

ENHANCING CLINICAL REASONING SKILLS USING THE SNAPPS MODEL AMONG NURSING STUDENTS THROUGH EVIDENCE-BASED PRACTICE (EBP)

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ABSTRACT

Background: Clinical reasoning is an essential competency for nursing students, enabling them to interpret patient information, prioritize clinical problems, make informed decisions, and provide safe, evidence-based care. Conventional teaching approaches may emphasize knowledge acquisition rather than active clinical reasoning and reflective decision-making. The SNAPPS (Summarize, Narrow, Analyze, Probe, Plan, and Select) model provides a structured, learner-centered approach to case presentation that promotes active participation, analytical thinking, questioning, and reflection. Integrating SNAPPS within an Evidence-Based Practice (EBP) framework may help bridge the gap between theoretical knowledge and clinical application.

Aim/Objectives: To evaluate the effectiveness of the SNAPPS model in enhancing clinical reasoning skills among undergraduate Nursing students during clinical case presentations.

Methodology: A pretest–posttest educational intervention project was conducted among eight sixth-semester BSN students at Reflex College of Nursing. The project focused on mental health nursing topics, including schizophrenia, anxiety, and personality disorders. A self-developed rubric based on the SNAPPS model was used to assess students' case-presentation and clinical reasoning skills. Following a baseline assessment, students participated in structured SNAPPS-based case presentations over two consecutive weeks. Each session lasted approximately 45 minutes. A post-intervention assessment was conducted in the fourth week using the same assessment rubric. Pretest and posttest scores were compared using a paired-samples t-test.

Results: The mean pretest score was 16.75 ± 4.234 , which increased to 20.75 ± 2.765 following the intervention, representing a mean improvement of 4.00 points. The paired-samples t-test demonstrated a statistically significant improvement in posttest scores ($t = -4.989$, $df = 7$, $p = 0.002$). The 95% confidence interval for the pretest–posttest mean difference ranged from -5.896 to -2.104 . The reduction in standard deviation from pretest to posttest also indicated greater consistency in students' performance following implementation of the SNAPPS model.

Introduction

EBP is a problem-solving approach to clinical decision-making within a healthcare organization. EBP integrates the best available scientific evidence with the best available experiential (patient and practitioner) evidence.(Dearholt & Dang, 2012).Evidence-based practice (EBP) combines clinical expertise with the best available evidence to improve patient outcomes and ensure high-quality care(Melnyk & Fineout-Overholt, 2022).To meet the needs of the modern healthcare system, the Institute of Medicine (IOM), now the National Academy of Medicine, published a set of five core competencies required of each health professional. These competencies included providing patient-centered care, working in interdisciplinary teams, applying quality

improvement, utilizing informatics, and employing evidence-based practice(Greiner & Education, 2003) EBP is a crucial framework for fostering clinical reasoning skills and clinical decision-making among students in nursing education. The Johns Hopkins Evidence-Based Practice Model (JHEBP) for Nursing and Healthcare Professionals provides a structured and systematic way for clinicians to effectively use current research and nonresearched evidence to determine best practices and provide safe, high-quality care. (Dang et al., 2021). The revised Johns Hopkins Evidence-Based Practice (JHEBP) Model for Nurses and HCPs is composed of three interrelated components— inquiry, practice, and learning—that take place in the context of interprofessional collaborative practice.

