 12.27 ± 1.44 and strongly significant while their mean post-test was 14.00 ± 2.75 with a statistically significant level of 0.000.

Table 3: Participants Mean Test Distribution Characteristics

						95% Confidence Interval of the Difference	
Variables	**N**	**t**	**df**	**Significance**	**Mean ± SD**	**Lower**	**Upper**
Case-based learning Group Pre-test Score	28	24.545	27	0.000	11.75 ± 2.53	10.77	**12.73**
Case-based learning Group Post-test Score	28	41.000	27	0.000	16.10 ± 72.08	15.30	**16.91**
Lecturing Group Pre-test Score	15	33.047	14	0.000	12.27 ± 1.44	11.47	**13.06**
Lecturing Group Post-test Score	15	19.705	14	0.000	14.00 ± 2.75	12.48	**15.52**

Discussion

From the study, the mean CBL group pretest scores were 11.75 ± 2.53 with a strong statistically significant level of 0.000 and post-test scores were also significant with a mean value of 16.10 ± 72.08. For the lecture method group pretest score, the mean was 12.27 ± 1.44 and strongly significant while their mean post-test was 14.00 ± 2.75 with a statistically significant level of 0.000. This showed that CBL enhances student nurses understanding as a pedagogy than lecture method. The findings agreed with work of Ahmady and Shahbazi (2020) which revealed mean scores (9.98) of CBL group and lecture method group (10.25)in pretest while posttest were (14.36 as well as 10.72) respectively on critical thinking. Also, decision making mean scores (13.72) of CBL group and lecturing group (13.63) in pretest while posttest were (18.35 as well as 14.05) accordingly indicating enhanced critical thinking, and decision-making skills. Hamideh *et al.,* (2021) supported the above findings in a study to evaluate critical thinking on clinical decision-making of nurses that revealed a total mean score of nurses' clinical decision-making pretest in the intervention group (141.59) and control group (148.56). Posttest mean score of nurses'clinical decision-making in the intervention group (163.82) showing a weighty increase likened to a score of 154.50 in the control group. The above results indicates CBL facilitates critical thinking in clinical decision making of student nurses.

More so, case-based experimental learning (CBEL) approach by Rezaee *et. al.,* (2022) does not support the above findings. It reported a decrease in post-test mean score in nutrition courses using problem-solving inventory; problem-solving confidence (39.64), approach-avoidance style (58.98) as well as personal control (18.57) accordingly in pretest mean score and decrease in posttest meanscore of (33.39, 47.47,14.16) respectively while scientific test for academic performance after training improved from 47.89 to 81.32 (P < 0.001).Study indicated case-based experimental learning(CBEL) approach enhances student nurses ability to solve learning problems, academic performanceas well as to face clinical problems in practice while demonstrating poor nursing skills performance.

Also, CBL group showed participant's level of critical thinking in clinical decision making was levels 1 to 3 in pretest with majority 13 (46.4%) of participants at proficient/safe (level 3) and levels 2 to 4 in posttest as highest participants 13 (46.4%) at excellent point (level 4) and 13 (46.4%) were proficient/safe (level 3) in PBDSM. For lecture method group, participants were graded at levels 2 to 3 in pretest, highest 7(46.67%) of participants at point of proficient/safe (level 3). Posttest reported levels 2 to 4 with majority of participants 9 (60%) at proficient/safe (level 3) using PBDSM. There was no study to discuss this findings.

Conclusion

Critical thinking is a vital skill for nursing students, especially in clinical decision-making, where patient results hinge on precise, evidence-based assessments. This research assessed the degree of critical thinking in nursing students at Kampala International University (KIU), emphasizing both positive aspects and opportunities for enhancement. The results indicated that most students show average critical thinking skills, yet notable deficiencies remain, especially among those in the initial years of their education. Elements like academic advancement, practical experience, and instructional strategies impact the growth of critical thinking. Students who had greater clinical experience and utilized simulation-based learning tended to show enhanced critical thinking abilities. Nevertheless, issues like dependence on memorization, inadequate mentorship during clinical rotations, and a lack of problem-solving activities in the curriculum obstruct the steady enhancement of these skills, which must be tackled through a comprehensive strategy.

Recommendations

Curriculum Reforms: Integrate additional simulation-driven and case-oriented learning to present practical situations that improve critical thinking. Incorporate Critical Thinking Components; Add specific courses focusing on critical thinking and clinical reasoning within the nursing program. Instruct on evidence-based decision-making as an essential skill, highlighting its use in various clinical situations.

Clinical Mentorship: Enhance mentorship initiatives to assist students in utilizing critical thinking throughout clinical placements. Provide additional time for students to acquire practical skills in clinical environments. Shift students through different specialties (e.g., pediatrics, surgery, psychiatry) to familiarize them with various decision-making environments.