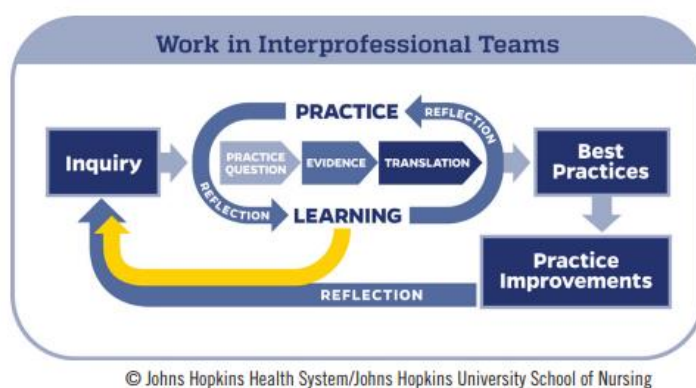
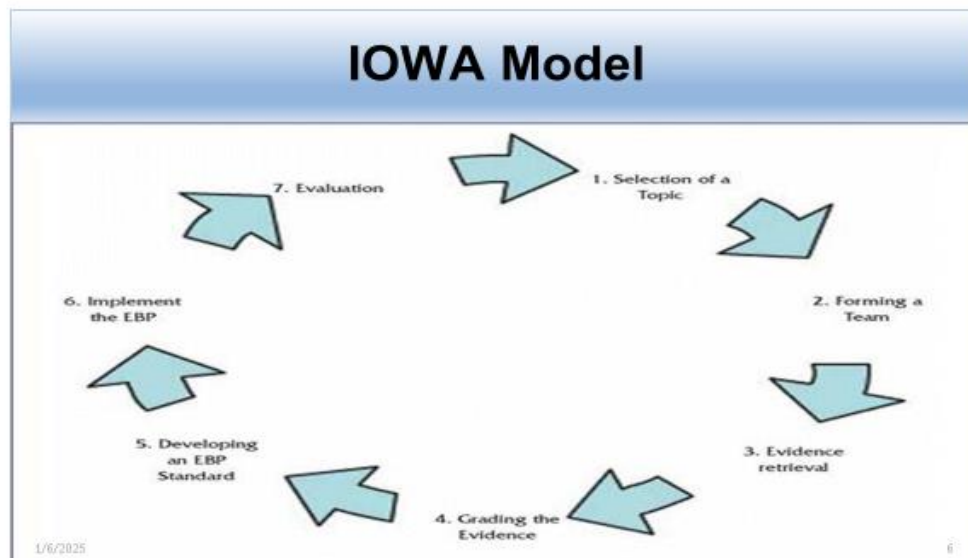


Figure 3.1 The Johns Hopkins Evidence-Based Practice Model for Nurses and HCPs (2020).

The IOWA Model was developed at the University of Iowa Hospitals and Clinics in the 1990s to guide nurses in using research findings to improve patient care. The model was developed as a pathway or method to EBP—a method to guide the steps to identify issues, research solutions, and implement changes.

EBP steps related to applying evidence to make care decisions:

1. Identifying an issue or opportunity,
2. Forming a team,
3. Evidence retrieval,
4. Grading the body of evidence,
5. Developing an EBP standard
6. Implement the EBP, and
7. Evaluation.



Clinical reasoning is the professional skill and knowledge to collect and analyze patient data, evaluate their significance, identify actual and potential patient problems, and find the best measures to manage the identified issues and improve patient outcomes (Benner, 2012). Clinical reasoning enables nursing students to analyze complex situations, prioritize care, and deliver safe and effective interventions (Facione, 2011).

SNAPPS is a technique for case presentation (Sawanyawisuth et al., 2015). The steps in the SNAPPS technique are drawn from the cognitive rating scale developed by (Collins, 2013). The SNAPPS model (**Summarize, Narrow, Analyze, Probe, Plan, and Select**) is an interactive teaching strategy designed to enhance clinical reasoning. It encourages learners to actively engage in case discussions, ask questions, and reflect on their clinical decisions, bridging the gap between theoretical knowledge and practical application (T. M. Wolpaw et al., 2003). By promoting structured case presentations and fostering analytical skills, SNAPPS has been shown to improve the confidence and competence of nursing students in clinical settings (Jain et al., 2019). Implementing this model within an EBP framework can significantly enhance the clinical reasoning skills abilities of BSN students, preparing them for real-world clinical challenges.

NEED ASSESSMENT:

Identification of the problem

Clinical reasoning is a crucial skill for nursing students, enabling them to make informed decisions in patient care. Traditional teaching methods often focus on rote memorization rather than developing clinical reasoning and decision-making abilities.

Prioritization of the problem

Nursing students often struggle with critical thinking and clinical reasoning skills, leading to a gap between theoretical knowledge and clinical practice. This gap can result in delayed decision-making, decreased patient safety, and reduced clinical competence. Strong clinical reasoning is essential as it enables students to process information, prioritize patient care, and adapt to rapidly changing clinical environments. Effective educational strategies, such as structured case discussions have been shown to improve clinical reasoning and bridge the gap between theory and practice. Addressing this issue is essential for preparing nursing students to meet the complexities of modern healthcare.

Justification of the problem

Clinical reasoning skills enhance patient safety, improve decision-making, and prepare students for real-world challenges. The SNAPPS model provides a structured framework for clinical discussions, fostering deeper understanding and analysis. By encouraging learners to summarize clinical cases, narrow differential

diagnoses, and analyze findings, SNAPPS promotes active engagement and critical thinking. This model also encourages probing questions and reflective planning, which are essential for developing clinical judgment. Furthermore, evidence suggests that structured teaching models like SNAPPS improve learner confidence and facilitate the integration of theoretical knowledge into clinical practice. Implementing this model can address gaps in nursing education, ultimately improving patient outcomes and professional competence.

Current teaching methodology

Current teaching methods, such as traditional case discussions, lack the interactive and reflective elements needed to build clinical reasoning skills. Students often passively absorb information without engaging in problem-solving or inquiry. Traditional lectures and case reviews do not encourage students to critically evaluate data, prioritize care, or make evidence-based decisions. Moreover, these methods fail to simulate the dynamic and unpredictable nature of real clinical environments, leaving students underprepared for actual patient care scenarios. Research suggests that incorporating active learning strategies, such as simulation, role-playing, and case-based learning, can significantly enhance clinical reasoning and better prepare students for clinical challenges. Therefore, transitioning to more interactive and reflective teaching methodologies is imperative to bridge the gap between knowledge and practice.

PICOT Questions

The PICOT framework is a vital tool in Evidence-Based Practice (EBP) that helps formulate focused clinical questions and guide research and practice improvements. It stands for Population/Patient Problem, Intervention, Comparison, Outcome, and Time (Melnik & Fineout-Overholt, 2022). By using this structured approach, healthcare professionals can identify specific elements of a clinical issue and develop targeted strategies to address it (Riva et al., 2012). In this project, the PICOT question focuses on evaluating the impact of the SNAPPS model on enhancing clinical reasoning skills among BSN nursing students

P: BSN 6th-semester students in a clinical practicum

I: Use of the SNAPPS model in case presentations

C: Traditional teaching methods (lectures or unstructured case discussions)

O: Improved clinical reasoning as measured by pre- and post-intervention assessments

T: 4 weeks

Purpose of the Project

This project aimed to evaluate the effectiveness of the SNAPPS model in enhancing clinical reasoning skills among BSN nursing students. This project provided valuable insights into the role of structured teaching methods in bridging the gap between theoretical knowledge and clinical application, ultimately contributing to improved patient outcomes and nursing education quality.

Relate the problem/need to an educational theory

The SNAPPS model aligns closely with Vygotsky's Social Constructivism, which emphasizes that learning is an active, social process where students construct knowledge through interaction and guided support (Vygotsky, 1978). In clinical education, the SNAPPS model fosters learner-centered engagement by requiring students to analyze patient cases, generate differential diagnoses, and articulate their reasoning while receiving faculty guidance and feedback. This approach reflects Vygotsky's Zone of Proximal Development (ZPD), which posits that learners develop higher-order thinking skills when supported by a more knowledgeable mentor (Vygotsky, 1978). The structured yet flexible nature of SNAPPS allows students to engage in scaffolder learning, where instructors provide targeted assistance to bridge gaps in knowledge, gradually encouraging independent clinical reasoning. Research supports that active learning methods, such as SNAPPS, enhance critical thinking, diagnostic accuracy, and clinical decision-making among medical and nursing students (Jain et al., 2019). By fostering interactive learning, reflection, and guided problem-solving, the SNAPPS model exemplifies Vygotskian principles, reinforcing

its effectiveness in nursing education and evidence-based practice.