Reflective Practice: Motivate students to participate in reflective journaling to evaluate and gain insights from clinical experiences. Conduct reflective practice sessions for students to evaluate their clinical choices, learn from errors, and explore different strategies.

Targeted Interventions: Create targeted programs to assist students with diminished critical thinking abilities, especially during their formative years. Employ simulation labs to generate authentic clinical situations where students can develop critical thinking and decision-making skills in a regulated setting. Create situations that prompt students to assess, critique, and deduce, improving their abilities to solve problems. Create classroom tasks and assignments based on actual clinical scenarios that necessitate critical thinking. Foster cooperative learning, allowing students to engage in discussions and debates on various methods of patient care.

Adopt E-Learning Platforms: by offering access to digital resources, analytical thinking tools, and case study repositories. Organize debates, quizzes, and case study competitions to encourage students to engage in critical and creative thinking. Include questions that promote critical thinking in tests and practical evaluations.

References

1) Abu, A., Ayed, A., Toqan D., Albashtawy, M., Salameh, B., Sarhan, A. and Batran, A. (2023), The Factors

influencing Nurses' Clinical Decision-Making in Emergency Department. *Inquiry*.60:469580231152080.

2) Ahmady, S., & Shahbazi, S. (2020). Impact of social problem-solving training on critical thinking and decision making of nursing students. *BMC nursing*, *19*, 94.

3) Ahmed, A. and Ahmad, N. (2017) Comparative analysis of rote learning on high and low achievers in graduate and undergraduate programs, *Journal of Education and EducationalDevelopment*. **4**(1); 111-129.

4) Albutt, K., Yorlets, R. R., Punchak, M., Kayima, P., Namanya, D. B., Anderson, G. A. and Shrime, M. G. (2018). You pray to your God: A qualitative analysis of challenges in the provision of safe, timely, and affordable surgical care in Uganda. *PloS one*, **13**(4), e0195986.

5) Al-Harahsheh, S., White, D., Ali, A. M., Schnurman, D., El Araybi, C. & Al-Mutawa, M. N. (2020). Nursing and midwifery workforce development. World Innovation Summit for Health and Qatar Foundation, *Policy Briefing*.

6) Almulla, M. A. and Al-Rahmi, W. M. (2023). Integrated social cognitive theory with learning input factors: the effects of problem-solving skills and critical thinking skills on learning performance sustainability. *Sustainability,* **15**(5): 3978.

7) Anna, C., Graan, V., Martha J.S., Williams, M., and Koen, P., (2016). Professional nurses' understanding of clinical judgement: A contextual inquiry, Health SA *Gesondheid, Vo*lume 21, 2016, Pages 280-293.

8) Asna N., Krisna Y., and Nuraini T., (2021) Nurses' critical thinking and clinical decision-making abilitiesare correlated with the quality of nursing handover, *Enfermería Clínica*, Volume 31, Supplement 2, Pages S271-S275.

9) Chacon, J. A., and Janssen, H. (2021). Teaching critical thinking and problem-solving skills to healthcare professionals. Medical Science Educator, 31(1), 235-239.

10) Connor, J., Flenady, T., Massey, D., and Dwyer, T. (2023). Clinical judgement in nursing - An evolutionary concept analysis. *Journal of clinical nursing*, *32*(13-14), 3328–3340.

11) David, H. (2017). Critical thinking as an educational ideal. Retrieved from https://www.researchgate.net publication/315852948_Critical_Thinking_ as_an_Educational_Ide

12) Facione, P. A. et al (2023), "Critical Thinking: A Statement of Expert Consensus for Purposes of Educational Assessment and Instruction Research Findings and Recommendations." ERIC, Institute of Education Sciences, 1990, pp.1- 112, eric.ed.gov/?id=ED315423

13) Gosner,W.(2024).critical thinking. *Encyclopedia Britannica*. https://www.britannica.com/topic/critical-thinking

14) Hafiz, A. M., Senturk, E., Teker, C. and Sarikaya, O. (2023). Factors Affecting the Level of Reflective Thinking and Clinical Decision-Making Skills in Medical Faculty Students. *Sisli Etfal Hastanesi tip bulteni*, *57*(4), 543–551.

15) Hamideh, J, Simin, J, Marziyeh, A, Asaad, S .and Habib, H. (2021), The impact of critical thinking training using critical thinking cards on clinical decision-making of CCU nurses.*Journal of Family Medicine and Primary Care* **10**(10): 3650-3656,

16) Heard, J., Scoular, C., Duckworth, D., Ramalingam, D. and Teo, I. (2020). Critical thinking: Skill development framework. *Australian Council for Educational Research.*

17) Henk G. S., Stephanie L. W., Guus A. C., Lianne M. K., and Henk T. M., (2015). On the Use and Misuse of Lectures in Higher Education, Health Professions Education, Volume 1, Issue 1, Pages 12-18,

18) Homberg, A., Oberhauser, H., and Kaap-Fröhlich, S. (2019). Clinical reasoning - an approach for decision-making in education and training for biomedical scientists, GMS *J Med Educ.***36**(6):Doc81.