Review of evidence-based literature

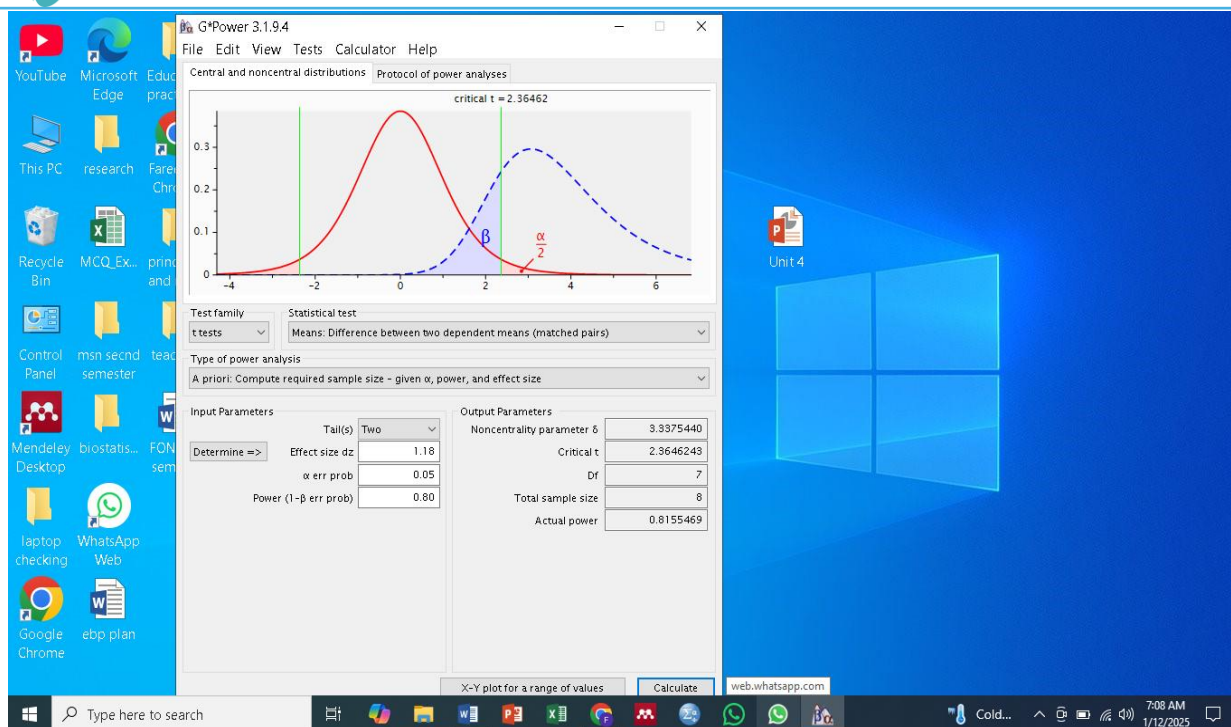
The effectiveness of SNAPPS has been widely studied in medical and nursing education. A study by (T. M. Wolpaw et al., 2003) found that SNAPPS-trained students demonstrated better diagnostic reasoning and higher engagement in reflective learning compared to those using traditional case presentations i.e. (1.26 versus 0.22 and 0.23, $P < .000$). Another study by (T. Wolpaw et al., 2009) concluded that students using SNAPPS technique justify patients' management plan more often than the comparison groups (84.84% versus 56.72% and 53.66%). Similarly, research conducted by (Seki et al., 2016) in a meta-analysis of randomized controlled trials (RCTs) confirmed that the model significantly improved self-directed learning and problem-solving abilities. Another study (Sawanyawisuth et al., 2015) also observed improvement in case presentation of fifth-year medical students with $p = 0.003$ when compared SNAPPS users with traditional teaching method users. (Heinerichs et al., 2013) also reported that students showed marked improvement in their posttest score with SNAPPS from baseline with p value. Compared to traditional case presentations, SNAPPS is found to be superior in promoting active learning and clinical reasoning. Traditional methods often involve one-way knowledge transmission, where students passively listen to case discussions (Linn et al.,