19) Hundial H. (2020) The Safe Care Framework: A practical tool for critical thinking, *Nurse Education in Practice*, Volume 48, 102852.

20) Lai, J. H., Cheng, K. H., Wu, Y. J., and Lin, C. C. (2022). Assessing clinical reasoning ability in fourth-year medical students via an integrative group history-taking with an individual reasoning activity. *BMC medical education*, *22*(1), 573.

21) Liu, F., Wang, X., and Izadpanah, S. (2023). The comparison of the efficiency of the lecture method and flipped classroom instruction method on EFL students' academic passion and responsibility. *Sage Open*, *13*(2).

22) Lowe, R. C., and Borkan, S. C. (2021). Effective medical lecturing: Practice becomes theory: A narrative review. *Medical science educator*, *31*(2), 935–943.

23) Makhene A. (2022). Use of Foundational Knowledge as a Basis to Facilitate Critical Thinking: Nurse Educators' Perceptions. *Nursing research and practice*, *2022*, 3736322.

24) McCarthy, V. P., LeRoy, B. S., Callanan, N. P., McCarthy Veach, P., LeRoy, B. S. and Callanan, N. P. (2018). Collaborating with patients: providing information and facilitating patient decision-making. facilitating the genetic counseling process: Practice-Based Skills, 173-213.

25) McLean, S.F (2016). Case-based learning and its application in medical and health-care fields: a review of worldwide literature. *J Med Educ Curric Dev*. 27;3: J MECD.S20377.

26) Meraji, M., Mahmoodian, S., and Houshmand, E. (2016), The effect of concept map on education: A systematic review Iranian Journal of Medical Education. **16** (2): 83–97 Nibbelink, C.W and Brewer, B.B (2018). Decision-making in nursing practice: An integrative literature review. *J Clin Nurs*. **27**(5-6):917-928.

27) Obeagu G.U., Marudhar, Turkur M. (2024) A review on impact of case-based learning on critical thinking in

clinical decision making in nursing education. *Lifeline Education,* 2(1): 57-63.

28) O'Donovan, R. and McAuliffe, E. (2020). A systematic review exploring the content and outcomes of interventions to improve psychological safety, speaking up and voice behaviour.*BMC health services research*, **20**(1):1-11.
29) Rababa M., and Al-Rawashdeh S. (2021) Critical care nurses' critical thinking and decision making related to pain management. *Intensive and Critical Care Nursing*, Volume 63,103000,
30) Rezaee R, Haveshki F, Barati-Boldaji R, Mehrabi M. (2022) The effect of case-based e-learning on academic performance and problem-solving ability in nursing students: A pre- and post-test study. *J Educ Health Promot*. 11:302. doi: 10.4103/jehp.jehp_1613_21.
31) Risling, T. (2017). Educating the nurses of 2025: Technology trends of the next decade. *Nurse education in practice*, **22**: 89-92.
32) Roshangar, F., Azar, E. F., Sarbakhsh, P. and Azarmi, R. (2020). The effect of case-based learning with or without conceptual mapping method on critical thinking and academic self- efficacy of nursing students. Journal of Biochemical Technology, 11(1), 37.
33) Ryan, E. (2023). What is critical thinking? | definition & examples. *Scribbr*. Retrieved March 1, 2024, from https://www.scribbr.com/working-with-sources/critical-thinking/
34) Saab, M. M., Hegarty, J., Murphy, D. and Landers, M. (2021). Incorporating virtual reality in nurse education: a qualitative study of nursing students' perspectives. *Nurse EducationToday*, **105**: 105045.
35) Sapeni, M. A. A. R. and Said, S. (2020). The effectiveness of case-based learning in increasing critical thinking of nursing students: A literature review. *Enfermería Clínica*, **30**: 182-185.
36) Telfer, M., Zaslow, R., Nabirye, R. C. & Mbalinda, S. N. (2021). Review of midwifery education in Uganda: Toward a framework for integrated learning and midwifery model of care.*Midwifery,* **103**:103145.
37) Turkson-Ocran R.N., Nkimbeng M., Erol D., Hwang D.A., Aryitey A.A., and Hughes V. (2022) Strategies for Providing Culturally Sensitive Care to Diverse Populations. *J Christ Nurs*. **39**(1):16-21.
38) Van Nguyen, T., and Liu, H. E. (2021). Factors associated with the critical thinking ability of professional nurses: A cross-sectional study. *Nursing open*, *8*(4), 1970–1980.
39) Zavala, A. M., Day, G. E., Plummer, D., and Bamford-Wade, A. (2018). Decision-making under pressure: medical errors in uncertain and dynamic environments. *Australian health review : a publication of the Australian Hospital Association*, *42*(4), 395–402.