2012). In contrast, SNAPPS requires students to actively engage, summarize patient cases, generate differential diagnoses, and express clinical uncertainties. This structured yet flexible format makes SNAPPS more effective in nurturing independent clinical judgment and critical reflection, essential for nursing practice (Eva, 2005). A randomized controlled trial (RCT) at Peshawar Medical College assessed the effectiveness of SNAPPS among final-year undergraduate medical students compared to traditional teaching methods and the One-Minute Preceptor (OMP) model (Ali et al., 2018). The results showed that SNAPPS-trained students exhibited higher post-test scores in clinical reasoning than their peers in the OMP or traditional teaching groups.

Methodology

Setting, Population, and Tool: This project was conducted with 6th-semester BSN students at REFLEX COLLEGE OF NURSING, focusing on mental health nursing topics such as schizophrenia, anxiety, and personality disorders. Sessions were held in the classroom. Tools included a checklist for evaluation of case presentation according to the SNAPPS model.

Sample size The required sample size for this project, given an effect size of **1.18 from previous data**, a significance level of **0.05**, and a power of **0.80**, is approximately **8 participants**.



Project Plan

The sessions were conducted over three consecutive weeks, with each session lasting 45 minutes. The intervention utilized the SNAPPS model for case presentations, following a structured checklist. In the first week the lecture method was used with a PowerPoint slide presentation. Before the intervention the purpose of the study was explained and informed consent was taken from all participants. pre-assessment was conducted using a self-designed rubric for case presentation (Appendix B). During Weeks 2 and 3, students engaged in weekly SNAPPS-based case presentations, applying the model in a structured manner and after individual work on the case, they presented the case using the SNAPPS technique. In Week 4, a post-intervention assessment was conducted using the same self-designed rubrics to evaluate changes in clinical reasoning skills.

Data Collection and Assessment

A self-developed rubrics was filled out after obtaining consent from the participants. During **Weeks 2 and 3**, students engaged in **weekly SNAPPS-based case presentations**, applying the model in a structured manner and after individual work on the case, they presented the case using the SNAPPS technique. After the intervention the

participant was again assessed using the same tool.

Data Analysis

A paired samples t-test was conducted to compare the pretest and post-test scores to determine whether the intervention led to a significant improvement. The results showed that the mean pre-test score was 16.75 (SD = 4.234), while the mean post-test score was 20.75 (SD = 2.765), indicating an average increase of 4 points. The mean difference between the two tests was -4.000 (SD = 2.268), with a 95% confidence interval ranging from -5.896 to -2.104, suggesting that the true difference in means falls within this range. The t-value was -4.989, with 7 degrees of freedom (df = 7), and the p-value was 0.002, which is statistically significant at $p < 0.05$. These results indicate that the intervention had a meaningful impact on improving post-test scores. Furthermore, the decrease in standard deviation from pretest to posttest suggests that scores became more consistent after the intervention. Given the statistical significance and practical implications, the improvement in scores indicates that these findings support the effectiveness of the intervention in enhancing performance.

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 pretest	16.75	8	4.234	1.497
posttest	20.75	8	2.765	.977

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pretest posttest	-4.000	2.268	.802	-5.896	-2.104	-4.989	7	.002

Recommendation

The intervention demonstrated significant effectiveness in improving learning outcomes. It is recommended for broader implementation and further validation. Future studies should assess its long-term impact and explore customization for diverse learning styles.

Conclusion

This study found that the intervention significantly improved learning outcomes, as reflected in the higher posttest scores compared to pretest scores ($p = 0.002$). The mean increase of 4 points confirms its effectiveness in enhancing understanding and retention. Additionally, reduced score variability suggests more consistent performance among participants. These findings support the intervention's potential for wider application in educational settings to improve learning and clinical reasoning skills.

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